

School of Education

**Science, Education and Social Vision of Five
Nineteenth Century Headmasters**

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ABSTRACT

The study investigates how science was used by five nineteenth-century headmasters at a time when the Church of England fought to maintain its historical control of elementary education and its associated Grammar schools resisted attempts to include science in their elementary or secondary curricula; when long hours in mills precluded poor children from education; when class attitudes biased Government enquiries into education and industrial training. It was a time when belief in laissez-faire economics conflicted with the exercise of moral judgements. The headmasters viewed their students as individuals and sought to equip them with worldviews. Their curricula were inspired by their visions for society. They used science, scientific method and practical learning. They liberated subjects from traditional boundaries to provide students with comprehensive understanding of areas of knowledge. They emphasised student self-learning and provided the facilities for it. There were similarities in their radical objectives and methods. They effectively interacted with local communities. Their methods mostly did not survive their school tenures but offer challenging thoughts for science teaching today.

Key words: Science education; social positioning; nineteenth century.

DEDICATION

I gratefully remember my parents' deep contribution to my education.

In loving memory of Mrs. Ellen Bottomley (née Foxcroft), 1881-1969

and

Rev. William Bottomley, 1882-1966.

PERSONAL INTEREST IN THIS RESEARCH

This study connects me with my Lancashire and Yorkshire parents and grandparents. In the first half of the nineteenth century the County of Lancaster with its major cities of Liverpool and Manchester was a major centre of English cotton spinning, weaving and calico printing. My mother was born in the Lancashire mill town of Blackburn in 1881 and there married my father, a Yorkshireman, born in 1882. During 1889-1891 my mother attended a Girls' Continuation Class and a largely male Business Class at the Blackburn Technical College. My father was born in Burley Woodhead, Yorkshire and educated in a Methodist school in Leeds. He was variously a wool clerk in a local mill, a salesman in Wales for Singer Sewing Machines, a Methodist lay preacher and an early organiser of the Independent Labour Party. His experiences as a volunteer in the First World War turned him pacifist. For many years, he was minister of the Melbourne Unitarian Church. Of my characters, George Edmondson was born in Lancashire, attended Ackworth School near Leeds in Yorkshire and conducted schools in Blackburn during 1825-40 and in Preston during 1841-7. Kay-Shuttleworth and Edward Frankland were born in Lancashire, and it was in Lancashire that Robert Owen, a Welshman, completed his introduction to the retail and wholesale distribution of cotton goods and learnt to manage a cotton mill. As I write this study I recall fragments of my mother's descriptions of her early life in the Lancashire mill town of Blackburn where people's lives were organised by the mills' whistles and the sounds in the streets were of the workers' industrial clogs as they hurried to work.

My interest in school science curricula began in 1946 when, proudly equipped with a *B.Sc., Dip. Ed.*, I received my first appointment - as Science Master in a private boarding school in New South Wales. The school's 300 boarders were sons of farmers and graziers. They included many who apart from fear of wartime Japanese attack on Sydney or Melbourne would have been sent to capital city schools. Many expected their employment would be in managing their family properties. My laboratory, built in 1913, accommodated eight students and its old springy floor boards challenged their skills in volumetric analysis. Subject matter on the 1946 New South Wales Government syllabus gave rise to examination questions that had originated in nineteenth century English science teaching. After-school and end-of-

year, week-long, science excursions to industry with my senior students helped bridge an educational gap (Bottomley, 1947).

My question for that first study was: If the school were free of the restraints of a Government syllabus, what should I be teaching to meet the needs of those particular boys from their particular rural areas of New South Wales and Victoria that would help them to understand newspaper articles and discussions on matters related to science and which might lay some basis for further learning that would be professionally important for their likely agriculture careers? The results of the study were well received academically (Bottomley, 1948) but, if applied, would have disqualified me from teaching 40% of my curriculum for lack of formal training in the “life” sciences. In December, 1948 I was recruited to manage a small market research company in Melbourne with particular interest in the agriculture market. I have since continued for more than sixty years in social and market research in England, Australia, Myanmar, China, Hong Kong and other Asian countries, alternating my work with studies of school curricula. My second school study was a qualitative enquiry among 28 alumni of my first school, Albury Grammar School, now Scots School, Albury (Bottomley, 2006) (the school changed its name when it became co-educational in 1971). That study showed the alumni in their memories differentiated two universes; the headmaster and their broader school experience as one; teachers and the subjects they taught as the second. In their ratings of subjects they studied and the subject teachers they placed mathematics last and science, last but one. The discriminating word was “passion”. Teachers who brought “passion” to their work were well remembered. “Nothing original about that result”, teachers would say. My third study (Bottomley, 2008) dealt with the wider issue of the development of schools in Australia such as Albury Grammar School where in the 1920’s, some staff and students saw themselves attending the equivalent of a “Great Public School” of England. The overall purpose of this fourth study is a review of five nineteenth headmasters who taught science as an essential part of a “modern” education and who *used* science as a means of achieving their social visions. It is hoped that the study will raise issues for discussion and develop ideas for current social investigations in the history of science education that might usefully contribute to addressing the persistent concerns about the declining percentages of students pursuing senior school studies in science subjects; to assist students to appreciate

how science has transformed the physical conditions in which they live, the social orders of our society and their perception of their place in the world.

CONFERENCE PRESENTATIONS AND PUBLICATIONS

In developing the material and testing the method for this study the writer has presented eleven papers, variously at conferences of the Australasian Science and Education Research Association (ASERA), the Australian and New Zealand History of Education Society (ANZHES), a combined meeting of ANZHES and ANME (Australian National Museum of Education), the History of Education Society (U.K.) and has one accepted for the Canadian History of Education Association 20th Biennial Conference in October, 2018.

CONFERENCES

- ANZHES, Wagga Wagga, New South Wales, November, 2010 *Student Engagement in Science: England, 1750-1850* [relates to Survey Method]
- ASERA, Adelaide, South Australia, June, 2011 *Robert Owen's Four-dimensional Curriculum, 1816-18* [relates to Chapter 8]
- ANZHES, Auckland, November, 2011: *The Priest who supported Secular Education in Church schools – Richard Dawes's Educational practice at King's Somborne. Hampshire, 1837-49* [relates to Chapter 9]
- ANZHES, Melbourne University of Technology, Victoria, November, 2012: *George Edmondson's Years before Queenwood College* [relates to Chapter 10]
- ANZHES, Queensland University of Technology, December, 2013 - *The Million Missing Children of 1851 – the first U.K. Census of Education* [relates to Chapter 3]
- *A Multi-faceted Social Instrument: the Oxford Middle-class Examinations of 1858* [relates to Chapter 5]
- *The Metempsychosis of Harmony Hall* [relates to Chapter 11]
- ASERA, Hilton on the Park, Melbourne, July, 2014 *Technology as Curriculum: the story of F. W. Sanderson at Oundle School (1892-1922)* [relates to Chapter 13]
- ANZHES, University of Melbourne, December, 2014 *Three Innovative Science Curricula – A Discussion* [relates to Chapter 9, §9.12, §9.13]
- ANZHES-ANME, Canberra University, September, 2017. *Robert Owen: the Industrial Years and World Heritage Recognition* [relates to Chapter 8]
- U.K. H0ES Conference: Winchester, October, 2017: *Quaker Headmaster George Edmondson creates an educational milestone in Hampshire: 1847-1863* [relates to Chapter 10]
- (Planned) Canadian History of Education Association 20th Biennial Conference, Fredericton, October, 2018. *A 19th Century Challenge to Present Education* [relates to Chapter 14]

PUBLICATIONS

Joseph Banks (1742-1820): The Market Researcher whose Client was the British Empire. *Australasian Journal of Market & Social Research* 20(1), June 2012 [an example of the importance of 18th century science in world affairs and in the exploration and development of Australia]

The Social Purpose of Rev. Richard Dawes who taught the Philosophy of Common Things. *History of Education Review* 43(1), November 2014 [relates to Chapter 9]
Papers are in preparation for the two conferences attended in 2017.

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Chapter 1

INTRODUCTION

1.1 Purpose and scope of study

In 1770, James Cook on his first journey to Australia annexed the eastern half of the country in the name of Britain and George III, and named it *New South Wales*. It was the luck of history that Holland and France had not earlier followed up the work of their 17th and 18th century explorers who, variously, had claimed parts of Australia for their countries. So, it was that the colonial history of Australia was British history and the structure of Australian education today owes much to happenings in Britain in the nineteenth century, even to the extent of controversial religious instruction and chaplaincy in State Government Schools which are supported by the Australian Government. Early science textbooks were English in origin and most of the older independent schools in Australia were modelled on English Grammar schools. Australia shares with many other countries problems of recruiting young scholars to science and mathematics; issues arising from national versus local curricula; the function of headmasters within Government schools.

The particular purpose of the study is to examine in their historical contexts the social positions taken by five nineteenth century British headmasters by reference to their curricular designs and ability to engage students' interest. The study points to the importance of historical contextualisation in the study of science education which may contribute to discussion of current issues in Australia.

The scope of this study is from 1760 when Joseph Priestley published an essay on modern education (Priestley, 1760) and formed his school in Nantwich, Cheshire which, according to F. W. Gibbs, he opened in about the same year with thirty boys and six girls as pupils (Gibbs, 1965). It was not co-educational as Priestley taught the girls in a separate classroom. It did include science and the use of scientific apparatus which:

he taught his top class how to use ...when parents and friends visited the school they had the novel experience of being entertained with experiments and short lectures given by the pupils themselves. (Gibbs, p.14)

In his school, Priestley also taught English, Mathematics and History, subjects he

considered appropriate for commercial careers. The school, according to Gibbs, helped to remedy Priestley's lack of teaching experience and raised money for scientific equipment he needed. We may also assume it usefully contributed to his stipend as minister of a local, doctrinally-liberal church.

The scope of the study effectively concludes in 1922 with the death of one of the five headmasters, Frederic Sanderson of Oundle. Reference is made to *The English tradition of education* (Norwood, 1929) in which Cyril Norwood, Headmaster of Harrow, called for all teachers to unite behind the ethos of the Great Public Schools, The candidate judged this a suitable 'book-end' to mark a system of education which "his" five headmasters would not or positively did not agree.

1.2 Selection of the headmasters and their schools

The selected schools were well-known for teaching science and for which considerable literature was available for study. **Richard Dawes** (*Elementary Parish school at King's Somborne, Hampshire 1842-1849*) was first selected. David Layton in Chapter 2 of his *Science for the People* (1973) gave an intriguing account of Dawes's science teaching of village children such that its selection was impelling. There was also a wealth of information available from Dawes's two books on education, his many lectures and also publications about Dawes by the Somborne and District Society of Hampshire.

Three other headmasters were selected as the information about them assembled in a previous study (Bottomley, 2008) suggested further enquiry might be worthwhile. **Robert Owen** (1816 *Institute for the Formation of Character*) directed the schools of New Lanark, Scotland during 1816-1824; **George Edmondson** (*Queenwood College, Hampshire, 1847-1863*) and its continuation under **Charles Howson Willmore** (in 1864-1896).

The fifth headmaster was **Frederick Sanderson** (at Dulwich College, 1885-1891 and at *Oundle in Northamptonshire, 1892-1922*).

1.3 Study method

History does not present itself with the ordered data available for contemporary social investigations with their many ways of constructing hypotheses, the testing of

a measuring instrument — applying a personal questionnaire or observation procedure - and evaluation according to a regularised and logically acceptable procedure. Rather, as Benedetto Croce pointed out (Croce, 1960) early in the 20th century, history is a product of the human mind, subject to all the prejudices and biases, knowledge and ignorance of the writer's mind and the patterns and social conditioning of his thinking. Secondary references represent a further hurdle. They represent someone's interpretation of an original which itself may be at fault and both primary and secondary data may be subject to avoidance or inability to accept information that does not fit the authors' preconceived notions. To attempt to write history it seems essential to apply the revolutionary, seventeenth century dictum adopted by the Royal Society of London at its foundation: *Nullius in verbis* (*Not on another's word*) not only to secondary sources but to primary: Did my main characters dissemble or avoid discussing relevant happenings?, unfairly present their arguments?, fail to judge or hide their standing within their social group?, or their social group not want to admit their hero did not support the status quo?

1.4 Background to the research

In addition to the normal scepticism involved in scientific method, in a study such as this, which precedes hypothesis formulation, it is important not to impose any hierarchy of supposed importance on what might be considered a “small” or irrelevant item.

That, for example, Tyndall when a teacher at Queenwood, in his journal refers variously to exercising on the parallel bars and exercising with lead weights drew attention to the fact Queenwood had an outside gymnasium in 1847 which demonstrated the Edmondsons' advanced thought for the health of their students, as few schools at that time had such equipment.

Student notes in the school paper, *The Queenwood Reporter*, describe the student joy when Edmondson would call for an hour of what was synchronised gymnastic running in place of the usual hour of lessons before breakfast or granted an unexpected half-holiday. Such notes indicated that Edmondson understood the importance of variety in institutional life. The 31 May 1848 meeting in Mr Edmondson's “No. 10” rooms is described and discussed in Chapter 10. The

situation described should not be overlooked in understanding Queenwood's first year as it gave further evidence of Edmondson's insecurity; illustrated inadequate understanding of discipline by staff and *gauche* behaviour by Tyndall and Frankland.

The task of writing history is complicated by the task of attempting to change the coordinates of one's current existence to those of one's historical characters. The task is further complicated by changes over time in the meanings of words.

In attempting to understand George Edmondson's impulsive behaviour with staff at Queenwood we may consider the implications of two words, "little" and "shrewd" as used by one science teacher who after visiting Queenwood decided he would not join the Queenwood staff. He referred to Edmondson as "that shrew'd little Quaker". The Shorter Oxford English Dictionary 6th Ed shows us that was not a nice nineteenth century term as a malicious person could be described as a "shrew". The candidate recalls curious behaviour between members of his business staff with unusual differences in height.

The "Lens of Biblical belief" is discussed further in the final chapter in connection with the social positioning of Richard Dawes by 20th century members of his church congregation. They wrote about his memory as if he were not a political radical in his day –the opinion expressed by the candidate. Particular awareness was required with respect to contemporary press articles about Queenwood because Edmondson operated the equivalent of a present-day "public relations" committee consisting of Mrs. Anne Edmondson, their daughter, Jane Edmondson and John Tyndall in the year and a quarter before he left Queenwood to seek his Ph.D in Germany. Tyndall did not always agree with the lady members, which upset him. He records in his journal for 24 May, 1848, "...hard frost in evening, doubtless caused by my not subscribing to the spirit of an article written for The Reporter." So, Tyndall had collected Frankland for a couple of hours drinking in "the Dog" (Greyhound Hotel) from which they returned "in a very undesirable condition." The atmosphere was even frostier at breakfast the next morning when the ladies, "dumbly indignant", refused to speak to them.

Robert Owen was, perhaps the largest advertiser in Britain in 1817. Podmore (1906) estimated that in August and September, 1817 he could have spent the enormous sum of £4,000 to buy and distribute newspapers to people we would

call “opinion leaders” with reports of his talks in which he “pushed” his political opinions (p. 238). Richard Dawes would have denied he was a propagandist though in his two books and early lectures he strongly supported his views on working class education without showing signs he was aware of the strength of opposition to them. Charles Willmore appeared to have no feeling for advertising as he made but modest use of very high level endorsements for the school when, during 1874-78, seven eminent scientists, all FRS, offered him use of their names as referees or in 1892 when William Crookes, FRS and Professor Dr. Vivian Poore, a medical adviser to the Royal Family, added their names to the list of Queenwood referees. In what might have been Queenwood’s final prospectus, in 1892, under the heading: “Opinions of Queenwood by Parents”, “William Crookes, Esq., F.R.S., F.C.S., &c., &c ” wrote:

With the greatest pleasure I give you permission to print my name as a reference or use in an advertisement of your school or in any other way which you may think likely to impress the fathers and mothers of England with the idea that Queenwood is the very best school in the Kingdom for them to send their sons to. (Queenwood School Prospectus about 1893, p.7

It is easy to imagine how Edmondson might have used such an endorsement by Crookes, said to have been the first man in London to light his home with electricity (Brock, 2004). But it was too late for Willmore to take public action, even if he were comfortable in doing so. Willmore’s Queenwood School Prospectus (undated but judging from dated endorsements from parents) was issued in 1892 or 1893. Accompanying school notes for 1892 showed that student numbers had dwindled, the structure of out-of-school activities had collapsed and Willmore was writing about the value of the *small* private school that could give individual attention to its students. Willmore closed the school in 1896.

According to H. G. Wells, Frederick Sanderson’s biographer, Sanderson did little public speaking before the First World War, but after it, in the great sorrow at the huge loss of life, including his son’s, and in the temporary period of public euphoria that a new world could be created, Sanderson readily gave public talks. On 16 February, 1920 Sanderson spoke to the Leeds Luncheon Club and in the evening at the Leeds University. [Unpublished material in the School’s archives) His theme for both talks was that the object of industry must change from profits first to workers first! Could the Governors of a school whose engineering and workshop training

appealed to sons of Midlands' manufacturers tolerate a socialist headmaster? His final objective was not put to test as he died on 15 June, 1922.

Other examples of the contribution by contemporary newspapers to the study narrative include the narrow range of Queenwood sporting opponents – not local schools but local sporting clubs - Queenwood staff participation in local self-improvement societies and village music organisations; examples of Willmore's congenial character; and a further example of Edmondson's insecurity when he sacked a teacher, F. R. Smith, of five or six years standing over a time-table dispute.

In short, the method used embraced all items of information available, small or large, important or seemingly unimportant in order to gain the understanding necessary to feel at home in any of the schools studied and easily enter into conversation with its staff. The various copies available of the students' magazine, *The Queenwood Observer*, for both Edmondson's and Willmore's times, show the range of student self-government and self-learning activities that developed from Edmondson's initial establishment of a school Mutual Improvement Society.

1.5 The accuracy of survey references

The candidate classifies his work as a "pre-hypothesis" study of five selected nineteenth century school teachers who had executive control of their school finances and curricula and who used science in pursuit of their pedagogical objectives. The purpose of the enquiry was to understand the ideas of the selected teachers, their successes and failures in order to consider what might be inspiring, possibly practicable, in today's science teaching; that might contribute to attracting more school students to the appreciation and study of science at school.

One specific question for this field of study where, as Benedetto Croce early in the twentieth century indicated all history is a result of transactions in the human mind is: However open an enquiry may be, the important question to ask: is the evidence presented reliable? That is a hard question because, as in the example of Owen's five apprenticeships Podmore's (1906) descriptions are drawn from Owen's own autobiography (Owen, R. D., 1874). The candidate can only draw on his own experience in establishing samples of retail and wholesale outlets to say that the descriptions "ring true". That together, the apprenticeships represented a thorough

trade training admirably planned by his elder brother. With regard to Owen's "Life – written by himself" and published in 1857" when Owen was 86 years old and only a year or so before his death – Owen already had about a hundred publications to support his memory.

Richard Dawes in the early pages of his publication, *Hints on an Improved and Self-Paying System of National Education* (Dawes, 1847) clearly set out his program of social reform which included overcoming class differences between employers and employees, his desire for workers to be paid a "living wage" and teachers to be provided security through a superannuation scheme.

Subsequent writers who saw Dawes only as a great school teacher and a proficient Dean of Hereford did not refer to Dawes' "social manifesto".

The aims, and work of Queenwood's Quaker headmasters and Edmondson's personal deficiencies were amplified by descriptions from the journals of Tyndall, Frankland and Hirst, contemporary newspaper information from digitised newspaper archives and the 1863 auctioneers' details of the school property.

Two books, each associated with H. G. Wells, *Sanderson of Oundle* (Anonymous, 1923) and *The Story of a Great School Master being a Plain Account of the Life and Ideas of Sanderson of Oundle* (Wells, 1924), provide most of the information used about Frederic Sanderson.

The 1923 book was intended as the official school tribute to Sanderson who had died in the previous year. It was based on sixty or more contributions from teachers, former students and friends of Sanderson and edited by H. G. Wells. A dispute between Wells and Mrs Edmondson about content caused Wells to withdraw his association with the book, which was then published without an identified editor.

In addition to the various corroborations above, the candidate was authorised by Richard Palmer to quote from his hitherto publicly unavailable Ph.D study, *Sanderson of Oundle: A New Assessment* (Palmer, 2006).

1.6 Research questions

The act of writing history of any type about any person who lived in a period outside one's experience has to be presumptuous and hazardous because change can take

place at each of the three prisms through which we try to examine the historical scenery. The subject of our enquiry may change his view over time (Sanderson) or forget an earlier expression of it (again Sanderson) or deliberately look past opposition in order to have a clearer field for the expression of his own view (Dawes). At a secondary level, we have to be aware of the supporters of our subject of enquiry, their hero, casting him in the shape of their definition of a hero (supporters of Dawes). At the author's level we have the problem of objectivity – are we introducing our own prejudices? And over the whole perceptual field, are we dealing with mirages caused by changes in the meaning of words or differences in their delivery?

This study was guided by seven research questions that arose from reviews of the historical literature about the times and work of the five headmasters. Responses to these questions are made under the same headings in Chapter 14, the final chapter. The intervening chapters provide the details for the claims made for answering the seven research questions.

With reference to the five headmasters:

1. What were their early life experiences and visions for schools?
2. What were the sources of their educational ideas and their work relationships?
3. How did they engage students to be interested in schooling?
4. How and why did they include school subjects without any borders?
5. How did they bring science into the school curriculum?
6. What opportunities did they provide for student self-learning and application?
7. How and in what ways did their schools engage with society?

A comment in the conclusion of Chapter 14 briefly examines if the headmasters' schools outlast the headmasters' tenures?

1.7 Organisation of thesis chapters and appendices

The chapters in this 2018 re-submission have been re-organised from the original submission and the thesis is now presented in four sections.

A. Chapter 1: Introductory (including research questions)

B. Chapters 2 -7: Significant 19th Century developments in English school education

C. Chapters 8-13: The five Headmasters' individual contributions to education

D: Chapter 14: Appraisal of the Headmasters and their contributions to education

There are six appendices:

I. Selected 19th century statistics emphasising British population growth, relatively faster growth of major cities, huge industrial growth - especially of cotton, expansion of British Empire and, late in the century, of children in schools the change of scientists' social class.

II. The historicity of Jane Benson's 1879 publication: *From the Lune to the Neva sixty years ago; with Ackworth and "Quaker" Life by the way*. (Jane Benson was the daughter of Anne and George Edmondson.)

III. George Edmondson at Ackworth School

IV. George Edmondson's *bête noire*

V. Queenwood College Evening Lectures 1847-48; Frankland's examination papers; the sensitivities of John Tyndall

VI. The contribution of digitised newspaper archives to the history of Queenwood College

Chapter 2

EDUCATION IN ENGLAND IN EARLY NINETEENTH CENTURY

The infant poor of this country ...wandering about on the Sunday, idle, dirty, ignorant, and immoral. (Hill, 1836, Vol 1., p. 100) and [Note 2.1 ... I ... became vividly alive to the deteriorating condition of the young children and others who were made the slaves of these new mechanical powers. (Owen, R, 1857, p. 112)

2.1 Education for poor children

There were conservatives at the beginning of the century who opposed education for poor children for fear it might upset the class system: it might make the children dissatisfied with their pre-ordained station in life and lead to insurrectionary ideas. This class argument was presented in the House of Commons by Tory M.P., Davies Giddy in 1807:

the project of giving education to the labouring classes of the poor, would [...] be prejudicial to their morals and happiness; it would teach them to despise their lot in life, instead of making them good servants in agriculture and other laborious employments to which their rank in society had destined them; instead of teaching them the virtue of subordination, it would render them factious and refractory [...] it would enable them to read seditious pamphlets. (Hansard as cited by Gillard, 2011).

In cruder form, Richard Dawes (subject of Chapter 9) heard of a farmer who asked: “Will education for a boy make my turnips grow? (Dawes, 1847, p. 4)

In England, at the turn of the century, with little to no education for the poor, conditions in the industrial cities were unpleasant for the citizens. Frederic Hill [see Note 1] in 1836 drew on an eye-witness of the time to describe Birmingham city streets in the 1780s:

Before Sunday Schools were established, and until there had been time for those educated in them to take their standing as men neither life nor property was secure. A brutal spirit of intolerance, religious and political, pervaded the people, and drunkenness, filth and rags met the eye in every direction (Hill, 1836, p. 113)

Hill considered few children of the poor or working classes had any worthwhile education before the end of the eighteenth century and, when writing his book a third of a century later he saw only little improvement in the schools available to children.

The school education of our working and poorer classes is with few exceptions, very meagre. Even in the day schools the instruction seldom extends beyond reading, writing, and the elements of arithmetic; and reading alone is taught in by the far greater portion of our Sunday schools. (Hill, pp. 17-18)

Of the two monitorial school systems, one was the *British and Foreign School Society* formed in 1808 consequent on the work of a young Quaker, Joseph Lancaster, to provide free education to the poor. It was non-denominational Christian. The other, consequent on the work of Dr Bell, developed as a proselytizing organisation for the Church of England, as its name made clear: *The National Society for Promoting the Education of the poor on the Principles of the Established Church throughout England and Wales*. Hill said the National Society's aim was to teach reading, writing and the elements of arithmetic and to ensure its students gained a competent knowledge of the Scriptures and the Church of England Catechism. The British Society, he said, presented reading, writing, the elements of arithmetic, and a competent knowledge of the Scriptures and "In some of the British schools the education extends to geography, and in a few to the elements of geometry, including the measurement of land" (Hill, p. 68) Hill considered that the two societies could not accurately estimate the number of children they had in their schools nor for how many days they attended. He estimated for England and Wales that possibly there were 110,000 in the British schools and 172,000 in National schools, the latter number being "far short of the number stated by its reports" (Hill, pp. 65-66).

Hill's book charted signs of slow progress in education for the poor. The obverse position was that Britain's slum families needed hygiene and nutrition more than they needed attempts to educate their children. In 1832, four years before Hill's book was published, Dr. James Kay, medical practitioner (later Kay-Shuttleworth, assistant-secretary to the education department of the Privy Council) conducted a census of Manchester's worst slums. To read his report (1862, Section 1832) to a modern audience is to invite disbelief that families could exist in conditions approximating open sewers. Such conditions continued in parts of England. For example, in Portsmouth, excluding pauper children who might receive some workhouse education:

the census of 1851 revealed that 40% of the boys and 38% of the girls were neither employed nor receiving any education [...] not only because of the small school fees but because they were often so ragged, dirty and verminous that no 'penny a week child' would associate with them. (Stanford J., & Patterson, A. T. 1974, p. 12)

Some education was provided for these children from branches of the Ragged Schools, which were associated with the National Schools Association, and which helped to provide the children with food and clothing. Naval institutions in

Portsmouth accepted some responsibility for children of seaman and provided some food to the Ragged Schools to help children.

There were examples of other schools in Portsmouth conducted by private benefactors or charitable institutions and a few kindly tradesmen who while they worked gave a little instruction to a few children but, overall, in the middle of the nineteenth century only a few, poor children received as much as a little education., a definition of which was given by a Rev. Brookfield.

The Rev. W. H. Brookfield, who was for many years an inspector of the Portsmouth National Schools, considered a school to be fair when about a fifth of its scholars could read [a few lines from a book [...] to work a plain sum in compound multiplication [...] write a few lines legibly with fair spelling [...] know a few simple facts of geography, mensuration and topography of their own country [...] but to have a sound knowledge of the ten commandments and the life of Christ. (Stanford and Patterson, 1974, p. 14)

Portsmouth did not have the large factories and coalmines of England's north or the ironworks of Wales but Stanford and Patterson pointed to its young workers in small factories who also worked long hours in poor conditions. Everywhere, it seemed that industrialisation brought long hours for poor children to work and reduced their opportunity for education.

2.2 The age of the machine and the deprivation of education

The rapid increase from about 1780 in the number of large factories which employed young children for merciless hours – up to thirteen hours a day, six days a week - acted against the education of the poor and probably reduced community levels of education.

Michael Sanderson (1995, pp. 2-13) showed that in industrial areas the ability of brides and grooms to sign their names at marriage declined over about sixty years, 1750/1760 to 1810/1820. For example, for the area described as “industrial Lancashire” in which the cotton processing industry was concentrated, the brides’ ability to sign their names fell from 26.3% to 17.9% and the grooms’ from 67.3 % to 43.1%. Measures in rural areas during these years were steady or showed small increases. It may be argued that the falls in literacy represented a secondary rather than a primary effect of industrialisation; that a large and less educated force of immigrants and also of less educated from within England could have lowered the average literacy levels in the large industrial cities. A primary effect, especially on young children, was that long hours in the mills precluded their chances of education.

2.3 The schooling of the upper classes

At the end of the eighteenth century the education of the socially and culturally dominant classes was confined to a narrow curriculum in a narrow band of schools and universities. Hans (1951) quantitatively illustrated that narrowness. Hans examined all entries, about 5,500, in the Dictionary of National Biography for men born between 1685 and 1785. That age range ensured most would have completed their formal education, if any, in the eighteenth century. Hans then excluded those educated in other countries and those who had no formal education to arrive at the pattern of British education experienced by what he described as the “intellectual élite”. It will be seen in Table 2.1, that of the total sample, 46.2% went to Oxford or Cambridge, 23.5% to one of the four Scots universities or Trinity College Dublin, 3.4% to Leyden or one of ten other Continental universities and 26.9% moved directly to professional training or other activities.

Table 2.1 also shows that the largest of the seven classified groups, 27.6% of the total sample, consisted of those who attended no secondary school but were educated at home or in the school of a private tutor. Those in this group were also the most likely to attend a university; 92.9% and just 7.1% proceeded directly to their career choice. The second group, 22.3% of the total sample, consisted of students from the nine historic Public Schools. [Winchester (founded 1387), Eton (1441), St. Paul’s (1510), Shrewsbury (1552), Westminster (1560), Merchant Taylor’s (1561), Rugby (1567), Harrow (1571) and Charterhouse (1611) From this group 72.7% of their students went on to Oxford or Cambridge and 5.1% to Scots, Irish or Continental universities.

The third group of English Grammar schools was attended by 17.0% of the sample and 67.5% of their number went to a university, mostly Oxford or Cambridge. The top twenty schools in this group accounted for about one-third of all the Grammar school university scholars. The fourth group, 11.8%, attended Grammar schools in Scotland, Wales and Ireland and 69.8% went to universities in their respective countries; the fifth, 9.0% of the total, attended private schools and 69.7% attended universities, mainly Oxford or Cambridge. The sixth group, 7.6%, attended English dissenting schools or academies but few, just 23.4%, attended universities, mostly Scots or Irish. For that there were two main reasons; they could not conscientiously

attend Oxford or Cambridge which limited entrance to those professing belief in Church of England doctrine and the high tertiary standard of many dissenting academies obviated further study. The final group, just 3.6%, consisted of Catholics just 16.8% of whom attended a university, preponderantly a Continental Catholic University.

It is notable that the largest group of Hans's eighteenth century intellectual élite, 27.6%, by-passed the available systems of secondary education by employing tutors to educate their sons. Either they expected their sons to gain outstanding results within the classical system of the day as half continued to Oxford or Cambridge and 43% of the tutored students, perhaps seeking scientific or medical courses, or of dissenting bent were prepared to enter universities which imposed no doctrinal affirmations on students. Overall, this group of home-tutored students was more likely than any other to attend a university. Peter Mark Roget (1779-1869) of Roget's Thesaurus fame, for example, was a member of this group. His biographer, Joseph Kendall (2008, p. 35) noted that for six years the young Roget attended David Chauvet's home school in London where the curriculum included, "Latin and Greek, modern languages, and all branches of science." And that before Roget was 14 he became a medical student at Edinburgh University.

Table 2.1 18th century schooling of British intellectual élite who completed pre-university education in Britain

Pre-university schooling of the intellectual élite (read per cents down)	Total	Universities attended (read per cents across)			
		Oxford or Cambridge	Scotch or Irish (a)	Continental (b)	Other or no university
Pre-university schooling	3,500 100.0%	1619 46.2%	820 23.5%	120 3.4%	941 26.9%
Private tutors & home education	967 27.6%	482 49.8%	283 37.6%	53 5.5%	69 7.1%
Great Public Schools (c)	780 22.3%	567 72.7%	25 3.2%	15 1.9%	173 22.2%
English grammar schools (d)	594 17.0%	372 62.6%	19 3.2%	10 1.7%	193 32.5%
Welsh, Scotch & Irish grammar schools	414 11.8%	22 5.3%	289 69.8%	3 0.7%	10 24.2%
Private academies & schools	314 9.0%	144 45.8%	69 22.0%	6 1.9%	95 30.3%
English dissenting academies/ schools	265 7.6%	10 3.8%	39 14.7%	13 4.9%	203 76.6%
Catholic Colleges	125 3.6%	1 0.8%	1 0.8%	19 15.2%	104 83.2%
Unclassified	41 1.2%	13 31.7%	9 22.0%	-	19 46.3%

Notes: (a) The four Scots universities: Edinburgh, Glasgow, Aberdeen and St. Andrews and Trinity College, Dublin. (b) Leyden and ten other Continental universities. (c) Winchester, Eton, St. Paul's, Shrewsbury, Westminster, Merchant Taylor's, Rugby, Harrow and Charterhouse. (d) There were 170 schools in this group.

Source: Hans, N. (1951, p. 19, Table 1)

2.4 Continuity of upper class education in nineteenth-century

Hans (p. 30) wrote, "On the whole the Grammar Schools may be described as schools of the middle class, whilst the nine Great Public Schools were of the upper class." Following Hans's method, the *Oxford Dictionary of National Biography*

[DNB] entries of the twenty men who were British prime ministers in the nineteenth century were examined. The results showed they followed a narrow path.

- **Secondary school attended:** Eton 9, Harrow 5, Westminster 2, Charterhouse 1, Winchester 1, Home tutoring/ private schools 2.
- **University attended:** Oxford 10, Cambridge 7, Home tutoring/ private college 2, Military College 1, and one additionally attended the University of Edinburgh.
- **University College attended:** Christchurch Oxford 9, Trinity Cambridge 3, St. John's Cambridge 3, Brasenose Oxford 1, Pembroke Cambridge 1, and no university 3.

The Prime Ministers' biographies indicated that to make friends was important in their choice of secondary schooling, universities and university colleges.

2.5 Notes to Chapter 2

Note 1: Frederic Hill was a member of a remarkable family. His father, Thomas Wright_Hill (1763-1851) was a member of Joseph Priestley's Unitarian Church in Birmingham. In 1803, the father opened a school near Birmingham known as "Hill Top" and later as "Hazelwood", at which he educated his sons. Frederic became an assistant teacher at the family school. He became an active supporter of the movement to widen the parliamentary franchise, examined the education of the day and in 1836 published *National Education: its present state and prospects* and for which he received co-operation from the Manchester Statistical Society. He studied law and was appointed Inspector of Scottish prisons achieving many reforms. In 1851 he was appointed assistant secretary to his brother, Rowland, who was the postmaster general. Sir Rowland Hill simplified the postal system by introducing the one penny stamp with which a half-ounce letter could be mailed anywhere in Great Britain.

Note 2: According to Anita McConnell, the Sunday School Movement gathered strength about 1780 with Robert Raikes, an Anglican layman, prison reformer and publisher of *The Gloucester Journal*, and Thomas Stock, a curate of a neighbouring parish, formulating a plan for the conduct of Sunday Schools. Others, also, about the same time initiated Sunday Schools to provide education and religious instruction for poor children on Sundays. In 1784 John Wesley noted that Sunday schools were "springing up everywhere I go" and encouraged his followers to start similar schools. Baptist William Fox consulted with Raikes and established the Sunday School Society in 1788. In general, according to McConnell, "the idea of religious instruction for children on Sundays [was] mostly promoted by dissenters." The 1851 Census of Education indicated that 13.4 per cent of the population had some attendance at Sunday Schools compared with 12.4 per cent stating attendance at weekday schools (Chapter 3, Table 3.2)

2.6 Summary Chapter 2

During the first decade of the nineteenth century little education was available to children of the poor. Some churches provided a little training in reading on Sundays and the new monitorial school day systems the Church of England National Schools and the British and Foreign Schools Society supported by Dissenters, were getting their first scholars.

- By the 1830s the two systems had gathered students but the National Schools' estimates of numbers and days attended were considered too high and the British Society admitted it did not know its own figures.
- In the major industrialised cities over the sixty years, approximately 1780-1840, levels of education fell in the industrialised cities, partly because of migrants from the countryside with little education and partly because long hours prevented access to education. It was a phenomenon of the industrial age in Britain that the workers' level of education negatively correlated with economic progress.

The upper class pattern of schooling in the eighteenth century continued into the nineteenth.

Chapter 3

THE CHURCH OF ENGLAND OPPOSES STATE ENTRY TO EDUCATION 1833-1851

[The Government] are not simply granting aid, they are constructing a system of education. [And in that system,] the State is in favour of the unrestricted use of private judgment; the Church is, and must ever be, against it [...]. The Church knows that unless (its) teaching *is* most carefully preserved [...] all education will be valueless. (Denison, 1847, pp. 7 and 10)

3.1 Education and the Church of England

This chapter sets the scene for the educational activities of the second and third headmasters: Richard Dawes, [Chapter 9] who developed and directed his school at King's Somborne during 1842-49, and George Edmondson, who was headmaster of Queenwood College, 1847-63 and the contributions of the first two Queenwood science masters, John Tyndall and Edward Frankland who taught at Edmondson's Queenwood College during 1847-48 and the first quarter of the 1848-49 school year. The Chapter further indicates the inadequate state of elementary education during 1833-51 and demonstrates the vigorous endeavours of Church of England organisations to prevent the State entering the field of education or even to evaluate its condition with the 1851 Census of Education.

The history of education during the nineteenth century is inseparable from the history of the Church of England, which is the State Church of England and was of Wales until 1920. Henry VIII founded the Church of England when in 1534 he legislated through the Act of Supremacy to displace the Pope as head of the Church in England and Wales and curb the practice of Roman Catholicism in Britain. Between 1559 and 1571 Elizabeth I reinforced the Act of Supremacy, made the Anglican Book of Common Prayer, the Anglican statement of belief expressed in the Thirty-nine Articles and prescribed forms of service to be compulsory for all Church services. According to Melnyk (pp. 3-4) the Thirty-nine Articles were deliberately ambiguous to permit a wide range of doctrinal belief among Church members.

On the restoration of Charles II, following the Cromwells' reigns as "Lords Protectors of the Commonwealth" an Act of Uniformity was legislated in 1662 which caused upwards of two thousand clergy and clerical teachers in Church schools and colleges to leave their positions. They left because they conscientiously

opposed clauses in the Act which related to the strict oaths of loyalty required and to a re-enforced role of Bishops within the Church. The eviction in such numbers of the “Dissenters”, as they came to be known, presumably had the effect of leaving a body of believers and assenters more orthodox in Anglican dogma and stronger in their belief in the historical “rightness” of the Church. On the other hand, those forced to leave the Church, and immediately persecuted for their dissent, might have been hardened in their dissenting views. Many established “dissenting” colleges. In 1687 James II issued an “indulgence” to end the severe repression of the Dissenters. In 1689 with William and Mary jointly on the throne Parliament passed a “Declaration of Rights” which ensured Kings and Queens of England would belong to the Anglican Church, in fact be the head of the Church of England, and a “Toleration Act” which confirmed toleration of worship for Dissenters, but not for Unitarians or Roman Catholics (Hayes, pp. 449, 451). The Declaration of Rights Act did not change the laws which prevented Dissenters from being schoolmasters, holding various civil positions or entering Oxford or Cambridge universities.

By the beginning of the nineteenth century the Church of England was no longer completely at one with the State in controlling the religious thought of people as the 1851 Census of Religious Worship showed that the Anglican Church catered for the religious needs of just half the church-going population and fewer in the rapidly growing industrial cities.

3.2 The growth of education for the poor

Horace Mann, lawyer and assistant Census Commissioner, in his official report on the 1851 Census of Education, (1854b, p. 11) referred to the “[c]hange which half a century has witnessed in the manners of the people as but little short of miraculous”. He, like Frederic Hill earlier, attributed the great change in the population to attendance at Sunday Schools which spread rapidly around the turn of the century. Simon (1974, pp. 183-193) indicated that some Sunday schools were so much above the general level that they had extensive educational and welfare programs and could be thought of as schools on Sundays for young workers, otherwise employed six days a week.

The “changes” which Mann ascribed to the activities of the Sunday School Movement and the monitorial schools applied to those children able to attend such

institutions. The rapid increase from about 1780 in the number of large factories which employed young children for merciless hours acted against the schools; in fact, as indicated in Chapter 2 acted to reduce community levels of education.

3.3 Government intervention

Government intervention first occurred in 1833 under Lord Melbourne's Whig Government when £20,000 was provided from the Treasury to assist the building of new schools. Suspecting that opposition in the House to government monies for education might be too strong to pass an Education Bill enabling a continuous supply of money for education, the Government in 1839 used an administrative decree to establish a mechanism by which money could be supplied. It established a Committee of the Privy Council and appointed Dr. James Kay (later Kay-Shuttleworth) to administer the fund. His new employers, represented by Cabinet leaders, the Lords Lansdowne and Russell, warned him that "it would certainly be a very obnoxious position – subjecting [him] to much opposition" (Smith, 1923, pp. 66-7). Indeed, this immediately occurred as The Church of England led by High Churchmen strongly opposed any move that might abrogate what they perceived as the Church's divine right to educate the poor. However, once started, as shown in Table 3.1, the government education appropriations escalated.

Table 3.1 Government Appropriations for Education in England and Wales: 1833-1853

Period	Appropriation per year (£'000)	Cumulative total (£'000)
1833-38	20	120
1839-41	30	210
1842-44	40	330
1845	75	405
1846-47	100	605
1848-50	125	980
1851-52	150	1,280
1853	260	1,540

Source: Mann (1854b, p. 14)

By the end of 1850, according to Mann, the Government had appropriated £980,000 and disbursed about £750,000. The money was at first available as subsidies for new

school buildings and highly qualified academics were appointed as inspectors to ensure it was spent only for that purpose – and to give educational advice as requested by head teachers. Gradually, the scope of the subsidies was widened to include financial support for teachers’ salaries, school books, school equipment, aid to students to attend teachers’ training colleges, and assistance for those training colleges. Mann (1864b, p. 14) reported that of the £750,000 disbursed by 1850, about £500,000 was spent in England of which the Church of England National Schools received £405,000 - over eighty per cent - the British Schools Association £51,000, schools in workhouses, (where there had previously been none) £37,000, Wesleyan schools £8,000 and Roman Catholic schools £1,049. This appeared an inequitable distribution considering the numbers of schools controlled by the Church of England and others but represented one effect of a government subsidy system – that richer institutions may more easily raise their portion of the cost of a subsidised project.

3.4 Opposition to State aid

In addition to the class argument against educating children of the poor [Chapter 2.1], the High Church opponents of State assistance put forward a dogmatic basis for the Church to control their education. Leading opponents within the church identified by Rev. Richard Dawes (1850, p. 4) included High Churchmen associated with the Tractarian movement: Archdeacon George Denison and Archdeacons Sinclair and Manning (later, Roman Catholic Archbishop of Westminster) as cited at the head of the chapter, argued that the State would require independent thought which could contradict the ‘truth’ held by the Church. Not all Churchmen agreed with Denison. Theologian, F. D. Maurice, for example, described Denison as “a vulgar Church agitator, using the most sacred phrases for claptrap” (Selleck, p. 234).

Richard Dawes (subject of Chapter 9), defended the government’s aid policy. In his reply to Archdeacon Denison he attacked the Established Church’s education record:

Has the example of the last four hundred years (surely three hundred?), during which time the education of the country, and more particularly of the labouring classes, has been in the hands of the clergy, done nothing to open their eyes in this respect? [...] Is the result such as to make it satisfactory to leave it entirely in their hands for the future? (Dawes, 1850, p.10)

A few of the opponents of State education did not oppose better education for the poor, but worried that a government-imposed curriculum would lead to state-controlled thought (Bottomley, 2014, p. 255).

3.5 Assessment of school education - the 1851 Census of Education

In March 1851, the British Government conducted something never previously attempted - three censuses simultaneously. Together with the regular decennial Population Census it conducted a Census of Education to collect information about Sunday schools, day schools and adult education organisations; a Census of Religious Worship which estimated seating capacity in all places of religious worship and attendance at them on Census Sunday, 30 March. The task was novel and complicated. The Department required a year to collect all the information for the Education and Religious Worship censuses and an unstated time to sort thousands of census returns and other census documents which were mixed during transit from field to office.

Towards the end of April, 1851, a vast confused accumulation of returns and lists had arrived. Most of the parcels, insecurely packed, had been forced open in the course of their transmission through the post, and the greater portion of 100,000 documents were intermingled, so that forms of different descriptions and from different localities were mixed together. This involved a process of sorting – forms of similar character (as referring to Day Schools or Sunday Schools &c) being brought together, and the whole then numbered and arranged and bound in topographical parochial order. (Mann, 1854b, p. xcvi)

Horace Mann wrote the reports for all three England and Wales censuses. (Religious Worship, 1854a, Education, 1854b, Population, 1854c) In his report on the Education Census (p. 10) he referred to his first problem which was that opponents of the Education Census had threatened to persuade schools not to respond and had gained a legal ruling that the questions about education fell outside the compulsory provisions of the Census Act. By the time Mann received that notice all the various Census forms had been distributed to District Collectors who then had to explain to respondents that it was not compulsory for them to answer the education questions. However, the collectors' tact and persistence over the next twelve months won out: returns, according to Mann, were gained from 99.7% of public day schools, 96.4% of private day schools and 98.4% of Sunday schools. Not every return was complete or every question unambiguous but it was surely a success for the first British census of its kind, conducted under the difficulties mentioned, and with hand processing! Mann pointed out that those problems, together with the extra tabulations asked for during processing delayed the Reports for the Census of Education and the Census of Religious Worship for England and Wales until March 1854. Mann used the Census results and Government information of previous education inquiries to answer three questions set for him

Does the present state of education, as exhibited [by the Census results], display considerable advance upon its state in former periods, so as to give evidence of *progress*?
 What number of children out of the population of England and Wales in 1851, should constantly be found at school?
 What is the *character of the instruction* afforded to existing scholars? (1854b, p. 11 – Mann’s italics)

3.5.1 Progress in education

Mann indicated that the numbers of schools and numbers of scholars as a proportion of the population had increased considerably over the years 1818 to 1851. Scholars as a proportion of the population were now one in 8.36 for schools giving classes on week days and one in 7.45 for Sunday schools. For his earlier figures Mann drew on 1818 and 1833 Parliamentary Reports to construct tables from which Table 3.2 is derived and from the Census of Education results to show in Table 3.3 numbers of schools and scholars as at 1851.

Table 3.2 Enrolled scholars 1818, 1833 and Census 1851

Periods	Population of England and Wales at each period	No. of scholars at each period		Proportion of scholars to population at each period	
		Day scholars	Sunday scholars	Day scholars: One in	Sunday scholars: One in
1818	11,642,683	674,883	477,225	17.25	24.40
1833	14,386,415	1,276,947	1,548,890	11.27	9.28
1851	17,927,609	2,144,378	2,407,642	8.36	7.45

Source: Mann (1854b, p.16)

Table 3.3 Registered scholars and numbers at day schools on Census day, 31 March, 1851

Day schools (no.)	Students associated with schools	Boys associated with schools	Boys at school on Census day	Girls associated with schools	Girls at school on Census day
	(no./% of total)	(no./% of total)	(no./% of total)	(no./% of total)	(no./% of Total)
Total					
46,042	2,144,578 100%	1,157,685 54.00%	968,580 45.16	986,693 46.00%	817,744 38.13%
Public day schools					
15,518	1,422,982* 100%	801,156 56.30%	642,690 45.16%	621,826 43.70%	484,297 34.03%
Private day schools					
30,524 (est.)	721,396* 100%	356,529 49.42%	325,890 45.17%	364,867 50.58%	333,447 46.23%

*The average number of students in public day schools (e.g. the monitorial schools) was 91.7; in private day schools, 23.6. Source: Table Aii, Census of Education, 1851

Mann (1854b, p. 29) made “A rough attempt to classify according to efficiency the 29,425 private schools which had returned Census forms.” He classified 13,879 (47.2%) as “inferior” of which 708 respondents were unable to sign their names; 7,095 (24.1%) as “middling”. They were more of a commercial bent, offering arithmetic, English grammar and geography. 4,956 (16.8%) Mann classified as “superior”. They included boarding schools, ladies’ colleges and others offering a classical curriculum. There were 3,495 (11.9%) which Mann could not classify.

But Mann realised his tables did not adequately represent the education scene. They did not separate the Grammar Schools referred to as “Public Schools” from schools for the public such as the National and the British Schools Associations. He devoted pages 40-87 of his official report to arrive at finer classifications

3.5.2 Numbers of children who should be in school

Mann estimated there should have been 968,557 more children in schools, of whom 600,000 should have been girls. To arrive at those figures he subtracted from the 4,908,696, the census figure for children aged five to fifteen, the numbers of children who in the social circumstances of the day would not be expected to attend school, namely: children in employment, girls not in employment who might be required for home duties, children who might be sick or in gaol and the number shown by the Census to be educated at home. But, and this Mann (1854b, p. 29) italicised in his report, provided they were in *efficiently conducted* schools.

3.5.3 Character of education provided

To discuss the character of education, Mann examined the numbers of scholars who had access in their school life to eleven subjects listed on the Census form. Mann was disappointed that few received instruction in more than reading, writing and arithmetic, which he considered reflected the paucity of education received by working class children who were more likely to stop their schooling earlier than children of the middle class.

Mann (1854b. p. 30) looked at the teacher training situation and found cause for optimism as there were thirty-nine teachers' training colleges capable between them of training two thousand teachers a year. Thirty-four were operated by the National Schools Association and one each by the British schools, Roman Catholics, Wesleyan Methodists, Congregationalists and the Voluntary School Association. Other than the latter two, the teachers' colleges accepted Government subsidies. The figures also implied that more teachers and assistant teachers would soon be needed as the monitorial system was rapidly being modified from its original limit that one teacher could control a thousand students to a limit of two hundred. The answers to Mann's three questions were clear:

Considerable progress had occurred in terms of the proportion of children attending schools;
Within the social conditions of the time (i.e. allowing for the number of employed children)
there should be nearly another million children in schools, over sixty per cent of whom should
be girls;
The content of education should be considerably improved.

In Mann's mildly expressed words:

The conclusion, however, can be scarcely avoided that, whatever may be the prospect before us of attaining, at no distant period hence, a great accession to the number of efficiently conducted day schools, the actual present state of many must be far from satisfactory (1854b. p. 32 – Mann's italics)

3.6 Summary Chapter 3

- This chapter describes significant events in the organisation and evaluation of education in England and Wales during 1833-1851. It provides background to the ideals and teaching of the second and third selected Headmasters: Richard Dawes and George Edmondson and the teaching of Tyndall and Frankland. The chapter shows the State Church of England was an influential force in encouraging nineteenth century education for the poor but opposed State "interference" and despite considerable increase in the number of children gaining some education, the standard of that education was low.
- With its clergy servicing the great cathedrals and parish churches and teaching the poor in its schools, as it had done for at least 300 years, and with its bishops in the House of Lords the Church of England was an institution with property, power and staff to protect and pursue missions. One mission strongly emphasised during 1833-1850 by the 'Tractarians' or High Church section was to defend what was seen as a Divine Right of the Church to convey truth. In consequence, although the Church through its many elementary schools received eighty percent of Government subsidies, the High Churchmen disputed the Government's right to stipulate how the subsidies should be used. They also hindered the Government's 1851 Census of Education.
 - Education for the children of the poor up to 1851, especially in the rapidly growing industrial cities, improved from almost negligible to about one child in eight attending an elementary school, though with what frequency over what time was not clear. The 1851 Census of Education reported the education received by those who attended any school was inadequate. There was little improvement in attendance until a Factory Act of 1833 limited children's work hours.

Chapter 4

AN EARLY MOVE TO PROVIDE SCIENCE FOR ALL CLASSES IN THE COMMUNITY

In 1853 in a letter to *The Times London*, Michael Faraday, Superintendent of the Royal Institution of Great Britain, reported his investigation of spiritualism and one of its apparent manifestations, table-turning. “Faraday concluded (his letter) by saying that the educational system must be deficient since otherwise well-educated people would not believe in the phenomenon in the way they did.” (James, 2008, p.17)

4.1 Promoting scientific education among all classes in the community

To remedy what Faraday saw as a deficit in people’s education, James stated that “Faraday and Henry Bence Jones, (a manager of the Royal Institution) (organised) a set of lectures on education” to stress the importance of science. These lectures by senior men in science, medicine and education were at the beginning of a long-running debate on science versus the classics or science and/or classics in a modern curriculum. For the most part the speakers put forward ideas for reform of the classical syllabus by adding or subtracting subjects on the basis that the changes they suggested would improve students’ inductive faculty.

Twenty years earlier, in the *Quarterly Journal of Education* for 1834 and 1835 Thomas Arnold, Headmaster of Rugby described the content of his liberal curriculum. He stated that the Rugby timetable allowed students to work 28¾ hours a week, plus sundry extra lessons and evening ‘prep’. The school year was divided into two equal parts; ‘language time’ and ‘history time’; “the poets and orators being read principally during language time, and (ancient) history and geography being chiefly studied during history time” (Findlay, 1914, p. 208). The acme of Arnold’s system was in the students’ sixth form training, usually conducted by the Headmaster. That put great pressure on fifth form students for Arnold accepted for sixth form only hard-working, high achieving students with a good moral attitude. To get there they had to conquer the language and history of ancient times or leave Rugby. Those, like Arnold, who defended that *liberal* education, were defending a system aimed at training students for public life, whose parents could afford them to stay extra years at school and, in the case of Rugby – and presumably other Great Public Schools – be able to enter the sixth form. Arnold was not opposed to science as a school

subject. He considered it was appropriately taught in schools catering for boys entering commercial life and whose parents could afford their fees only to ages 15 or 16. For his course, rationalised from its original purpose of providing a *lingua franca* for the educated to a training course for public service careers, there was no time to include science.

4.2 Seven Lectures on Education

In 1854, the Royal Institution of Great Britain [RI] presented the lectures inspired by Faraday's experience in investigating spiritualism. The lectures were issued as a book under the title, *Seven Lectures on Education* and introduced by an editorial note: "*The RI Managers state their hope that the present volume will materially assist in promoting the extension of Scientific Education among all classes in the community.*" [Citations in this section refer to page numbers in the RI book of the lectures published in 1854.] Other than Tyndall, who could visualise an alternative curriculum, the lecturers put forward ideas to modify the current classical curriculum. The seven lecturers in the RI lecture series were distinguished university teachers and scientists. Points included in their lectures were as follows:

4.2.1 Dr. W. Whewell, D.D., F.R.S., philosopher and Master of Trinity College, Cambridge: Influence of the history of science upon intellectual education.

Whewell put forward the proposition: "That every great advance in intellectual education has been the effect of some considerable scientific discovery, or group of discoveries" (p. 6). Listeners who might have expected a dynamic theory of the curriculum would have been disappointed. Whewell did *not* consider there had been great advances in intellectual education since ancient Athenian and Roman times: The Athenians had discovered the certainty of geometry which led to a belief in eternal values; the Romans had developed the study of jurisprudence which introduced the idea of justice in exercising law. These were two great principles to serve as the basis of education. He said:

A mind well-disciplined in elementary geometry, and in general jurisprudence, would be as well prepared as mere discipline can make a mind, for most trains of human speculation and reasoning. (p. 20)

However, Whewell thought formal logic could be replaced by history of science which could demonstrate scientists' use of inductive reasoning to arrive at their discoveries and help to standardize technical terms. That a science subject introduced

to the curriculum would allow students' minds to be exercised in the inductive process because “[i]nduction, rather than deduction is the source of the great scientific truths which form the glory, and fasten on them the admiration of modern times [...]” (p. 22)

4.2.2 Professor Michael Faraday, LL.D., F.R.S., Superintendent of the Royal Institution: *Observations on Mental Education.*

Faraday was upset that educated people could believe in spiritualism despite his own exposure of manifestations at séances; “that society, speaking generally, is not only ignorant as respects education of the judgment, but is also ignorant of its ignorance.” (p. 51) He said the key aim of education should be “to remedy people’s deficiency in judgement”. To that end he proposed that all should learn and understand the “fundamental laws of nature” such as Newton’s Law of Gravitation and “be trained in procedures and habits of mind” with respect to scientific principles, 14 of which he listed.

4.2.3 Dr. Robert Gordon Latham, M.D., F.R.S., Professor of English at University College, London, and ethnologist: *On the importance of the study of language as a branch of education for all classes.*

Latham argued that the classical curriculum should be modified by:

- Eliminating English grammar with its “ill-founded rules” in favour of students learning to speak good English through practice in company of people who spoke good English;
- Presenting only one of Latin or Greek but allowing more time for its lessons so that the subject might be treated ethnographically and students would come to understand how language develops;
- Introducing another language for science students if, say, original papers were available only in German; likewise, perhaps, Italian for music students;
- Spending less time on classics in favour of the “disciplinal value” of his suggestions “which would so exercise the faculties of the mind as to prepare the way of other subjects.” (p. 113)

4.2.4 Dr. Charles G. B. Daubeny, M.D., F.R.S., Oxford Professor of Chemistry, Botany and Rural Economy: *On the importance of the study of chemistry as a branch of education for all classes.*

Daubeny described the grandeur and sublimity that might be obtained by studying chemistry. Like Whewell, he would introduce a history of science subject to teach the methods of science. For example, students could follow Sir Humphrey Davy's explorations of electrolysis and how he resolved the problems caused by impurities. Like Faraday, Daubeny would have students know and understand the basic natural laws such as the laws of physics, chemistry and physiology. For science in elementary schools, Daubeny referred to "the Dean of Hereford (Richard Dawes), whose teaching and success in organising schemes of secular education (for the lower orders) are now fully appreciated" (p. 146). Daubeny put forward several arguments for the middle and higher orders who would not proceed to university, to learn chemistry; for example, they would not have time at school to learn higher mathematics but the study of chemistry would aid the "discipline of the mind" and provide "the basis of much useful and practical knowledge" (p. 147). The idea of a liberal education is "to provide classical and mathematical learning" for those of "superior position and of superior moral influence" (p. 150). Not to include chemistry in the training of that class would widen the gap between the higher and lower classes; with respect to Protestant clergy; the "legitimate influence of the priest over the laity" would be weakened if the priest lacked knowledge of subjects "on which the people with whom he mixes are able to estimate his superiority" (p. 150).

4.2.5 Dr. John Tyndall, F.R.S., Professor of Physics at the Royal Institution: *On the importance of the study of physics as a branch of education for all classes.*

John Tyndall, as with the other speakers, used the language of faculty psychology to define education. It was "the improvement and development of the mental faculties" (p. 172) to which the subject of physics could contribute. Tyndall argued that physics could be seen as "an implement of culture" as it could contribute to "both the acquisition of specific knowledge and the ability to render it profitable" (pp. 172-173). Tyndall, unlike the other speakers who thought a science subject could find accommodation within the classical curriculum, argued for radical change:

Unless you can say to me that the past world, or some portion of it, has been the final expression of human competency; that the wisdom of man has already reached its climax; that the intellect of today possesses feebler powers, or a narrower scope than the intellect of earlier times; you cannot, with reason, demand from me an unconditional acceptance of the systems of the past. (p. 174)\

As to what subjects a modern curriculum requires, Tyndall, arguing for physics, described, without naming the school, the meetings of the Queenwood College Mutual Improvement Society (See Chapter 12) at which many of the topics raised for discussion by the boys related to natural phenomena. Adroitly, Tyndall also argued that endowed with the ability to wonder, to question, to seek to understand natural things is to work with our God-given faculties; to set them aside to pursue a classical curriculum is to deny skills ordained by God!

4.2.6 Mr. James Paget, F.R.S., Surgeon at St. Bartholomew’s Hospital, Warden of Medical Students’ residence and sub-editor of the London Medical Gazette. (Later, Sir James, Surgeon Extraordinary to Queen Victoria): *On the importance of the study of physiology as a branch of education for all classes.*

Paget argued for physiology to be included in the school curriculum and how it should be taught. He left it to experienced school teachers to decide at what level. Physiology was important because few understood their own bodies or how to look after them. They were prey to ignorant advocates of matters affecting the body or food. The principles to be taught at school could include understanding the rhythms of muscles, including the heart, which alternated effort and rest to allow for muscle repair; understanding the process of digestion, the need to space meals, and reasons for sleep.

The most that might be expected from such school teaching would be to leave the students with “general impressions, and impart a habitual method and tone of thought” that would serve them well in whatever occupation they might be involved. (p. 236)

Paget’s final argument for including physiology in the school curriculum was that it came closer than the natural sciences in expressing God’s design of the universe.

In the study of the physical sciences we seem to come nearer to the efficient, than to the final causes of events ... in the sciences of the inorganic world, we can learn how changes are affected ... rarely why ... in the organic world the question ‘why’ can be often answered, the question ‘how’ is generally an enigma that we cannot solve. (pp. 240-1)

Paget saw the need for long-term planning to avoid conservation problems caused by “the unnatural rhythm in technological development by which the evil residues of good things have accumulated”.

If, for examples, men had been as anxious to invent the means of destroying coal-smoke, as to gain the myriad benefits of coal-fires; if they had thought as much about constructing drains below the ground, as of building above it; as much even of clearing out the refuse of our gas-lights, as of tempering and diffusing their brilliancy for comfortable use; - then we might have gained unalloyed benefits from every such disturbance of the natural conditions of life ... and that which one age hailed as a national blessing might not have entailed upon the next a national calamity. (pp. 223-4)

4.2.7 Dr. W. B. Hodgson, LL.D., Lecturer in Literature, Education and Phrenology, Secretary of Liverpool Mechanics' Institute, Vice-President of College of Preceptors: *On the importance of the study of economic science as a branch of education for all classes.*

Hodgson presented the final lecture. He argued the need for all to understand the laws of economic science. They differed from natural laws in one important aspect: for the good of society man must exert strong moral force to ensure economic progress. Man should “wholly condemn every mode of enriching the individual at the general expense, or even without the general advantage” (pp. 298-9). Teaching economic science involves learning how society functions and of inculcating the right values to control it for the general good.

Hodgson likened economic science to physiology in that flouting its laws leads to an unhealthy social body (pp. 291-3). As with other subjects, he said, the teaching of economic science increases “man’s outward resources” and is “a means of mental discipline and inward culture” (p.311). Its strong claim to be included in the curriculum is that it is an important subject that “has been so sadly neglected” (p. 312) and that “in common to religious sects of every variety ... [it shows] that the very fabric of our social being is held together by moral laws” (p. 313). In his appendix, Hodgson said, the “free action of the instructed individual is the true guarantee for the well-being of the community” (p. 316).

4.3 Supporters and opponents of science in the classical curriculum

Frederick Temple, a successor to Thomas Arnold as Headmaster of Rugby School, when speaking before the Clarendon Commission in 1864, ten years after the Royal

Institution lectures said: [science in education] “never rises to touch the sense of personality or responsibility, the sense of being yourself a person and having to deal with other persons” (Donnelly, 1999, p.1). Temple thus considered the science teaching of his day to lack humanity, but assumed teaching based on the ancient humanities achieved the objectives that the then current teaching of science failed to provide.

Temple might have been confirmed in his opinion about science in schools lacking humanity had he examined Frankland’s 1848 examination papers at Queenwood College (Appendix V). He would have seen that the questions related to the mechanics of chemistry, such as forming the oxides of nitrogen or sulphur or carbon; processes more analogous in function to Latin conjugations or Greek declensions. Yet science had the ability to touch “the sense of personality or responsibility, the sense of being yourself a person and having to deal with other persons” through discussions about the social applications of science if and when they took place. As with the classics, it was a matter of teaching which, in turn, was influenced by examination questions, such as those in the Oxford Middle-class examinations. Frankland’s chemistry examination questions at Queenwood scarcely touched the social applications of science or its contribution to man’s culture. However, his class teaching and evening lectures showed his awareness of social problems that science could answer as when he demonstrated through a class exercise that it was cheaper for a community in a hard water area to have the municipality rather than householders individually soften their water. Edmondson was aware of science in human progress. [In his Letter to his agriculture students in the Supplement to *The Queenwood Reporter*, February 15, 1848 Edmondson stressed how science applied to farming methods and implements had increased productivity and given the farmer more time for religious contemplation,]

The arguments advanced by Arnold and Temple used the unsatisfactory debating device of comparing like with unlike, confusing the machinery of process with outcomes and, implicitly, comparing good teaching with bad teaching. To achieve balanced argument the Clarendon Commissioners could have asked Temple what proportion of students completing a school classics course achieved the humane characteristics he described as the curriculum outcome. And, similarly, they might

have questioned the advocates of school science about the outcomes they expected in terms of social objectives; objectives such as those raised ten years before by Whewell, Faraday, Daubeny, Tyndall, Latham, Paget and Hodgson.

4.4 Challenges to orthodox intellectual thought

Contributors to *Science, Religion and the Critical Mind* which constituted Part I of the 1959 publication, *1859: Entering an Age of Crisis*, included in their lists of important publications: Charles Darwin's *Origin of the Species by means of Natural Selection or the preservation of favoured races in the struggle for life* published in November 1859 and in February 1860, essays by seven authors broadly supporting Biblical criticism which appeared in *Essays and Reviews*. These publications appeared during Edmondson's final years but their effect in delineating the theological position of British clergy with respect to "creationism" became clear in 1864, Willmore's first year at Queenwood College. Whether or not Willmore read these publications or as a Quaker cared anything about them, he could scarcely have avoided knowing about them because they "touched off a controversy which lasted four years and mobilized the resources of both church and state." (Altholz, 1988, p. 28-29)

Of the many nuances of the arguments by those for and against *Essays and Reviews* an essential one was whether the Bible *was* the Word of God or the Bible *contained* the Word of God and thus search was necessary to interpret the Bible. Brock and Macleod (1976) indicated the clergy favoured the former view when in 1864 they expressed their agreement with what was referred to as the 'Oxford Declaration' directed to the Archbishop of Canterbury.

This Oxford Declaration declared 'from belief' that the Church 'maintains without reserve or qualification the Inspiration and Divine Authority of the whole Canonical Scripture as not only containing but being the Word of God.

Brock and Macleod (p. 40) stated that the 10,906 persons who supported this Declaration consisted of more than half of all the Anglican clergy in England and Ireland.

4.5 Notes to Chapter 4

Note 1: Rugby School syllabus about 1832: In the 'language' half of the fifth form year the students studied Aeschlyus, Agamennon; Homer, Illiad V & VI, Odyssey

IX, Demosthenes, Leptines in Amphobum I; Vergil, Aeneid VIII; parts of Horace; Cicero in Verrem. ("Against Verres" is a series of speeches made by Cicero in 70 BC during the corruption and extortion trial of Gaius Verres, the former governor of Sicily.)

In the 'history' half of the year the students studied parts of Herodotus and Thucydides; parts of Livy; Hallam's *Middle Age' State of Society*. [Students in the Mathematical Division also studied quadratic equations, trigonometry and Euclid to the end of Book VI. Those in the French Division studied *Pensées de Pascal* and practised translations from English into French.] (Findlay, p. 208)

4.6 Summary Chapter 4

- In the decade before Willmore came to Queenwood College, the Royal Institution in 1854 organised a series of lectures in which the speakers variously argued for changes to the classical syllabus by adding to, or replacing, various subjects. For example, the history of science might be included to teach scientific method and sciences to teach inductive reasoning, then said to be lacking with classical subjects. The sub-text of the series was that knowledge of science could protect consumers from misleading advertising, deceit in such things as spiritualist séances and educate them with respect to protecting the environment sullied by the by-products of technological advancement.
- During the first seven years of Willmore's headmastership, the organisation of education in England and Wales changed with the advent of a State system of education. Coincidentally, new thought in science and a mildly expressed plea by "Broad Church" supporters for Biblical research led to a strong expression of fundamentalism by nearly half the clergy in England and Ireland.
- It may be inferred that re-inforced by the strength of that expression, those who earlier in the century opposed any State influence in education fought vigorously for religion to be available in the new State schools. The outcome of the fight expressed in the 1870 Education Act was that the Church system was to have priority in accepting students not previously attending a school, if it had the capacity to do so, and that religion was to be admitted to the new State schools.

Chapter 5

1858 OXFORD MIDDLE-CLASS EXAMINATIONS: ORIGIN AND SIGNIFICANCE

Of the twelve Candidates who were examined here [Southampton] in practical Chemistry, ten were pupils of Queenwood College. (*Hampshire Advertiser*, 3 July, 1858)

In the Oxford examination no less than ten out of thirteen pupils sent up from this school for examination passed, successfully. (signed) George Edmondson, Master, Queenwood College. (*Hampshire Advertiser*, 20 August, 1859)

5.1 The 1858 Oxford middle-class examinations

The Oxford middle-class examinations introduced in England in 1858 were multi-faceted. They provided assessments for secondary students unlikely to proceed to universities to show to prospective employers; they provided parents with a guide to schools whose scholars achieved pass or high marks; they indicated to the schools subject standards to aim at; and they provided the Church of England with an indirect method of presenting its tenets and practices to children of dissenting families. The examination fees of thirty shillings for the senior examination and fifteen shillings for the junior examination at a time when labourers' wages were of the order of seven to ten shillings a week further substantiated the middle-class nature of the examinations. The Oxford University Archives reported that high aims were expressed for the cultural value of the examinations for the many who would enter commerce. It was also thought that the effort required to pass would have a healthy moral effect on students by concentrating their minds on worthwhile things, as suggested here:

by means of a healthy literature ... liberalise commercial education [bring about] a response to many an appeal of reason or charity, which now falls dead on minds filled only with images of the market or of sensual enjoyment. (*Associate in Arts*, 2002, Oxford University Archives)

Initially, senior students who attained an Honours standard were awarded a Certificate of Associate of Arts. That caused some academic controversy and confusion to journalists who seemed uncertain about the standard necessary to gain the Certificate. It was replaced by a certificate for all students which detailed their results.

The first Oxford Middle-class examinations in England took place during the week beginning Monday 21 June, 1858. Candidates were able to sit at any one of eleven

centres: London, Oxford, Liverpool, Birmingham, Leeds, Cheltenham, Manchester, Southampton, Exeter, Bath, and Bedford. All Seniors (under 18 on day of examination) had to sit for: (a) a preliminary examination in writing, reading, arithmetic, English grammar, English history, and geography; (b) examination in at least four subjects distributed between literary and scientific groups; (c) unless withdrawn by parents, an examination in "Rudiments of Faith and Religion." All Juniors (under 15 on day of examination) had to sit for: (a) a preliminary examination in writing, reading, arithmetic, English grammar, English history, and geography; (b) examination in at least one and no more than four of eight set subjects (four literary and four scientific); (c) an examination in "Rudiments of Faith and Religion," unless withdrawn by parents. To gain a Pass, all students had to pass in section (a) and in at least two subjects in (b). In the first few years of the Examination, a pass was not required in (c).

As to the standard required to gain a pass in the preliminary examinations, it was reported in *The Sunday Times*, 9 January, 1859 that the 1858 examiners considered the pass level "should be not less than required by the civil service commissioners for appointment to junior public service positions."

In the 1858 examinations more than half the senior and junior candidates failed. Judging by letters to *The Time, London* and reports of speeches at prize-givings organised by local bodies, many teachers and parents were shocked at the high failure rates, especially in the compulsory "prelims." In 1859, headmasters were reluctant to present candidates who had little chance of success and they put forward a total of 896 students compared with 1,224 in the first year. Nevertheless, failure rates remained high: only 50.5% of the 299 seniors and 55.6% of the 597 juniors were passed. Rev. J. C. T. Rogers, the 1858 examiner of candidates who sat at the Southampton centre, cited, according to the *Sunday Times* article of 9 January, a report on the examinations by Dr. Frederick Temple who was by then Headmaster of Rugby:

The main of the boys failed in the preliminary examination ... the errors were in the way they had been taught ... the boys were taught without knowledge. What they studied was narrow facts without knowing the principles behind them. They faltered when placed in a new situation; new texts. (Temple, 1858)

The 1858 examinations were important as they provided the first external and independent assessment of students' and their teachers' work in a substantial number of schools. They met a need of the time to raise norms and standardise school curricula and proved by their continuing existence that they played a role in the organisation of British education. The examinations with their de-centralisation of examination places and involvement with local organisations had the interesting side-effect of increasing local middle-class pride. For example, the Mayor of Southampton, Edward Falk, was reported in the *Hampshire Advertiser* for 12 November, 1859 as saying:

I do not hesitate to say that there is no order of men in Southampton, or in England, who deserves more at the hands of the community, for almost all the benefits to this nation at large have arisen from the indomitable courage and perseverance of the middle classes. (Applause)

The Oxford University examinations continued into the twentieth century when in 1951 they became known as the GCE (General Certificate Examination) with the senior as "A" level and junior as "O" level.

5.2 Schools' participation in examinations

The headmasters of the two secondary schools studied – Queenwood and Oundle – paid close attention to the results of the Oxford Middle-Class Examinations:

Up to 1858 George Edmondson had pursued his own course. There was nothing in his record to suggest he either applied for, or as a fee-charging private school would have been eligible for, any Government subsidies during 1833-50. If he studied the results of the 1851 Census of Education he could only have been pleased that he provided an education at Queenwood College superior to that of the majority of schools in England and Wales. The Oxford examinations provided him with the means to compare his school standard with others as school names were published with candidate's results. His students gained results which were above average pass rates. For example, during 1858-60 newspapers reported three Queenwood students who gained high marks in other public examinations and one who gained entry to Sandhurst, along with students from the Great Public Schools.

Sanderson at Oundle with his unorthodox teaching methods liked to compare his students' results with those obtained by students at Rugby with its orthodox public school teaching. Sanderson persuaded the controllers of the Oxford examination

subjects to introduce “Library Work” to provide him with a direct comparison of his students’ work with any others able to sit for that subject.

5.3 Origin of Oxford examinations

There were two main reasons for the immediate and continuing success of the middle-class examinations. First, that the idea of public examinations as an important and impartial method to mark individual success had developed rapidly during the century and second, that Frederick Temple seized an opportunity for the Church of England to approach the middle-class which was turning towards the Dissenting sects. The ready acceptance of these examinations by Oxford University was detailed by John Roach (1962) and amplified by Roy Macleod (1982). According to Macleod (p. 1) “public examinations were one of the great discoveries of nineteenth century Englishmen.” Roach explained that aristocratic patronage of civil positions at the beginning of the century gave way to democratic selection by independent, impartial systems of examinations. The movement was stimulated by Oxford and Cambridge examples which early in the century introduced written examinations for higher degrees and by the 1833 Reform Act which widened the electoral franchise among the middle-class that looked for fairer methods for civil positions. In 1853, the India Act opened appointments to competitive examinations, justified in Victorian manner by likely moral gain. Roach (p. 181) wrote:

The change was recommended on the ground that the men who could achieve success in examinations were normally the men of strongest and most reliable character.

Those in the Church of England concerned about the waning Church influence in education saw the Church was weak among the middle-class and, especially in the rapidly growing industrialised towns where by 1851, the Census of Religious Worship had showed the dissenting chapels were attracting more than half of all religious congregations. The Church controlled entry to Oxford and Cambridge universities; the traditional and many later grammar schools were Anglican in charter. The Church was drawing the bulk of Government aid money for its elementary National Schools (as listed in Chapter 3.2). Roach (p. 177) commented: “The Church of England ... saw middle-class education as an important extension of the work which was already being done among the poor.” Roach (p. 178) wrote that in 1838-9, stimulated by leading Churchmen, the National Society explored the possibility of combining the Church teacher training colleges with a new grouping of

affiliated secondary schools of the type patronised by middle-class parents who did not expect their sons to continue to university. The scheme failed but as described by Roach (p. 178), Churchmen during 1840s continued to develop schemes by which the Church could extend its influence in middle-class education.

The catalyst for the 1858 middle-class examinations was an interest in raising the standard of farming in the West of England shared by four Devonshire residents: two landholders and two clergymen. They shared the idea that to raise the standard of farming it was necessary to improve the education of farmers (not the farm workers) for which educational facilities were lacking in the West Country. Between them, they brought together belief in the efficacy of examinations to raise school standards and belief in the mission of the Church to direct education. After an ineffectual attempt in 1856 to hold a competitive examination for sons and relatives of farmers, the West Country group asked for assistance from the Privy Council Committee for Education to organise their 1857 examinations. The Committee provided two inspectors to assist the group; one was Frederick Temple who had succeeded Henry Moseley as director of curriculum for Teachers' Training Colleges.

Immediately, in February, according to Roach (p. 189) Temple wrote to his friend Robert Scott, Master of Balliol, to enquire if Oxford might support a scheme for middle-class school leaving examinations, details of which he described. It was the right time for such a scheme as it rapidly gained support from academics and schoolmasters. It was endorsed in May by a Vice-Chancellor's Committee (details published in the London Daily News, 30 May, 1857 and the Morning Chronicle, 1 June), submitted to the University Convocation and adopted on 5 June, 1857.

As indicated by the Vice-Chancellor's Committee Report control of the examination system was placed under a delegacy headed by the Vice-Chancellor and members appointed by various university bodies. The delegacy was required to report annually and to operate the examinations without expense to the university and on a not-for-profit basis. Later, administration was placed in the hands of a sub-committee which represented university examiners and the local bodies which organised the regional examination centres.

The Vice-Chancellor's report listed the administrative details for the examinations: It was a university duty "to extend its beneficial influence to the education of classes now for the most part beyond its reach."

“Parliament made large provision ... for the education of the poor” and the universities already exercised “a great influence, directly or indirectly, on the training of a considerable portion of the young in the upper classes.”

For “those [...] whose parents occupy an intermediate position nothing is done, perhaps, nothing could be done, beneficially by the state.”

“There should be an examination in the rudiments of religion ... but not in cases where objections are signified by parents or guardians.”

And should the University of Cambridge “decide to introduce a similar system of exams [...] each university should act independently; let candidates or parents decide which examinations to attend.” (*London Daily News*, 30 May 1857)

All of those quotations could be interpreted that a body of Anglican academics and laymen should influence the education of middle-class students who would include many dissenters. In so doing, they would provide a service to middle-class parents through an independent and highly professional examination system, present students with an (initially voluntary) examination in Biblical knowledge and the practices and beliefs of the Anglican Church; tell the State not to interfere, and let Cambridge know there would be no co-operation: it would have to compete in an established market!

5.4 Questions on Rudiments of Faith and Religion

The subject, *Rudiments of Faith and Religion*, was compulsory for all candidates except for those exempted in writing by parent or guardian. However, marks in the subject did not contribute to examination pass level, though a Pass in the subject was indicated in students’ reports. These were the 1859 subjects specified for examination in *Rudiments of Faith and Religion*.

For Juniors:

1. The Books of Genesis and Exodus, the Gospel of St. Luke, and the Acts of the Apostles.
2. The Catechism, the Morning and Evening Services, and the Litany.

For Seniors:

1. The historical scriptures of the Old Testament to the death of Solomon; the Gospels of St. Luke and St. John, and the Acts of the Apostles. Those who offer themselves for examination in Greek will be expected to answer questions on the same parts of the Greek Testament.
2. The Catechism, the Morning and Evening Services, and the outlines of the history of the Book of Common Prayer.

Questions in Part 2 of each level related to the practices and dogma of the Church of England.

5.5 Summary Chapter 5

- Frederick Temple took advantage of an attempt by a small group of West Country academics and landholders to introduce local examinations with the purpose of raising farming standards. Temple gained support from Oxford University for a country-wide examination system, the success of which continued for many years.
- At the Oxford Middle-class examinations introduced in 1858 more than half the candidates, senior and junior, failed, as did more than half the seniors in the next two years. It may be inferred that the schools serving the needs of fee-paying elementary and secondary students were unlikely to proceed to university - the stated objective of the examination – and were stimulated to improve their teaching standard.
- The examinations also supported the proselytising activities of the Church of England with the examination subject Rudiments of Faith and Religion (voluntary - but candidates were encouraged to sit for it) in which the faith studied was that of the Church of England.

Chapter 6

AGITATION FOR A STATE SYSTEM OF EDUCATION: 1867- 1870 AND ITS CONSEQUENCES

From the thronged assemblies in suburban school-rooms and chapels to the Town Meetings and mass demonstrations, men practised their oratory and revelled in the thrust of argument [...] with the same artisan vigour in the rank and file of townsmen which today finds vent in the Saturday contests of quite different leagues. (Taylor, 1960, p. 4)

6.1 Agitation for a state system of education

Compulsory education, effectively for the children of poorer people, came slowly to Britain. At the end of the eighteenth century the upper class, as indicated by Hans's comment on his figures in Table 2.1 could afford private tutors or the fees of the Great Public Schools. The middle class could send their sons to other grammar and private schools many providing inadequate education and for which, according to Roach (1986, pp. 86-98), improvements were only slowly taking place. Agitation in England for universal elementary education which political radicals and reformers had been calling for, for a hundred years or more, reached a peak about 1867 when scenes, as described above took place.

Asa Briggs, Professor of History, University of Sussex, wrote in 1972 that the 1882 *History of the Elementary School Contest* by Francis Adams "remains the most useful single monograph on the subject, one which no historian of the nineteenth century can afford to neglect" (Briggs, 1972, pp. ix-1). According to Adams, by 1867, public debate about the shape of a comprehensive education system was intense; all parties appreciating that the costs of a comprehensive education system would be so high the State had to be involved. In the same year, in Manchester, the National Public School Association was formed to promote a system of free, secular schools in England and Wales, to be paid for by local rates, controlled by locally elected boards and with any religious activity to take place outside school hours. Its proposal,

was the first comprehensive and elaborate scheme for securing national education based on the principle that the cost should be thrown on property (per rates) that there should be local management and that education should be regarded "not as a bone of contention between churches and sects, but as the right of free citizens." (Adams 1882, p.152)

Public debate became widespread and intense. Thomas Huxley, in an 1868 lecture, said “You cannot go anywhere without hearing a buzz of more or less confused and contradictory talk on this subject.” Unlike discussions of previous times, Huxley said, people now mostly agreed that “if the country is not to go to the dogs, everybody must be educated” (Huxley: *A Liberal Education and Where to Find It*). Taylor, writing about the discussions in Birmingham, saw the discussions, as above, conducted at every level with all the fervour of a football match. Subsequently, educationists from Lancashire and other counties and members of parliament in 1869 converted the National Public School Association into the ‘National Education League’ to agitate for the following:

To secure for every child in the country a free and compulsory education which would be ‘unsectarian’ (i.e. religious instruction should not favour any sect); to be paid for by local rates and Government grants; to be managed by local authorities under Government supervision.
(Adams, 1882, p. 198)

According to Adams, in a few months, and before any public demonstrations had been made, 2,500 persons, including many of the best known politicians, thinkers and writers in England had joined the League. Before the end of 1869, the League had committees in 16 cities in England and Wales, a guaranteed fund of £60,000, established 113 branch committees, and held upwards of 200 public meetings, distributed a quarter of a million items of publicity and established a monthly paper with a circulation of 20,000. Trade unions joined and contributed funds. Volunteers carried out most of the work. Adams considered League members belonged to the Liberal party and represented all shades of religious belief, other than Roman Catholic. He considered the opposition, alarmed by the League successes, were Churchmen and Conservatives including “a long array of Archbishops and Bishops, Dukes, Earls and Tory members of Parliament” (Adams, p. 207). From a Birmingham point of view, Taylor did not see the League membership like Adams, as of “all shades of religious belief.” Rather that, “In the 1860’s and 1870’s a sharp line was drawn between Church and Chapel [...] maintained in every town. [...] Churchmen tended to feel a social superiority, and Dissenters to claim a moral and intellectual superiority. ” Further, in elementary education, “the Church fought for political control as of right” (Taylor, p.5). The League decided that in 1870, its parliamentary members would put forward a Bill in accordance with the League’s objectives (Adams, pp. 201-206).

6.2 The Education Act of 1870

Early in the first session of Parliament in 1870, Mr. Dixon M.P., who was Chairman of the Leagues' executive council and its parliamentary adviser, gave notice of his intention to introduce an Education Bill. However, he held back when the Government announced it would present a Bill which, on 17 February, was introduced to the House by Mr Forster, Vice-President of the Government's Education Committee. [The Education Committee of the Privy Council was now being referred to as the "Education Department".]

Adams (1882, p. 209) noted that "[g]reat expectations had been raised among the people and the Nonconformists" because "Forster was regarded as the Radical representative in the Ministry" and two years before had supported a Free School Bill (which was not carried). In the event, Forster's Bill disappointed those who wanted a democratically controlled, free and secular system. The Bill proposed that a year be allowed to investigate if there were any "deficiency of school accommodation" (Adams, p. 213). If in that time the denominational schools could not show they could cater for the increased numbers of students that an Education Act might bring about, local School Boards would be established with power to raise rates to supply new schools. The Boards would be elected by town councils and in country areas by parish Anglican committees ("select vestries in parishes"). Fees would be charged at Board schools though the fees could be remitted in cases of poverty. The Boards would have power to assist existing schools out of rates and the Boards would decide on the nature of religious instruction in their schools from which parents "in writing" could ask to exempt their children. The Boards would also have power to compel attendance of children between five and twelve years at either a denominational or a Board school.

Had those items become law, the cause of a free, compulsory and 'unsectarian' (a compromise term acceptable to Dissenter members of the League) would have been delayed, the number of denominational schools would have increased with the help of the existing subsidy system, the Boards would have been able to supply rate-payer money to church schools and Anglican control over school Boards would have been possible. Such possibilities were intolerable to members of the League, Dissenters

and many members of Gladstone's Liberal majority Parliamentary party. During the Bill stages, the League, on 9 March, took a deputation to the Prime Minister, "probably the most numerous and representative which had ever visited Downing Street. It comprised 46 members of Parliament and 400 members of the League, representing 96 branches." (Adams, 1882, p. 215). Taylor reported (pp.129-130) that Gladstone was unmoved by the deputation which packed the meeting room at 10 Downing Street. Following the deputation, petitions from League supporters to Parliament in numbers of signatures, heavily outnumbered those supporting the Government, but still to no effect. For example, against a Government proposal to give the new Boards of Education power to decide what religion should be taught in Board schools, "a petition against the proposal was signed by over two-thirds of all the Nonconformist ministers in England and Wales" (Adams, p. 221).

Taylor (1960), from his study of the political scene in Birmingham during 1870, considered the main issues to be:

- Opposition by members of the Church Union formed to oppose the League "stemmed simply and admittedly from their desire to retain control of the elementary schools."
- Some of the opposition considered that control of schools by local Boards of Education, as envisaged in the Bill would be "followed swiftly [...] by the disestablishment and disendowment of the Church; in fact, the League's real and only aim was spoliation, with elementary education as the stalking horse. The main dissenting sects – Independents, Congregationalists and Baptists – wanted nothing to do with a new school system controlled or penetrated by the Church of England. Therefore, though they wanted religion to be available in the new Board schools they would accept it only on the basis that no creedal 'formularies' should be presented to the children." (Taylor, p. 80)

One consequence of these various beliefs was that the League, though seeking a State secular system compromised with the Dissenting sects and replaced its secular aim with that of "unsectarianism" for the new schools.

Over the period between the introduction of the Education Bill by the Government on 17 February and its becoming law on 19 August, 1870, the arguments in the House over Forster's Bill were long and intense. They were echoed in Church and Chapel; in newspaper editorials and in street protests, one way or another.

The Gladstone Liberal Government amended some of the clauses biased in favour of Church of England control and with the support of the Conservative opposition and Church of England supporters and against the opposition of many of its own Liberal Ms. P; the Act was passed and became law on 19 August, 1870. It favoured the Church schools as it allowed them (now) six months to establish whether or not they could provide for all students in their area. Only if they could not, as in the rapidly growing industrial cities, would Board schools be introduced. It was an unsatisfactory start for a national system of elementary schools that many expected to be free, secular and compulsory. The outcome of the fight expressed in the 1870 Education Act was that the Church system was to have priority in accepting students not previously attending a school, if it had the capacity to do so, and that religion was to be admitted to the new State schools. The Act consolidated the existence of two school systems, State and Denominational, the former fully supported by local rates, the latter able to call for government grants.

6.3 Voting procedure for the new School Boards

The 1870 School Boards were elected by what was known at the time as “cumulative voting.” For example, as the Boards were to consist of 15 members, each eligible voter was allowed 15 votes to distribute as he pleased among the candidates. According to Taylor (p.146), this “move,” designed to give representation to minorities, was in line with Radical thought.” However, for optimum success at the polls, such a system required the competing parties to prepare “how-to-vote” cards and ensure their members voted for “the ticket” which, presumably some did. For example, Thomas Huxley, strong advocate for education reform in one of the busiest years of his life was elected to the London Board and continued to 1872 when his health required him to curtail his activities. During his short period on the Board “his education committee published a blueprint for London’s schooling” (Desmond, p.13). In Birmingham, Joseph Chamberlain, a League leader and the recently elected Mayor of Birmingham, expected his group of radical contestants to sweep the poll. But he did not think through the voting procedure. He encouraged his followers to allocate one vote to each of his 15 candidates. The Conservatives advised their supporters to concentrate their votes on eight of their supporters and easily won the election (Taylor, pp. 159-161). The Chamberlain party then had to wait three years to

win a Board election before it could implement its “progressive” education in Birmingham.

6.4 Progressive education: 1870-1902

Overall, the new Education Boards caused a remarkable flowering of elementary education.

During that quarter-century, the central authority had bent with the winds of change as elementary education broke its boundaries in all directions, and even started to forge links with colleges of higher education. [...] the Education Department vacillated between feeling vaguely uneasy about what was happening but lacking a rationale to stop it. (Vlaeminke, 2000, p. 10)

A significant part of the school changes occurred in the big industrial cities such as Birmingham (after 1873), Manchester and London where the majority of Board members were political liberals. There the Boards, according to Simon (1965, p. 177), extended syllabuses to include mathematics, languages and several science subjects. Students stayed longer at school and from the ages of eleven to thirteen were admitted to higher grade or central schools. The first central school opened in Sheffield in 1880, followed by Bradford, Nottingham, Halifax, Manchester, Leeds and Birmingham (Simon, 1965, p.178).

By 1895 there were 67 central schools catering for nearly 25,000 students (Simon pp. 178-9). Through evening institutes, the Boards provided some subjects at tertiary level allowing students the opportunity of entrance to universities. There was also the Recreative Evening Schools Association which functioned briefly from 1885 to 1897 and provided supplementary activities “such as music, dancing and swimming.” (Simon, 1965, p. 186)

The progressive Board schools, elementary and secondary were so successful that they challenged not only elementary schools under Church control but Grammar schools with the result, according to Simon (1965, p. 187) “in London, in 1898 there were 513,000 children in Board schools to 224,000 in voluntary [Church] schools.” Anglican Bishop Knox in 1894 reported that 14 Church schools with average attendance of 500 were “in imminent danger of closing” for want of scholars and funds and Simon (p. 188) indicated that in 1903, as a result of the new competition Church schools in Manchester, had debts of £70,000.

Gladstone's Liberal Ministry was defeated at the 1874 elections and the Conservative party under Benjamin Disraeli came to power. Lord Sandon for the new Government was able to gain the passage of a new Education Act in 1876. Its main clauses increased Church control over elementary education in country areas and improved controls for compulsory attendance at elementary schools. To the Church of England and its conservative political supporters it was a further victory in the war against competition from a state-funded and, some feared, a secular system of education.

6.5 Reversal

The Church reacted strongly to the competition from the progressive Boards. It appealed to Lord Salisbury's new Conservative government of 1895 and received, according to the Government's estimate, a grant of £616,500. The Government also made a grant for "necessitous" Board Schools of £154,000. (Simon, 1965, p. 189)

Together with Roman Catholics, the Church formed the Voluntary Schools Defence League to fight elections for school boards. A result, for example, was that In 1897 successful Church candidates supported by Catholic and independent members formed a majority on the Birmingham School Board, displacing "the Liberal-Radical majority which had reigned for twenty-seven years" (Simon, 1965, p. 190) [Actually, twenty-four years as Chamberlain and his supporters were defeated in the 1870 elections] thus starting to reverse the educational levels of the progressive school boards. Under a series of administrative regulations during 1897-1902, which were confirmed in the 1902 Education Act, the government reversed the balance of education power by placing it firmly in Church and Conservative hands and took actions which, in Simon's words "cut at the roots of the School Boards and the entire progressive educational movement under their control" (Simon, 1965, p. 196).

These new regulations defined "elementary education" as for students aged 15 or younger. A student who turned 15 might finish the academic year, and then had to leave. The regulations also:

- Indicated that the number of higher-grade or central schools would be reduced.
- Stated that the central schools would not be available for students who "ought to have gone to an endowed secondary school."
- Indicated that central schools would provide "a narrow range of subjects and equipment."

- That the existing direct link between the Government Science and Art Department and the School Boards would be discontinued.
- That evening classes would be restricted to students 16 years or less. (Gillard, Chapter 4: 1900-1944)

6.6 Confusing name changes for Boards of Education

It should be noted that the 1902 Education Act changed the meaning of the name ‘Board of Education’. Thirty-two years earlier, the preamble to the 1870 Education Act indicated that the Privy Council Committee on Education would be referred to as “the Department of Education.” Its function would be to set regulations by which local Boards of Education could establish elementary schools and pay for them by charging student fees (not exceeding ninepence a week) and by taxing local ratepayers. The 1902 Act reorganised the education system and changed the name of the Department of Education to the “Board of Education.” Thus, for citizens of the day and historians of the present a school building in 1901 labelled as under the Board of Education could carry the same label into 1903 but the ‘Board’ had changed and the happenings in that building and the educational prospects it presented to students had seriously deteriorated. In 1904, the Government extended the powers of the Local Education Authorities (LEAs) to establish secondary schools that could offer:

a four-year subject-based course leading to a certificate in English language and literature, geography, history, a foreign language, mathematics, science, drawing, manual work, physical training and, for girls, housewifery. The Regulations reinforced the tendency of the new secondary schools to adopt the academic bias of the established ones. (Gillard, 2011, Chapter 4)

6.7 Other end-of-century expansion

In the last 30 years of the century England’s population increased 50% to 30.5 million in 1901; urban dwellers were serviced by buses and trams and the London Underground was operating; the 1893 invention of the pneumatic tyre made bicycle-riding over cobbled streets tolerable and in 1894 the Lyons brothers opened their chains of teashops serving cheap meals. Added to these conveniences of urban life tertiary education was close at hand: Mechanics Institutes had become municipal technical colleges and cities had formed their own universities. Middle-class urban parents did not have to send their children to a country boarding school in Hampshire

to receive science training to sit for an entrance examination to a London University when the means had come close to hand.

British industry, belatedly, compared with Germany, discovered it needed science graduates. Donnelly (1996, p. 781) speculated that in the 1880s there were about 2,000 industrial chemists employed in British industry and that early in the twentieth century the number had increased to about 3,500. This industry demand was especially felt in the classrooms of higher institutions such as Cambridge University, City and Guilds Central Institution, Owens College, Royal College of Science and the University College, London whose student records Donnelly studied to note the high proportion of chemistry students expecting to enter industry (Donnelly, 1991, p. 7). The industry demand also increased the higher institutions' need for teaching staff but not so much for a change in what was taught. Analytical chemistry had been taught to students of medicine, dentistry and agriculture. Industry required the same techniques of analysis for quality control of raw materials, goods on the production line and, as applicable, of finished goods.

6.8 Summary Chapter 6

- In the last third of the nineteenth century education became a major topic of public debate in England and Wales. The Government introduced long-anticipated legislation for elementary education to be provided – and paid for by municipal rates – in areas where church schools could not be expected to cater for large increases in child attendance. Radical and constitutional reformers had long argued for free, compulsory and secular education to be provided by the State and a National Education League rapidly grew to major proportion in support that position
- To accommodate the dissenting churches opposed to the Church of England, the League compromised on its secular aim, substituting “unsectarianism” as its objective, i.e. that clergy should be allowed to enter the new “Board” schools but they were not to proselytise students to the beliefs of their particular Christian sect.

- In 1870, at the ensuing elections for members of the new municipal Boards of Education, the League and its supporters won many of the elections for the new Boards, especially in industrial cities where Chapel supporters outnumbered Church adherents.
- Then followed up to thirty years in which popular education flourished: standards enlarged; students were attracted from Church-supported schools and even from Grammar schools.
- In 1902, a Conservative Government formally introduced tertiary education as appropriate for State financial support but cut back what had been achieved under the municipal Boards, restricting all State-organised education to children less than fifteen years and financially compensating Church schools for their losses to the Board schools.

Chapter 7

EXPANSION OF INDUSTRY AND EDUCATION

The population of England had more than doubled from 8.3 million in 1801 to 16.8 million in 1851 and by 1901 had nearly doubled again to 30.5 million. (Jefferies, 2005, p.3)

7.1 Social and physical change at the end of the Century

The great advance for urban residents as a result of scientific research and technological development related to urban health which included sewage disposal, control of factories' ground and aerial effluent and, by Pasteur, new understandings of causes of diseases. International communications advanced with the laying of underwater cables and radio was developing. Some city streets were gas lit by the middle of the century and Wm. Crookes, FRS, lit his London home with electricity at the end of the century (Brock, 2004). Edward Frankland had noted during his time at Queenwood College in 1848 (Chap. 10.3) that a domestic gas oven had recently been invented in Hampshire but housewives did not "take" to it. He noted that he was not the only person conducting fertiliser trials with crops and was interested to see experiments with covered lot and controlled feeding of cattle in nearby Hampshire. The Singer Sewing Machine sold well in Britain from about 1867; its time-payment system of a few pennies a week was especially appealing to housewives.

Urban work needs and pleasures included use of tram, bus, train and steamship travel and early in the 1890s the invention of the pneumatic tyre allowed workers cheap and more comfortable travel to work on their bicycles and men and women to take country excursions at weekends. The 1901 Paris Exhibition indicated other countries could display ingenuity. The organisers installed in what was almost a space-age device, three annular circles of pavements moving at various speeds. Slow on the outside, fast on the inside, visitors could move to the speed they preferred. The exhibits were lit by grand displays of coloured lights. One hall contained "hundreds of new automobiles, in every shape and size" (Byatt 2009, pp. 245-248).

7.2 Deficiencies in scientific and technical education

In 1851, the Great Exhibition in London had produced an impressive display of Britain's manufactured goods and "confirmed British industrial supremacy." (Gowing, 1978, p. 3) In 1870, Britain was still the world's major manufacturer producing nearly one-third of all factory products but Government confidence was slipping in Britain's ability to hold even that position as at the Paris Exhibition of 1867 where Britain "was prominent in scarcely a dozen" of the 90 classes of manufactured goods. The Government appointed a Select Committee under Bernhard Samuelson, an industrialist, to inquire into the position and following its report a Royal Commission was established under the Duke of Devonshire. These two enquiries "depict[ed] in great detail Britain's scientific and technical education." (Gowing, p. 4) In 1882, there was a second Royal Commission which was devoted to technical education but, according to Gowing, (p. 7), there was little action until a pressure group was formed in 1887.

Gowing (p. 9) asked: "Why did Victorian England lag behind in scientific and technical education?" Gowing's answer included the factors of money, administrative structure, social class, the Church and Imperial purpose. With respect to: (1) money, government departments imbued with the ideas of self-help favoured only temporary help to those who wanted a service; they had the rising cost of elementary education through the 1870 Education Act and they preferred expenditure to be incurred at the Local Government level and paid by local rates. (2) Even if bureaucracy had held positive attitudes to scientific and technical education, there was no efficient administrative organisation to administer it. (3) The third cause was obsession with social class, which, said Gowing, appears on almost every page of the great educational reports. When foreign industrial competition alarmed the Victorians they concentrated scientific and technical education in England upon the artisans, in order to improve their skills, their readiness to accept economic laws and also their characters and morals. [...] Many Chambers of Commerce alarmed at the results of the 1867 Paris Exhibition, seemed unconscious of the defective education of managers and factory owners (Gowing, pp. 11-12).

7.3 Stimulators of demand

As the figures noted above indicate, the population in England at the end of the nineteenth century was three and two-thirds larger than at the beginning. The demographers noted the increase represented an overall contribution during the century of a falling death rate and a relatively slower fall in birth rate, plus net immigration. Within the cities the industrial revolution had caused the growth rate to be higher than for other parts of the country: the Manchester population, for example, increased nearly 17 times in the century to reach 959,000; Birmingham and Glasgow increased almost ten times; Liverpool nine times and Leeds eight times. 323,000 children attended primary schools in 1801; 1,336,000 in 1871 and, after attendance was compulsory in 1881, 3,015,000, and just on five million in 1901 (Jeffries. 2005 p.3). As reported in Chapter 6.4, by 1895 there were sixty-seven central schools in the larger cities catering for nearly 25,000 students.

The end of the century was also represented by a rapid increase in the professional business class. During 1850-80 the numbers associated with science and scientific activities sharply increased: the numbers of academics teaching science increased three to four times and membership of professional and semi-professional scientific societies more than doubled. Scientists were active in writing text books and in public discussions through which their public status increased and that of the Church.

Analytical chemistry had been taught at secondary level in Queenwood College from 1847 to prepare students for London University matriculation. There is record (Wrigley, 1982) of the 1825 opening of the Manchester Mechanics Institute which had teaching laboratories and a large lecture theatre serving the overall purpose to help advance the local cotton spinning industry.

In the end-of-century demand for chemistry workers, as industry employers, did not require of academia any significant curriculum changes because, at the time, the analytical techniques of analysis for medical purposes applied well to quality control of raw materials, goods on the production line and, as applicable, to finished goods. It was the beginning of the decline of the place of the skilled foreman in manufacturing business in favour of the bench chemist with his pipette and burette and today's automated processes.

In the community at large, workers were increasingly enthusiastic for science education whereas upper and many middle class supported the *liberal* education of their schools. Gowing cited the 1868 Taunton Report:

They [the parents] have nothing to look to but education to keep their sons on a high social level. They would not wish to have what more readily might be converted into money, if it in any degree tended to let their children sink in the social scale. (Gowing, p. 12)

The “professionalism” of science had small effect during the remainder of the century on elementary or secondary curricula which remained largely controlled or associated with the Church of England and distant from modern life. Thomas Huxley criticised men of science for not trying hard enough, for only “whispering” the idea of science in the curriculum.

The Great Public and Grammar schools, Clifton and Dulwich for example, started to introduce science and engineering subjects and build labour and workshops for its practice. The teachers were men of science. There was little attempt to associate activities in the science block with teaching the concepts of “culture” expressed in the humanities wing.

7.4 Summary Chapter 7

- During 1850-80 the numbers associated with science and scientific activities sharply increased: the numbers of academics teaching science increased three to four times and membership of professional and semi-professional scientific societies more than doubled. Scientists were active in writing text books and in public discussions through which their public status increased and that of the Church decreased.
- However, the “professionalism” of science had little effect on elementary or secondary curricula which remained largely controlled or associated with the Church of England and distant from modern life. Thomas Huxley criticised men of science for only “whispering” the idea of science in the curriculum.
- The Great Public and Grammar schools started to introduce science subjects and build laboratories for its practice. The teachers were men of science and there was little attempt to associate science teaching with concepts of “culture.”

- The trend to greater availability of science in schools and the larger public voice of scientists and scientific organisations in the 1850-80 period took place within a rapidly increasing population. Between 1871 and 1901 England's population increased fifty per cent; that of major cities even faster. Greater availability of tertiary education and of urban mobility permitted larger numbers of students to attend day or evening classes near their employment.

CHAPTER 8

ROBERT OWEN AND EDUCATION AT NEW LANARK IN 1800-1824: EDUCATING FOR THE NEW MORAL ORDER

Early working-class radical ideals [...] contained strong commitments to political, cultural and educational advance. The spirit of such radical ideas was often, especially in the early decades, strongly millenarian or messianic. There was a sense that knowledge [...] could bring immediate social improvements. Robert Owen in the 1810s was given to pronouncements about the dawning of a new era. (Silver, 2012, pp. 51-2)

8.1 Robert Owen and his 1816 Institute for the Formation of Character

Robert Owen (1771-1858) is remembered today for his contributions to the British labour and co-operative movements, his early attempts to form self-supporting communities, and a large-scale community experiment in U.S.A., which failed. He was not, as Edmondson later described him, in 1847, “a Godless socialist” (Chapter 10, 3.12). He believed in God and he naively expected society would reform itself once there was an example available of his large-scale, self-supporting, producer communities.

The Owenite interest in communities, co-operation and education was an alternative to political action; it was radical in the direction of its energies, not in the political sense. (Silver, 1975, p. 61)

Soon after 1816, Owen could claim that New Lanark, in the hills above Glasgow, was a sizeable and successful example of a happy and prosperous community produced by application of his principles. Owen insisted they were *his* principles. It would have been 1816 when an executive of the Bank of England on his first business visit to New Lanark inspected all the New Lanark establishments and according to Owen, exclaimed, “This must have been the work of some generations!” To which Owen said he replied, “[...] it had been entirely conceived by me and constructed under my immediate direction in sixteen years, no one knowing the results which I had in view.” (Owen, 1857, p. 136)

The improvements Owen introduced and his attitudes to the workers were greatly appreciated by the New Lanark inhabitants and those of the village of old Lanark – whose children Owen also welcomed to his schools. [Refer to Note 1].

The improvements at New Lanark may, indeed, have been “entirely conceived” by Owen but it is possible his ideas about the over-riding importance of social

environment on the nature of man were sharpened during his time in Manchester during 1793-98 or thereabouts when he became a member of the Manchester Literary and Philosophical Society and came under the influence of social reformer, Dr. Thomas Percival FRS, President and one of the Society founders. Percival, a physician, was campaigning against the unhealthy conditions and long hours of factory workers. Owen also frequently discussed “religion, morals [...] late discoveries in chemistry and other sciences” with friends on the staff of the Manchester Unitarian College (Podmore, 1906, pp. 55-58).

It was a time of revolutionary ideas of which Owen might have been aware but Podmore (1906, p. 226), in his *Life of Owen*, wrote “that it would be unprofitable to enquire too closely how far originality can be claimed for Owen’s system of education,” because Owen himself was not aware of his sources and his son, Robert Dale Owen, remarked his father “was not, in any true sense of the word, a student. [...] he usually glanced over books, without mastering them” (Owen, R.D., 1874. p. 90). Nevertheless, as this Chapter indicates, Owen had high technical and managerial skills and an ability to impress many in high political and scientific positions. He motivated workers with his solicitude for their well-being, and showed great love for children, which they reciprocated.

New Lanark consisted of three establishments: the mills and ancillary buildings, the 150-acre village housing the 2,000 or so people associated with the mills and the new school, *The Institute for the Formation of Character*. Since taking control of New Lanark in 1800, Owen had replaced the original mill machinery, installed goods lifts in the mills, eliminated theft of mill parts through tight inventory control, enlarged the villagers’ houses, eliminated drunkenness by limiting the alcohol that could be bought with a Mill’s credit card, controlled prices in the mill shop and raised the quality of its merchandise. He instituted health insurance for those who contributed one-sixtieth of their wages. He claimed to have reduced illegitimacy by fining the man responsible two shillings and the woman one shilling!

Owen with his first set of partners named the company the *New Lanark Trist Company*. His first partners and those of a second partnership strongly opposed his spending profits on education for the workers or their children. That despite the large profits the company was making; “between 1810 and 1813 the profit totalled £75,771

12 shillings and 3d.” In 1816, with his third set of partners, he reduced daily working hours by one hour, to ten and three-quarters. [Refer to Note 1]. Altogether, the villagers lived in a well-ordered community in great contrast to the cities of the day. New Lanark was a benevolent squirearchy, not as an anonymous Wikipedia contributor claimed, “an epitome of Utopian socialism” (http://en.wikipedia.org/wiki/New_Lanark).

Owen’s father-in-law, the entrepreneur, David Dale, original owner of the mills, had provided clean accommodation, food, exercise, medical attention and some schooling for the 500 child workers he gained from workhouses. Owen’s 1816 school continued the tradition of New Lanark schooling in a new, specially designed building. The villagers from both New Lanark and the original village of Lanark, four miles distant, were free to enter the school at any time to see how their children were taught in any of its three divisions: infant, elementary and in evenings, after work. They would have seen their children happy, friendly with their teachers and engaging in subjects advanced for the time. Because of Owen’s concern for their children’s health and happiness, the parents would have seen much activity: drill, dancing, singing; possibly, children playing musical instruments, excursions into the surrounding country-side and activities in the classroom. We assume the locals noted with pleasure the daily carriages bringing to this internationally-known school as many as 70 visitors a day, who, perhaps, required refreshment and care for their horses. Other factors made the school atypical: the mills provided the capital cost of the school and heavily subsidised (95%) its operating costs. The mills were water-powered and in the hills so the children and their families lived in clean air, unlike mill workers in the major industrial cities who might live in cholera-prone slums (Kay-Shuttleworth 1862, Part 1-1832).

8.2 Owen’s vision of a new society

In the arguments of heredity versus environment, Owen strongly favoured social environment as the more important factor in forming personal character. He understood that any person or community might be given any character “by the application of the proper means.” His “proper means” set out in his *Essay First* (1812) were to get children away from their parents at an early age, teach them love for each other and co-operation before their parents unconsciously indoctrinated

them in the ways of a competitive, profit-motivated society. In his *Essay Second*, published at the same time as *Essay First*, he repeated his arguments and stressed that a child who had been “properly instructed” would be tolerant of those “on whom other ideas and behaviours have been imposed” and would endeavour to correct them by persuasion. In exercise of his principles, in 1800 when he became managing partner of the New Lanark Mills, Owen stopped employing children under ten to work in his mills. By 1815 he had visited “most of the manufactories of the kingdom” and became “vividly alive to the deteriorating condition of the young children and others who were made the slaves of these new mechanical powers.” He endeavoured, without success, to unite his fellow textile manufacturers against child employment (Owen, 1857, p. 112). It was not until the 1833 Factory Act that the age at which children could be employed was raised and their hours of work legally reduced.

8.3 Early life

Owen was born on the 14th of May in 1771 in the Welsh market town of Newtown, Montgomeryshire. According to Claeys (2004, p. 1), his father was a saddler and ironmonger as well as the local postmaster. His mother was a farmer’s daughter. As a child, Owen was a voracious reader and rapidly became a monitor in the village school. His religious interest earned him a title of “Little Minister.” He worked part-time in the local draper’s shop.

Determined to earn his own living, at age ten he persuaded his parents to let him join his elder brother in London. He left a town which was a centre for a cottage industry weaving wool and a population of fewer than a thousand people. With good guidance from his brother and friends he had three periods of employment which, together, gave him a first class knowledge of the retail trade, wholesale and textile import businesses. He started his first apprenticeship in the quiet town of Stamford, Lincolnshire. Owen early showed himself as a religious prig. He noted (1857, p. 17) that at age 12 or 13 he wrote to the Prime Minister, Wm. Pitt the Younger, to complain that people were not adequately observing the Sabbath but he soon changed his opinions about church-going. On Sundays he attended Presbyterian services as his master was Presbyterian and also Anglican services as the master’s wife was of that faith. The dissensions between the two pulpits about each other’s

beliefs stimulated his reading about religions in his Master's library. He came to the sweeping conclusion that all religions imputed free will to men, for the moral exercise of which all men were responsible to God and their fellowmen. He wrote:

My own reflections taught me to come to very different conclusions [...] that Nature gave [us] the qualities and Society directed [us how to use them]. Thus I was forced, through seeing the error of their foundation, to abandon all belief in every religion that had been taught to man. (Owen 1857, p. 16)

McCuffog, to whom he was first apprenticed, catered to the "carriage trade," especially to the ladies who shopped between 10am and 4pm and bought high-priced materials. Owen thus had several hours a day free for reading in his master's library. For Owen it was a pleasant life in a pleasant town untouched by the industrial revolution (Owen 1857, pp. 13-14). After three years, he considered he had learnt all that McCuffog could teach him about the high end of the retail textile trade. Subsequently, McCuffog released him from his apprenticeship and Owen found strikingly different and much harder work serving in a "cash and carry" shop which sold cheap clothing on London Bridge. Here his salary was £25 a year plus board and lodging (1857, pp. 18-19). He worked up to twelve hours a day. He moved the next year to Manchester for a salary of £40 plus board, lodging and washing; to work with a retailer who was also an importer and wholesaler of textiles (Owen 1857, p. 20). Further adventures gave Owen experience in building and operating cotton spinning machinery. At age 19 he gained a high-salaried position as manager of the Chorlton Twist Cotton Mills, Manchester.

8.4 Industrial developments

Probably, in 1784, in a lovely valley in southern Scotland, two gentlemen were looking at the waterfalls of the fast-flowing river Clyde. David Dale was one. His companion, Richard Arkwright, held patents on much of the machinery used at that time in cotton mills. They agreed to be partners. Dale followed Arkwright's design to build four six-level water-powered cotton mills, sometimes known as "water frames." [According to one account two mills were seven levels and two five.] Each mill operated 6,000 spindles drawing raw cotton into cotton thread. Each spindle produced up to 300 hanks a day. Such was the power of the industrial revolution that one cottage worker with a foot-operated spinning wheel might produce only a few hanks a day (Owen, R. D., 1874, p. 27). In the same period, approximately 1785 to

1815, similar huge expansions occurred in the iron, steel and mining industries and especially in coal.

Production of pig iron was less than a 100,000 tons a year in 1790; fifteen years later it was 250,000 tons. In 1788 there were only eight blast furnaces in South Wales [...] by 1812 the figure had reached ninety. From the north-east 704,000 chaldrons of coal (one chaldron was approximately 1,422 kg) were exported along the coast and overseas in 1790; by 1815 the figure was 1,048,000 chaldrons. (Bates, pp. 84-5)

David Dale's first mill came on stream in 1789. By 1816 the four New Lanark Mills operating on the banks of the Clyde River, flowing down to Glasgow, were said by Owen's eldest son, Robert Dale Owen, to be the largest mills at that time in Scotland (Owen, R. D. 1874, p. 34).

The raw cotton was grown and harvested by slaves on plantations owned by Englishmen in Britain's West Indies. After Owen's appeal to the Government the cotton was imported almost duty free into England or Scotland where it was processed by British child "slaves", identified as "apprentices", and their adult supervisors. Originally, David Dale collected his young workers, mostly aged five to seven, from Glasgow or Edinburgh workhouses. As was then the custom the children were apprenticed for up to ten years. They worked in the mills more than 12 hours a day, six days a week, to help produce enormous profits for mill owners. On Sundays, the law required them to be taught Christianity! David Dale was superior to other employers in that he provided them with food, clothing, accommodation, and medical attention. He provided some education to his young apprentices and required them to work shorter hours than was then customary.

Mill visitors were impressed by their resulting healthy appearance. Royle cites a 1792 report on the visit of Dr James Currie, physician at the Liverpool dispensary, a friend of Dr Perceval and an early member of the Manchester Literary and Philosophical Society. Currie wrote:

The children looked cheerful and happy, with rosy cheeks and chubby countenances, and I found a variety of excellent regulations established for health, morals and knowledge. (Royle, 1998, pp. 9-10)

Royle also cited the *Annual Register*, possibly about 1792, describing the New Lanark children:

They have every day some hours allotted to them for exercise in the fields, and their looks bespeak health and vigour. These hours of relaxation the boys enjoy in succession, their apartments are cleaned and well aired, and ten schoolmasters are daily employed in their tuition. (Royle, 1998, p. 10)

8.5 Owen mixes with social reformers

During 1793-1799, Owen widened his education. He became a member of the Manchester Philosophical and Literary Society where he met social reformers and made his first attempts at presenting talks. It is surmised by Podmore (1906) that Owen's interest in social reform and particularly in alleviating the working conditions of children was aroused by Dr. Thomas Percival, FRS, a founder and chairman of the Society and a keen social reformer. During 1793-7 Owen gained speaking experience in presenting four papers (not preserved) to the Society. Owen also met frequently with friends on the staff of the Manchester (Unitarian) College "and had much [...] discussion upon religion, morals, [...] and latest advances in Chemistry and other sciences." (Podmore, 1906, pp. 57-8) Owen, also, possibly in this period, gathered his ideas about education which he later put into practice in his 1816 school. Podmore (1906, pp. 126-9) found it difficult to source his ideas as he thought even Owen, himself, did not know them. Certainly, in his teaching there were similarities to Rousseau's idea of freedom and happiness for the child.

8.6 Marriage, experience as Managing Partner, and take-overs

About 1798, Owen met David Dale's daughter, Anne Caroline, and with Dales' approval, married her in 1799. Dale favoured his new son-in-law and in 1800 allowed him, in association with his Manchester associates of the Chorlton Cotton Twist Mill, to buy his New Lanark Mills. Owen as Managing Partner immediately demonstrated his philanthropy. He stopped taking child workers from workhouses and no longer employed children under ten in the Mills. They were extraordinary actions for the times as, even with the passing of The Health and Morals of Apprentices Act in 1802, children under nine could be expected to work up to twelve hours a day. They were supposed to receive instruction in reading, writing and arithmetic on each working day for four years, and were to be "instructed in the principles of the Christian religion" on Sundays. (Parliament of the UK, 1802) In 1815 Owen surveyed the child workers' conditions in many mills and later, recollected in his autobiography:

I saw the importance of the machinery employed in them [...] I became vividly alive to the deteriorating conditions of the young children and others who were made the slaves of these new mechanical powers. [...] The white slavery in the manufactories of England was in this unrestricted period far worse than the house slaves [...] in the West Indies and in the United States [...] as regards health, food and clothing [...] and better provided for than were those

oppressed and degraded children and workpeople in the home manufactories of Great Britain. (Owen, 1857, pp. 112-3)

There was little change in the legal conditions of child employment until the 1833 Factory Act prohibited employment of children under nine, and restricted the hours for those aged nine and up to thirteen years to nine hours per day.

During 1800-1813 there were two buy-outs at New Lanark from each of which Owen grew richer through capital gains and maintained his position as Managing Partner.

The immense profitability of the New Lanark Twist Company during the period of Owen's management was illustrated by the fact that "between 1810 and 1813 it recorded a profit of £75,771-12s and 3d." (Paul McQuade, 1995, p. 3). In each of his first two partnerships, his partners were opposed to Owen spending any money to educate the young workers. In 1813, he resigned from the second partnership. Owen's advocacy of child labour reform, and his personality and writing then allowed him to attract an extraordinary group of six rich and philanthropic people to join him in a partnership of 13 shares, each of £10,000, to make the third and final Mill take-over of his time. Owen let it be known to the new investors that he expected to pay a five per cent dividend on capital invested in his new company, and that

the surplus gains shall be freely expended for the education of the children and the improvement of the workpeople at New Lanark, and for the general improvement of the condition of persons employed in manufactures." (Owen, 1857, p. 95)

Owen elected to keep five shares for himself and with his six new partners he won the auction for the New Lanark Mills on 31 December, 1813, paying £114,100. (Owen, 1857, p. 91) During the time the six remained directors, Jeremy Bentham and John Walker never visited the Mills. [Refer to Note 2]

8.7 Illustrations of the New Lanark Mills and The 1816 *Institution for the Formation of Character*

The following illustrations are "from a contemporary engraving." The four mills, each with its 6,000 spindles, stretch along the river.

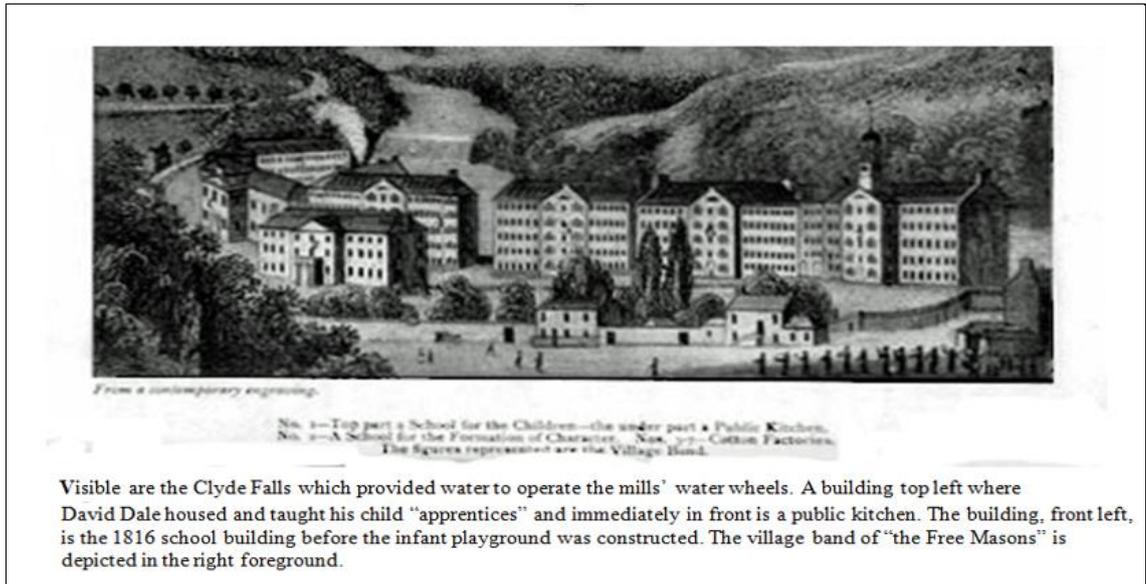


Figure 8.1 *New Lanark during time of Robert Owen*



Figure 8.2 *1819 institution for Formation of Character*

On January 1, 1816, the year following the battle of Waterloo, Robert Owen opened the new school building for his Mill employees and the children of both the New and old Lanark villages. He named it *The Institution for the Formation of Character*, which precisely expressed his purpose. The new school had about four to six hundred students spread over day and night classes: initially a hundred in the infant school for children aged two to five years; two hundred in the elementary school and about one hundred in the evening school available to mill workers aged ten to twenty. However, the opening of the new school coincided with Owen reducing mill working

hours of all workers by one hour a day, to 10³⁴ and the numbers attending the evening school rapidly rose to outnumber those attending the day schools. Owen reported later in the year to a Government Select Committee on Education that the average daily attendance was 622. Podmore (1906, p. 136) presented the following table in Figure 8.3 which shows a total enrolment of 759 students. The number of evening students had increased considerably during the year following Owen’s cut of one hour a day – without a reduction in wages.

Day school		Evening school	
Boys: 3- 6	41	Boys: 10-15	124
6-10	104	15-20	49
		20-25	1
Total	145	Total	174
Girls: 3- 6	39	Girls:10-15	220
6-10	90	15-20	52
		20-25	39
Total	129	Total	311
Total	274	Total	485

Number and age of students at the Institute for Formation of Character in 1816 Source: Podmore, p.136

Figure 8.3 Number and age of students at the Institute for Formation of Character in 1816

Parents of children in the elementary school paid threepence a month for each child “to prevent them,” said Owen, “regarding the Institute with the feelings connected with a charity school.” They paid nothing for their children to attend the infant school and the evening school was free for mill workers. Such contributions as were paid “amounted to less than one-twentieth part of the expenses” (Owen, R.D., 1824, p. 34). “The annual cost of running the schools in 1816 was £700, £550 for the headmaster and ten assistants, and £150 for materials, lighting and heating” (Donnachie, 2003, p. 11). No allowance was made for rent or depreciation.

Lesson times for the children over six years did not exceed 45 minutes and they attended school for five and a half hours a day; in summer they had a three-hour midday break. The infants attended for two and three-quarter hours a day. In 1824,

Robert Dale Owen (1924, p. 6) referred to five hours a day for those aged six and over. After the day classes ended, the classrooms were cleaned and, as necessary, the central heating was turned on for the evening school.

There were plenty of excursions for the children into the surrounding countryside, and military drill in the school. The military drill, according to Owen's elder son, Robert Dale Owen, was to encourage the children to march from one place to another and to aid their deportment. Interestingly, in his *Third Essay* (1814), his father envisaged conditions in which individuals brought up in a spirit of love (or by extension of Owen's thinking, in their new communities, or "reformed nations") might be attacked by parties "ignorant of rational principles". Therefore, the boys at New Lanark schools should be given military training and, in due course, the British nation would abolish the local militia in favour of a permanent, national defence force of which the New Lanark boys would be the nucleus.

By 1817, Owen was well known nationally and internationally. Many accepted his open invitation to visit his schools and as many as seventy came every day. Owen (1857) described what they saw:

In their military exercises they went through their evolutions with precision equal, as many officers of the army stated, to some regiments of the line; and at their head in their marchings. The girls were thus disciplined, as well as the boys, and their numbers were generally nearly equal. (pp. 143-4)

Exceptional for the time, and very popular with the children, were the daily dancing lessons shared by the boys and girls and joined, as possible, by children from the infant school.

Dancing is taught, as a pleasant, healthful, natural and social exercise, calculated to improve the carriage and deportment, and to raise the spirits, and increase the cheerfulness and hilarity of those who engage in it. The dances are varied: Scotch reels, country dances, and quadrilles are danced in succession.

Owen described their dancing:

These children [...] seventy couples at a time in the dancing room, and often surrounded by many strangers, would with the utmost ease and natural grace go through all the dances of Europe

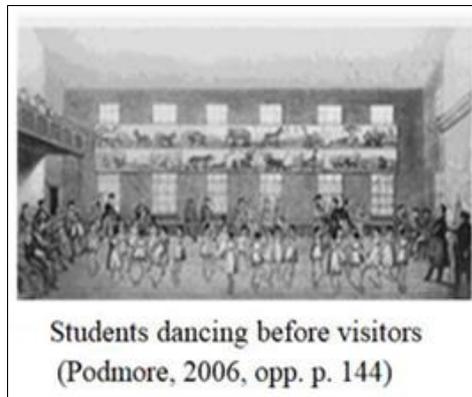


Figure 8.4 Students dancing before visitors (Podmore 2006, p.144)

And likewise, their singing:

In their singing lessons, one hundred and fifty would sing at the same time – their voices being trained to harmonise [...] with unaffected simplicity and heart feeling.

Fundamental to Owen's intentions was the ban on punishment in any of the three schools. Children were encouraged to see that individual happiness depended on happiness for all. Any child who upset others was regarded as ignorant not as "naughty". Owen's theory was that the ills of a capitalist society were perpetuated through parents' influence on their children which, naturally, reflected the behaviour of society around them. Owen's plan was to bring children as young as possible into his nursery school, away from the influence of their parents, and show adults the admirable behaviour that children achieved in their day-time community of love and co-operation. His wider plan was to develop self-sustaining, happy communities throughout Britain, each of one or two thousand people that would attract bosses and workers and through their co-operative example, gradually change the capitalist to a socialist society. The key to Owen's dreams was to educate the young to acquire his vision, and then to use that key to sustain his proposed communities. G. D. H. Cole summarised Owen's plan for alleviating the poor during the great depression that started in England in 1816, after the Napoleonic War:

He [Owen] proposed that, instead of paying out doles, the Government should employ the poor in "Villages of Co-operation" modelled on his own establishment at New Lanark and, like it, essentially centres of social life and rational education as well as of centres of productive activity. These "villages" Owen suggested, should in the main be self-supporting. They should be agricultural as well as industrial, and should raise the produce needed for their own

consumption, exchanging their surplus production [...] one with another. [...] they would be based on rational education, [...] would co-operate not compete with each other [...] and aim at producing good citizens and relieving the poor. (Cole, 1927, p. xiii)

Owen, as a businessman with experience of workers, had been invited to join the Archbishop of Canterbury's relief committee to consider how to alleviate the effect of the great depression. In 1817, he presented his ideas, as succinctly described above by Cole, to the Archbishop's Committee; and on 14 August to a well-attended public meeting in London. Owen also distributed copies of newspapers which reported his speeches throughout England, at high cost. [Refer Note 3] After much soul-searching and a séance with the spirits of famous people and deceased family members, Owen felt, regardless of consequences, he had to tell his truth – that social progress would not occur unless the religions of the world changed their opinions about the nature of man and admitted that society itself was the cause of social ills. He recalled that at a second public meeting in London on 21 August, he said:

All the Religions of the World (Owen's italics) are based on total ignorance of all the fundamental laws of humanity, and of the facts of undeviating perpetual occurrence. [...] all religions are based on the false notions that man makes his own qualities of body and mind. (Owen 1857, pp. 206-7)

His speech lost him the support of the editor of *The Times* who had argued Owen's idea of assembling the unemployed and their families in co-operative communities should be tried; it also led to the Church hindering shop sales of his publications. (Owen, 1857, p. 201)

The strength of Owen's self-advertising in 1818 on which he said he spent the prodigious sum of £4,000 rattled the British Government which feared he might precipitate a revolution. Lord Lansdowne, the Prime Minister, was much relieved, according to Owen, when Owen asked only that members of parliament should endorse people reading his speeches. [Refer to Note 4].

8.8 The Institute curriculum.

Owen's teaching methods and course of studies were far in advance of those provided by the Sunday Schools, the National, British or parish schools of the time. Owen's son, Robert Dale Owen in 1824, provided details of the 1816 school. The infant school was for two to five-year olds though some were admitted at eighteen months. The elementary school was for six to twelve-year olds though parents

withdrew many at age ten to work in the mills. The classrooms had been designed for monitorial teaching of large classes. The Owens realised that was a mistake as they found classes were more efficient with only twenty to forty students. Up to six years boys and girls were taught together. Over six they were taught separately; there being two classes of each sex, each with its own teacher. Additionally, there were specialist teachers for singing and dancing, drill and sewing. The subjects taught to the six to twelve year-olds were reading, writing, arithmetic, drawing, natural history, geography, ancient and modern history, religion, science, drill, singing and dancing and also for the girls, sewing, dress-making, and knitting. As far as possible, teachers illustrated all subjects with examples familiar to the children and blamed themselves if the children lost interest. They could use no corporal punishment; they were friends to the students and followed the students' interests wherever possible. They encouraged movement during lessons and aimed to make all lessons interesting to the children.

An important subject was derived by ingeniously combining history and geography. The children were first taught about the earth's movements relative to the sun and helped to get some impression of climate conditions in relation to latitude and longitude. Then geographic and historical information about countries was gradually added using maps and charts mounted on wall-rollers and large hemispheres showing longitude and latitude and unnamed landmasses. Thus the children learnt from a country's location:

For instance, whether it is fertile, or a desert; what is the colour and general character and religion of its inhabitants; what animals are found there; when and by whom it was discovered; what is the shortest way to get there from England; the name of its principal city, and of its principal mountains and rivers; and perhaps relate something of its history, or a variety of anecdotes which [the teacher] may have heard regarding it. [The children] can thus travel the whole world, taking all the principal countries in rotation. (Owen, R.D., p. 52)

This world-knowledge subject was taught through the student years from the age of six, presumably more information was added year by year. It preceded by half a century one of the elements of education that Thomas Huxley desired for his ideal school:

Let every child be instructed in those general views of the phenomena of Nature for which we have no exact English name. The Germans [call it] "Erdkunde" ("earth knowledge") – a general knowledge of the earth and what is on it, in it, and about it. (T. H. Huxley, 1869, after-dinner speech to the Philomathic Society)

Visitors in the galleries watching this lesson might see a class turn it into a game in which students in turn would point to a country and demand class members to state its name and other details. Robert Dale Owen described this cross-subject teaching:

The intimate connexion between Natural History, Geography, and History, is evident, so that in lecturing on one of these subjects, the teacher finds many opportunities of recalling to the minds of his pupils various portions of the others. (Owen, R. D., 1824, p. 52)

The class room aids described by Robert Dale Owen included:

- Pictures of “the most interesting examples” from the “animal, vegetable and mineral kingdoms ... “carefully drawn on a large scale, and as correctly as possible [...] otherwise the child’s idea of their relative size becomes incorrect.”
- Charts, which for each of seven nations listed the principal historical events, century by century.
- The hemispheres as described above. (Owen, R. D., 1824, pp. 45-46)

These aids allowed a teacher to locate the children in country, geography, and historical time and to introduce further information interesting to the children. The teachers could moralize on the influence of time and circumstance in developing people’s social behaviour. For example, the teachers encouraged the children to discuss how they would have behaved had they been born into a tribe of head hunters or vegetarians. The syllabus content was taught scientifically, emphasising reason, the use of analogy, and the need for corroborative evidence. Not that those terms were prescribed for the teachers, rather, Robert Dale Owen gave examples or described teaching methods. For example, teachers explained to the children the reason to seek evidence for historical statements. They were told they should not accept an explanation unless several writers agreed about it. The older children were given formal ideas of scientific knowledge without teachers using scientific terms. For example, features of the earth surface were discussed; the attraction between bodies was explained (“the force of the attraction always depends on the closeness of the bodies, and on their size” without using the term “gravitation”); the idea of elements or “simple bodies” compounded to form most things in the world and subject to decomposition by man – but difficult to reassemble in the case of living things; the differences between the animal, vegetable and mineral kingdoms; notions of food and life, circulation of blood and importance of minerals as food; how living things move and think; sensory impressions and how our bodies receive them. The children were given general definitions of terms such as Arts and Sciences and an

idea of what was done under the terms: astronomy, geography, mathematics, zoology, botany, mineralogy, agriculture, drawing and music. Attention was given to the activities conducted as “chemistry” and to specialist “languages” such as arithmetical signs, musical notes and signs “but these are not real knowledge. We only learn them, that we may be able to acquire knowledge by means of them”. The final thought listed for these older children was that all sciences and arts were developing every day. (Owen, R.D. 1824, pp. 82-103)

The spirit of Owen’s infant school spread through the whole school and the children’s friendly and helpful attitude to each other was remarked on by many of the 20,000 visitors the school received during 1816-1825. “The visitors included [Royalty] from Austria [and Russia], Foreign Ambassadors, many Bishops and Clergy innumerable, almost all our own nobility, learned men of all professions from all countries - and wealthy travellers for pleasure or knowledge of every description.” (Podmore, 1906, p. 172) The visitors included Grand Duke Nicholas of Russia, who visited New Lanark with his sister, the Duchess of Oldenburg, and his suite on 26 December, 1816. Podmore (1906, p.173) provided the following information: Nicholas “went all round the mills asking questions and seeming to be unaffectedly interested in all that he saw and heard.” Nicholas stayed the night at the Owens’ home, near New Lanark where, according to Owen, Nicholas was so impressed with one of the Owens’ youngest sons that he offered to take him back to Russia and raise him in the Court. The Owens declined!

8.9 Opposition

8.9.1 Directors (1814)

The terms under which Owen gained his six philanthropic directors in 1814 ensured he could spend company money on employee education; they did not protect him from opposition to what some of them saw as a lack of Christian principles in his system of “rational education”. Owen who opposed children making decisions about religion until they were of sufficient age to understand what they were doing, at the insistence of his new directors – and parents – introduced Bible readings and taught the Catechism of the Church of Scotland, probably in 1816 or 1817 (Podmore, 1906, p. 138).

8.9.2 Manufacturers (1815)

Owen in 1815 surveyed the working conditions of children in textile mills and talked to manufacturers about the then import tax of four pence per pound on raw cotton which, according to Owen, on his recommendation, the government reduced to a fraction of a penny. That valuable gift to the manufacturers did not influence their attitudes against any reduction in child workers' hours and they effectively destroyed a bill to that effect which the Government had allowed Owen to draft (Owen 1856, pp. 114-121).

8.9.3 The Church (1818)

In 1818 Owen found time for many things other than mill management, which he delegated to the managers of the four mills. In summer, Owen travelled for six weeks with Pictet, an influential Swiss scientist. They met scientists in Paris, attended the French Academy "and conversed with many of the most distinguished men and women in Paris." (Podmore, 1906, p. 252) They were joined by two of his wife's younger sisters and travelled by coach through the Jura Mountains to Geneva. Owen visited the schools of Oberlin, Pestalozzi and Fellenberg and explained his theories to them; visited other famous people and continued to Frankfurt-Am-Main where in September and October he composed two Memorials setting out his social principles; "one dated September 20 addressed to the Governments of Europe and America; the other dated October 22, to the Allied Powers assembled in Congress at Aix-la-Chapelle [today, Aachen in Germany]" (Podmore, 1906, p. 253).

After attempting to present or arranging for his Memorials to reach the heads of Government assembled to discuss France's relations with other powers following the Napoleonic Wars, Owen returned to England to find his books were no longer to be obtained at major booksellers. He noted: [They, the booksellers] "were warned by the supposed friends of the church, that if they sold Mr. Owen's works, they should not sell any of theirs" (Owen 1856, p. 201). Owen said (p. 202) that this censorship continued over his next 30 years; only poorer types of booksellers would sell his works and he had to become his own publisher.

8.10 The end of Owen's curriculum

Owen's schools continued happily enough until 1824 when, finally, the Quaker directors could no longer stand what they saw as the paganism in Owens' schools. By then, Robert Owen was losing his interest in the schools; partly because of the Quaker directors' complaints and hassling by local clergy, and partly because his interest had moved to a communitarian experiment in America. Podmore (1906, pp. 155-160) explained that the Board sacked him as Managing Partner. William Allen, the most prominent Quaker among the partners, stopped the dancing, singing, drawing and music classes. In their place he introduced hymn singing and religious music. He made the boys from the age of six give up their simple tunics to wear trousers. He replaced Owen's rational education with Christianity by deciding the curriculum would be changed to that of the British and Foreign Schools Society. Much of the fun departed from the New Lanark schools. "One redeeming feature," according to Gordon (1994), "was that Allen introduced lectures in chemistry, mechanics, and other scientific subjects." We do not know if Owen's attempts to present the abstract ideas associated with the scientific method were also stopped.

About 1822, Owen's eldest son Robert Dale Owen who had returned to England from his four years at Fellenberg's senior College at Hofwyl, in Switzerland (Owen, 1874, Chapter V) was now in charge of the Institute. He had not agreed with his father's rationalism and perhaps was comfortable with Allen's changes because in his 1824 book extensively cited in this Chapter, he emphasised that the Institute's principles continued but that parts of the curriculum were experimental and changes were anticipated. Podmore (1906, p. 157) arguably thought that the "great educational experiment" had not ended but been "transformed;" that its education was the sounder for becoming "more moderate." And some of the fun returned, though whether as part of the school curriculum or as an adjunct to it, Podmore did not know. The fact was, he said, that for many years there was dancing at the school every morning from 7.15 to 8.00 a.m. The New Lanark day schools continued to 1879 when they were replaced by a Government Board school.

8.11 Notes to Chapter 8

Note 1: Owen's social reforms at New Lanark

Owen was well aware of the importance of his social reforms among the inhabitants of New Lanark for the success of his 1816 school. When in 1800 he took over New Lanark from David Dale he found the town permeated by theft of Mill property, drunkenness among managers and the behaviour of ill-assorted people:

The people had been collected hastily from any place from which they could be induced to come, and the great majority of them were idle, intemperate, dishonest, devoid of truth, and pretenders to religion, which they supposed would cover and excuse all their short-comings and immoral proceedings. (Owen, 1857, p. 57)

Rather than head-on action such as initiating prosecutions, Owen changed the managers and, quietly, not to upset his partners, improved the workers' living conditions "to supersede the inferior and bad characters created by inferior and bad conditions, by superior and good characters to be created by superior and good conditions." (p. 68) His father-in-law had built the village of New Lanark to attract workers to his first mill built in a comparative wilderness. It had simple housing. Owen added an upper floor to the original homes. He supervised the mill shops to ensure they offered reasonable quality goods at fair prices. He controlled the liquor sold in the village and as he was the only employer for the villagers he could punish drunkenness. He ensured that hygiene was maintained in the village. Additionally, for four months in 1806 an American embargo on its cotton exports forced British mills to close. According to Podmore (1906, pp. 84 & 93) Owen endeared himself to all the villagers by persuading his partners of the day to continue to pay workers' wages, amounting to £7,000, during that period. In 1816, coincident with the opening of the Institute for the Formation of Character, Owen reduced mill working hours from 11^{3/4} to 10^{3/4}.

Note 2: The 1814 Directors

In Glasgow, on 31 December, 1813, Owen and his new partners won the New Lanark establishment at auction for £114,100. They completed formalities during the next three days. On 4 January, Owen with two of his new directors, Joseph Fox and Michael Gibbs, travelled by coach to New Lanark. They came first to the old village of Lanark where they were greeted by cheering crowds. Men unhitched their horses and took their place. They were pulled further to Owen's home where Mrs Owen and her two sisters were summoned to the coach that was then pulled the next quarter-mile to New Lanark and along every street in it, to further jubilation.

In Owen's words (Owen 1857, pp. 95-6) his six new directors were:

John Walker of Arno's Grove, Quaker (3 shares): "A most disinterested benevolent man, highly educated, very rich and highly educated, possessing great taste in the arts [...] well-versed in the sciences and a perfect gentleman [...]"

Joseph Foster of Bromley, Quaker, (1 share) "a universal peacemaker who, apart from Walker, was less a sectarian than any of the Society of Friends known to me."

William Allen, “the well-known Quaker, of Plough Court, Lombard Street. (1 share) He was active, bustling, ambitious, most desirous of doing good in his own way, (as a large majority of Quakers are), and had kind feelings and high aspirations; but he was easily impressible, and was therefore much more unsteady in mind and feeling than the two preceding partners. He was however at this time popular, and a great favourite among his sect, and one of its chief leaders. He had one share allotted to him, - for his friends John Walker and Joseph Foster were very desirous that he should join our party.

“The next who applied for a share was Jeremy Bentham (1 share), who spent a long life in an endeavour to amend laws, all based on a fundamental error, without ever discovering this error; and therefore was his life, although a life of incessant well intended industry, occupied in showing and attempting to remedy the evil of individual laws, but never attempting to dive to the foundation of all, and thus ascertaining the causes of the errors and evils in them. He had little knowledge of the world, except through books, and a few liberal-minded men and women. A nervous temperament [...] hermit-like.”

Joseph Fox, a dentist, (1 share) Fox was “a friend of William Allen - a respectable, well-intentioned dissenter, of some denomination [Baptist], from the Church of England. The last share was given, at the urgent request of the last named, to his relative, Mr Michael Gibbs, subsequently the well-known Church Warden, Alderman and Lord Mayor (of London),- a Church of England man, a conservative, and a man, as I believe, of good intentions, fair abilities, and business habits.” During the time while the six remained directors, Jeremy Bentham and John Walker never visited the Mills.

Note 3: Robert Owen’s publicity in 1817

Owen spread his opinions widely in 1817. Writing of his public meetings in London: The proceedings connected with this announcement of a new system for governing the affairs of men, excited so much interest in the public mind, that in addition to their publication *in extenso* in every London morning and evening newspaper, I generally purchased *thirty thousand* (Owen’s italics) additional copies, and had one copy sent to the minister of every parish in the kingdom, - one to every member of both houses of parliament, - one to each of the chief magistrates and bankers in each city and town, - and one to each of the leading persons in all classes. [...] I found that these meetings, and giving them the extra publicity necessary for the great ultimate object which I had in contemplation, had already in two months required from me four thousand pounds – newspapers then costing seven pence or eight pence each (Owen 1857, p. 156)

In this precursor of a modern direct mail campaign, Owen tantalisingly does not tell us who compiled the address lists, who wrapped and addressed the newspapers or the postage costs.

Note 4: Government reaction to Owen’s publicity

The above description of an Owen mass-mailing applied to the one of August 15, 1817. The volume for postage was so great that “all the mail coaches of the kingdom

had to be delayed twenty minutes beyond their regular time of leaving London” (Owen 1857 p. 157) This massive breaking of postal contracts and indication of his great popularity, according to Owen, “seriously alarmed the government”. He met the Prime Minister, Lord Liverpool, on August 20 and felt “he had the government at his mercy.” (p. 158) Not that he sought such a position. Owen recorded that he asked only that if his resolution at the public meeting the next day were carried that his opinions should be examined, the Prime Minister and Cabinet should be on the committee of enquiry, together with an equal number of the Opposition. Owen recorded Lord Liverpool readily agreed, and was most relieved. (p. 159)

8.12 Summary Chapter 8

- Robert Owen was a self-made capitalist. He learnt the textile trade through three appropriate apprenticeships, learnt to make and efficiently operate cotton-spinning machinery, became manager of a Manchester spinning Mill; then managing partner of the New Lanark Mills from which he made fortunes through successive take-overs.
- In his adolescence, Owen developed the idea that the family and society were the important conditioning forces in people’s lives which together with organised religion, imputed free will to people. Hence society could punish them for offences against society. Owen argued that to improve society, young people, the younger the better, should understand that society itself was responsible for crime. A society, such as a school, if conducted in love, kindness, and reason could eliminate anti-social behaviour, without punishment.
- Owen’s first two sets of partners objected to any of the Mills’ profits being spent on schooling for the Mill workers and their children.
- The third set of partners included rich people and influential Quakers. They agreed to accept dividends of only five per cent on their investments and that the balance should be spent on education and furthering the liberation of child workers.
- The resultant education at Owen’s 1816 School for the Formation of Character was astoundingly superior to that of the education available for poor children in factory areas. Many subjects were taught, including science and the teachers encouraged the students to apply scientific method to new

material presented to them. Subject boundaries were broached to give the children a wide picture of the world, past and present. Teachers were friends of the children. There were no punishments. Science and open enquiry were taught as part of a comprehensive curriculum. For Owen, the purpose of the school was to produce adults well suited to live in co-operative communities and, as necessary, to defend them. For the 20,000 visitors the school attracted over a nine-year period, it was an example of a school, extraordinary for its age, associated with model mills with model working conditions and a model village.

- His ideas for social progress early in the nineteenth century attracted the attention of intellectuals, parliamentarians, newspaper editors and royalty in Britain, France and Russia but their public consideration was restricted by industrialists who considered their adoption would reduce profits and orthodox church-goers and functionaries who saw his ideas as attacks on accepted faiths. His Quaker directors dismissed him from his schools in 1824 and expunged his “pagan” practices from the curriculum.

Chapter 9

RICHARD DAWES AT KING'S SOMBORNE IN 1837-1849

OVERCOMING CLASS DISTINCTION WITH SCIENCE

I can scarcely conceive a system of education working well in all its bearings, in which people themselves are not made to pay for it – I mean such payments as may reasonably be expected from them – it is difficult on the voluntary system, to get the parents out of the idea that they are not doing all this, and sending their children to school, to please somebody else, and not for their own good. (Dawes, Hints, 1847a, preface to 3rd edition)

9.1 The educational and social purposes of Richard Dawes

Rev. Richard Dawes (1793-1867) academic, university college business manager, and Church of England priest developed teaching methods and a school structure in a nineteenth century English parish school. He sought to improve the education of village children; farmers' and labourers' alike; modify social class attitudes; and develop a single system of schools, country and city, which would be attended by middle-class and working-class children. In his classroom teaching he emphasised English and arithmetic and discussions of everyday objects familiar to children. He integrated the content of various subjects. He used science to attract parents of "the classes immediately above the labourer" to send their children to his school. (Dawes, 1847a, p. 51) Dawes was critical of the standard of education provided by the National Schools with which his school at King's Somborne was affiliated. [The National Schools' statistics were challenged – Chapter 5 Note 1] He worried that during his time at King's Somborne the Government subsidies that were being issued in England and Wales to assist the education of the poor would further class division by creating an exclusive system that would not be appreciated by the poor and would be spurned by the middle class. Dawes considered his system would save middle-class parents much of the cost of sending their children to private schools which, he thought, provided an inadequate education and their children would get a better school experience at the schools he expected to develop. Dawes demonstrated at King's Somborne that by charging parents fees according to their ability to pay, his school could cover its running costs and not be reliant on Government support. Dawes achieved outstanding results in student engagement and educational attainment and attracted middle-class students in due proportion to their community percentage. His aim was to overcome one aspect of the class system: the social and

economic relationship of employer and employee. In the rural district of King's Somborne his concern was with farmers and their labourers. Science was to attract farmers to have their children share the one school with their labourers' children where they would receive the benefit of a broad curriculum, well taught. Dawes was appointed Dean of Hereford in 1849 and clergy in a few districts tried to follow his system but with little success. By the year of his death in 1867, his King's Somborne School had reverted to a parish school, normal for its time.

9.2 Richard Dawes comes to King's Somborne

In 1837 Richard Dawes, aged 44, became the Rector of King's Somborne, a small parish near the market town of Stockbridge in Hampshire. Dawes and his wife, Mary, arrived to occupy a fine, Georgian vicarage. Inspector Moseley (1949, pp. 5-6) described the village as poor. It was 7,500 acres (11.7 square miles) and included 1,125 people, most of whom lived within a mile or so of their church. The population was wholly dependent on the activities of five or six farmers who grazed sheep or grew cereal crops. Labourers were paid six to nine shillings a week but may not have been employed full-time. They paid 50 to 100 shillings a year to rent their cottages. The only employment for women and children was on the farms. There were two dame-schools for the whole area, and no elementary school. Important to the author's argument, presented later in this chapter that Dawes's circumstances were exceptional, is Moseley's statement:

There is no squire or other person resident in the place above the condition of the farmer, except the rector. Neither is there any indirect influence of non-resident landlords or neighbouring gentry favourable to the schools, to account for their success. (Moseley, 1849, p. 5)

Or one might add, to hinder it! Dawes was an ideal person to come to King's Somborne at that time. He was highly educated and had had 18 years' business management experience controlling the finances of Downing College, Cambridge during which time he increased College income from its farmer tenants. His personality, according to Henry (1867, p. 8) was congenial to all types of people; he had sympathy for younger members of social groups in which he was involved and he spoke kindly to all. The timing of Dawes's arrival in King's Somborne was opportune for developing his parish school as by 1837 a Committee of the Privy Council was distributing funds for new school buildings (see Chapter 3, Table 3.1).

In October 1842 Dawes inaugurated his new parish school in which to apply his views. Within five years Dawes's school had 185 students, about a quarter of whom were children of farmers, craftsmen and tradesmen and the other three-quarters were from homes of labourers (see Table 9.1). His school provided a range of subjects uncommon in the schools of the day. There was an advanced class for boys proficient in English and arithmetic in which they were taught geometry, algebra, physical science and agricultural chemistry, all in a practical manner. Teachers also taught a general science subject, in Dawes's words, "according to the philosophy of common things" (Dawes, 1847a, p. 10). All students were highly engaged by the school curriculum and the standard of teaching was attested to by an average daily attendance of 89 per cent, with 31 per cent of the boys staying beyond the age of 11; a few even to age 15. Dawes's plan extended beyond creating one successful school; he aimed to build a school system which would achieve his objectives: to mitigate class differences and to use science, well-taught, as his instrument to attract children of middle-class parents to share their schooling with labourers' children.

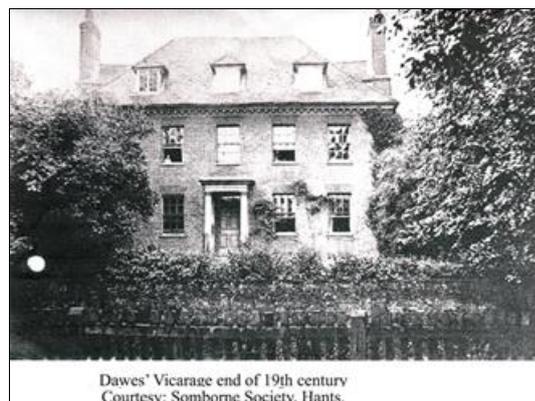


Figure 9.1 Dawes' Vicarage end of 19th century

9.3 The education of Richard Dawes

Richard Dawes was born in 1793 to James and Isabella Dawes, in Hawes, Wensleydale, West Yorkshire. His father "possessed a freehold estate of about 300 acres" (Henry, 1867, p. 5). There is no account of Dawes's elementary schooling. We may surmise he first attended a local elementary school before moving to Ravenstonedale Grammar School, Westmoreland, 17 miles on today's roads from Hawes. (Venn, 1944, p. 254) There he was educated under Dr. John Robinson, D.D. who was also the Ravenstonedale parish Rector, an historian and author. In 1806,

when Dawes was 13 and could have been attending his school, Robinson published *An Easy Grammar of History, Ancient and Modern* and in the following year two school text books, *Ancient History* and *Modern History* (Rigg, 2004a). Considering his headmaster's interest in more than ancient history, it could be supposed that Dawes's secondary education might not have been purely classical.

Dawes matriculated for Cambridge University entrance in the Michaelmas (autumn) term of 1813 (*Ancestors*, a proprietary genealogical family history tracking programme.) For the two previous years, 1811-12 and 1812-13 he had been tutored in mathematics by the blind polymath, John Gough, who was living near Kendal, about 27 miles from Dawes's home at Hawes. Janet Shepherd (2004) and Layton (1972) each refer to "the Quaker mathematician, John Gough" but Joseph Gross (2004) notes that Gough was expelled from the Quakers in 1800 for marrying before a priest and joined the Unitarian Chapel in Kendal. Dawes was tutored together with William Whewell, later to become Master of Trinity College. At Cambridge, Dawes showed his academic brilliance by gaining high matriculation results. According to the Cambridge University Alumni 1261-1900, he entered Trinity College as a *sizar* (a financially assisted student); completed his B.A. in 1816 and his M.A. in 1817, coming fourth in the first class honours list ("fourth wrangler") (Venn, 1944). He was elected a Fellow of Downing College and became its Bursar and Mathematics Tutor. He was ordained a Deacon of Ely in 1818 and in the following year, Vicar of Tadlow, where the College lands were situated. Dawes held that position until 1840. Henry (1867,p.8) cites Alfred Power, a former fellow of Downing, whose descriptions of Dawes included the phrases: "his genial humour and exuberant spirits" when entertaining his academic friends, "his warm encouragement to younger people to take part in conversations" and "nothing unkind or bitter is remembered ever to have fallen from him". He had active and friendly relations with the tenants of Downing College's land, and his business management turned the College losses into credit. However, Dawes incurred conservative opposition because "he had voted with Professors Sedgwick, Henslow, and a few other distinguished men for admission of Dissenters into the University" (Henry, 1867, p. 10). When a vacancy opened for Master of the College, a position controlled by conservative members of the Church of England, despite the 18 years he had served

Downing, Dawes's sympathies with dissenters destroyed his chances and he retired from his posts at Downing College.

Dawes's skills were re-directed when "in 1837 he was presented by Sir John Mill, who had been one of his students at Downing, to the valuable rectory of King's Somborne" (Henry, 1867, p. 10). According to Layton (1972, p. 40), when Dawes left Cambridge to move to King's Somborne, there was "no hint he had given serious thought to educational problems", and yet, "he was noted as a man of liberal views and independent thought [...] and had close contact with many of the most eminent scientists and mathematicians of his day". It seems reasonable that education and Robert Owen's views on a new society would have been discussed in the Downing College common-room and earlier, during 1813-17 while Dawes was a student of College. As discussed in Chapter 8, Robert Owen in 1817 was promoting his views at post-haste speeds into every influential corner of England.

9.4 The parish school of King's Somborne

Dawes's school succeeded in achieving that "much stronger hold on the affections of the people of all classes" through his personality, teaching and curriculum. Elements of his school curriculum included freedom of belief for students, secular lessons with non-religious class materials, subjects based as far as possible on things and ideas common to children, knowledge not limited by subject walls, science as a tool to attract the children of farmers, craftsmen and tradesmen and science as an essential subject for all. Overall, Dawes sought to supply a higher education to increase children's feelings of self-worth and equip them for wider job opportunities.



Figure 9.2 Dawes's school about 1900

Dawes opened his school on an acre of land adjacent to his thirteenth century parish church of St. Peter and St. Paul. To build the new boys' and girls' schools and the

schoolmaster's house, Dawes raised funds from several sources: the recently established Government Council on Education, the National Society with which the parish school was associated, and also, as he noted, "the Diocesan Board at Winchester, and by subscriptions from myself and others connected with the property of the parish" (Dawes, 1853, p. 2). The latter was a modest statement as Henry (1867, p. 12) wrote that Dawes contributed no less than £500 himself. The school was built for 110 children at a cost of £900 according to a plan supplied by the Government Council of Education.



Figure 9.3 Dawes's original school in use today as part of a modern elementary school (Candidate photo, October 2011)

Dawes opened his school with 38 children and its numbers grew rapidly. There were, on Dawe's figures, 106 by the end of the first year and, successively, 110, 144, 158 and 185. The 185 were divided between a boys' school with 92 students attended by a master and an assistant master; a girls' school with 93 students attended by a mistress. At the end of the fourth year, one of the village dame-schools was incorporated as an infant school with 34 students. It was attended by a mistress, and conducted in an adjacent cottage (Dawes, 1847a, p. 13).

Dawes had few staff as he conducted his school according to the monitorial system. At the end of the fifth year with about 185 students he paid his staff: "Master and Mistress, man and wife, £70 a year with a house and garden; a second Master \$30, and four pupil-teachers apprenticed to the school, fees not stated." (Dawes, 1847a, p. 14) Dawes did not say if he employed an extra teacher when in 1845 he opened his laboratory class though the wife, Mrs Mary Dawes, frequently assisted the teachers in the girls' section (Piggott, 1992, p. 13).

Dawes charged labourers two pence a week for one child at school and a penny a week for each extra child; that is 24 pence for one and 12 pence for each extra child per quarter (reckoned as 12 weeks' school time). He charged farmers and tradesmen in the parish six shillings (72 pence) a quarter per child and those from other parishes ten shillings (120 pence) per child per quarter (Dawes, 1847a, p. 13). This charging according to means was essential for Dawes to cover the school's running costs though it worried Inspector Moseley (representing the Government education body) that "Mr. Dawes claims the right himself to decide who are the farmers to pay the highest fee and who the tradesmen and labourers." (Moseley, 1849, p. 27)

Moseley softened his opinion with the thoughts that within the school there was absolute equality between all the children irrespective of their parents' occupations, and that to charge poor parents was to make them appreciate that education was worth paying for. Testifying to the strength that developed with parents' support and student enthusiasm was the fact that parents with few exceptions paid the fees without protest.

Dawes's school was affiliated to The National Society whose curriculum, as described by Hill in 1836 (see Chapter 2, §2.1) was "reading, writing, the elements of arithmetic and a competent knowledge of the Scriptures and the Church of England Catechism". But for Dawes "the Bible is not used as a textbook, as it is in some of our National Schools" (1847a, p. 23). For most of the week his teachers used secular books for their breadth of knowledge and low prices bought from the Irish National Schools Board. However, he said, "Great pains are taken to ground them (the children) in scriptural knowledge." (p. 23) Dawes explained that on Fridays the Lesson and the Psalms for the following Sunday [...] are read and explained to them and their exercise to write on a Friday night was generally a scriptural one" (1847a, p. 23). As he did not have time to conduct Sunday school regularly on Sunday mornings, he had his top classes come to the Vicarage for scriptural reading and instruction on alternate Sunday evenings. Inspector Moseley reported that all scholars, save those in the youngest class, engaged in written scriptural exercises, differing in this way from other National schools in which only senior scholars engaged in written exercises. From his tests of their knowledge, he gained a "very favourable impression." Moseley attributed that result to the interactive effect of the

students learning more subjects than those in other National schools (Moseley, 1849, p. 15).

9.5 The philosophy of common things

At the 1854 London Educational Exhibition at the Society of Arts, Dawes, by then Dean of Hereford, defined his “philosophy of common things” in terms of its purpose and method of teaching. It was more particularly to be directed to children in elementary schools “associated with the industrial classes” who, lacking the benefits of children with educated parents, were in “ignorance of the commonest things”.

By common things, I [...] mean branches of useful knowledge connected with industrial life which recommend themselves by their usefulness to all classes, and by the influence for good which they are likely to have on youth in after life. (Dawes, 1854, p. 4)

The ‘branches of useful knowledge’ included personal health and domestic economy; better buying of food and better eating practices which saved families’ money; likewise, avoiding purchases on credit. How homes are built and the materials used; materials for clothing and how produced; foodstuffs and their cultivation; the added value of labour in manufacturing; manufacturing processes; value of transport and its place in developing civilisation.

9.6 Dawes’s principles in practice

After the first two years of his school at King’s Somborne, Dawes was pleased with the progress and the standard being achieved which was much more extensive than he had anticipated. He noted: “I saw the importance of adding a class-room, not only for separate instruction for the more advanced boys, but as a room for several things in the way of school apparatus, which it was highly desirable to have.” The apparatus included ores of commonly used metals, raw and finished materials used in the textile industry, specimens of local timber and vegetable products, models of simple machinery, an air-pump, and a “few common hydrostatic things, in fact, anything of that kind which might interest or help in the purposes for which education is intended” (Dawes, 1847a, p. 18).

He discussed such things as why water could be ‘sucked-up’ through a straw, why a kettle lid rattles when the water boils, why a glass might break when hot water is poured into it. Dawes found such things “so excessively amusing to them, and at the same time so instructive, that I have scarcely missed a week explaining some

principle of this nature, and in questioning on what had been done before". He emphasised that for the children to understand the various principles "it was necessary to conduct experiments or demonstrate with apparatus; words alone would not suffice". He further wrote that by about 1845 his teachers were well qualified "to teach the mechanical principle of the tools they use [...] such as the spade, the axe, the plough [...] to explain such things as the common pump, barometer, pair of bellows; metals varying in volume, according to the quantity of heat which is in them [...], etc." (Dawes, 1847a, pp. 25-26). It was not clear from Dawes's writing if his teaching of "common things" was restricted to senior forms or applied, as appropriate, throughout the school.

In a lecture after he had left King's Somborne, Dawes (1853) argued that agricultural chemistry could advantageously be introduced to older students in schools such as his. He had introduced agricultural chemistry to King's Somborne about 1845 using "Professor Johnston's 1845 Catechism (of Chemistry and Geology) as a text-book, and sufficient apparatus for the experiments required to illustrate it" (Dawes, 1847a, pp. 31-33). It was a problem to find qualified science teachers but Dawes believed when society recognised the kind of education he was providing and science teachers were appropriately remunerated that the difficulty would cease. In autumn 1847, George Edmondson opened Queenwood College, four miles to the west of King's Somborne. Dawes promptly gained help from the College chemistry teacher, Edward Frankland, "who gave six lectures on agricultural chemistry at King's Somborne, attended by students, farmers, teachers and gentlemen of the district" (Layton, 1972, p. 43). Dawes said student interest in science at King's Somborne was such that ten or twelve of the biggest boys met on a Saturday with a master to study science, paying their own expenses. Two went two days a week to study in the Queenwood College laboratory (Dawes, 1853, p. 10) where Frankland supervised the teacher, Mr. Halstead (Frankland, Journal, 16 and 22 September, 1848).

9.7 Inspector Moseley's assessments

In the years 1846 and 1848, the schools were inspected by the Rev. Henry Moseley, "who gave a more complete examination of them than had ever been done before" (Dawes, 1853, p. 13). Henry Moseley, FRS, who was previously a science professor at King's College London, prepared his report for the Committee of the Council on

Education, which Dawes was permitted to reprint. Moseley described the Somborne children as:

Typical, healthy-looking village children, perhaps better clad than in other schools and cleaner. Every girl has been required to buy a hairbrush and comb and their hair is glossy and tidy. All the children have a toothbrush and are required to clean their teeth daily. Twice in every week every child is asked if it has washed its feet, and there is reason to believe that ablutions of this kind are general in the school (Moseley, 1849, p. 9).

Moseley explained that it was uncommon at that time for labourers ever to wash their feet. Moseley found that more than double the proportion of children was able to read with understanding and good expression than in other schools. The students also learned poetry and achieved a higher standard of spelling and arithmetic. Classes included English grammar, geography and English history. For half of each day the girls were taught domestic tasks which included needlework and dress-making using paper patterns. The teaching of all subjects was practical and based, as far as possible, on familiar things. Geometry, for example, was learned practically through measuring the dimensions of a classroom or a field; arithmetic exercises were included in grammar and in dressmaking lessons. English history was taught in discussions about the Roman road which ran through the parish. The children learnt poetry and singing, and sometimes gave evening concerts. Altogether, the children developed a great pride in their school and Moseley was thrilled to see the children taking books home in their satchels to support their evening tasks.

The sight was to me, as an Inspector, a new and very gratifying one. My thoughts followed them to their cottage fire-side. (Moseley, 1849, p. 18)

9.8 Relationship of school and home

Robert Owen (see Chapter 8, Note 2) was aware that for his 1816 school to function harmoniously within his worker community, he first had to provide harmony in the village itself; which he did by improving housing and living conditions. Richard Dawes extended the education of the villagers and involved them with his school activities simultaneously with the development of the school. His teachers set homework for the scholars, itself an exceptional act for the 1840s, which as far as possible involved practical examples that could involve parents and other family members. For example, how large an area could a man plough in a day; what the parish population would be in seven years at a growth rate of so many per cent a year; what was family consumption of sugar in a month and its cost per year at so

many pence a pound? Families became involved in these calculations which were relevant to their home circumstances. Parents who could not read listened with interest to their children reading or reciting poetry and took part in the children's homework. However, Moseley thought, one important thing was omitted from the education of the poor – to give them a say in the content of their children's education.

We break off a fragment from our own education, and give it to the poor man's child in charity. We consult neither his judgment in the matter nor his independence. We have no faith in his affection for his child, or in his willingness to make sacrifices for its welfare [...] if we find the poor but little benefitted by our schools; [...] let us remember that they have themselves had no choice in the matter; that in the education we offer to their children, the springs of opinion among them have never been considered, nor their wants consulted. (Moseley, 1849, p. 26)

9.9 Dawes's social views and practices

Dawes's feeling for social benefit through co-operative organisation was illustrated by the Clothing Club he introduced to his students. Each student contributed one penny a week for 48 weeks. To the four shillings thus accrued by each student, he added one shilling from his own pocket. He then greatly increased the value of the Club to students by buying the garments at wholesale prices. (Moseley, 1849, p. 9n) Dawes thought of other enlightened self-help schemes which would assist teachers and the teaching profession. He was aware that teachers from the new training schools gained accomplishments that allowed them to move out of teaching to take better-paid and white-collar work. Dawes's thought (1847a, pp. 46-7): "why not some system of superannuation after a certain number of years' service [...] be adopted, as an inducement to remain?" He also thought mutual benefit schemes should be planned to assist teachers in periods of illness or unemployment and that "the wages of the industrious labourer, in a healthy state of society, ought to be equal to all the decent wants and respectabilities of his station in life." (1847a, p. 11)

Additionally, Dawes established at the school a lending library which was well-used by the students.

9.10 Promoting a new system

Dawes wanted to remove the feeling of charity in parish schools, to break down class separation, and give each child a superior elementary education which would include science. Underpinning those aims would be the availability of science teachers and

the acceptance of such aims by the Church of England and *The National Society* school system with which his school was affiliated. To achieve his plan would require wide adoption of his new type of school – conducted to his “philosophy of teaching the common things”. He put forward two arguments for its ready adoption: others could do as he had done - he was neither exceptional nor acting within exceptional circumstances - and the King’s Somborne success demonstrated its experience was replicable by others. Dawes was too modest or, perhaps, ‘played down’ his experience and abilities to encourage others to follow his footsteps. His parish conditions were not ‘of an average kind’. He had the initial advantage that there was no one, according to Moseley, in or outside the parish to hinder his efforts – he was the community leader – nor was there any existing elementary school with an established organisation and curriculum that might have conflicted with his plan for a science-based and secular curriculum. Also, Dawes came to his position endowed with a high salary with which, as Henry (1867) indicated, meant he was able to pay a substantial part of his school’s capital cost. The other factor was Dawes himself. He was a highly qualified academic and experienced business manager who was thoughtful of other people, taught science to his teachers, encouraged the children for an hour or an hour and half a day and strongly opposed religious discrimination, even within a Church of England school system established to gain young adherents.

Moseley (1849) reported that others could argue that to reproduce the success of King’s Somborne in the particular circumstances of the time would require the skills of another Dawes. That was a reasonable conclusion but the successful King’s Somborne curriculum did not reflect just the attributes of its originator. It embodied a principle that others could follow and for which the training colleges could supply appropriately trained teachers. Moseley added a third and contradictory reason which supported the argument that Dawes was a special person. He wrote, “I see not why men, duly and specially educated for the office should not create everywhere the same confidence, [...] Nor why a mind such as Mr. Dawes’s should not control many such schools” (Moseley, 1849, p. 25). Moseley could, perhaps, have more fairly admitted that Dawes was a remarkable innovator who worked in favourable circumstances, and then argued that Dawes’s success at King’s Somborne and his

writings had changed the educational scene by providing examples of methods and outcomes which made it easier for others to emulate him.

Dawes's own figures do not support his statistical argument that his school was overcoming class distinction. He wrote:

The increase in the number of children who pay by the quarter (non-labourers' children) in each successive year, show very distinctly that the prejudice in the classes above the labourers, against sending their children to our National Schools, are gradually giving way. (Dawes 1847a, p. 14)

But the figures in Table 5.1 show that the numbers of labourer's and non-labourers' children were increasing over the years at the *same* rate. Dawes would better have based his argument on the fact that he was providing a unique education at a National School that each year was attracting non-labourers' children from further afield. He could not argue he was breaking a prejudice by non-labourers against *all* National schools. He could argue that from the opening of the school non-labourer households were quick to respond to the presence of a new school where one had not previously existed; that within the parish the number of non-labourer households remained constant and that the appeal of the school over the years widened geographically for non-labourer households – a tribute to this one school! Dawes included in the 1847 figures the 34 pre-school children he acquired in absorbing one of the local dame schools so that Dawes's 1847 figures were not comparable with those for the previous years. The adjusted figures in the bottom lines of the table raise the thought that by 1847 there were few local labourers' children not attending the school but the school's fame was still spreading among non-labourers in surrounding districts.

Table 9.1 King’s Somborne Parish School Students: 1842-47 (Compiled from figures in Dawes’s and Moseley’s reports)

Date		Total Table	Parents		Homes of Non-labourers	
			Labourers	Non-labourers	King’s Somborne	Other parish
1842 Oct.	no.	38	27	11	11	-
	%	100	71.1	28.9	100	-
1843 Oct.	no.	106	81	25	24	1
	%	100	76.4	23.6	96.0	4.0
1844 Oct.	no.	110	83	27	24	3
	%	100	75.4	24.6	88.9	10.1
1845 Oct.	no.	144	110	34	24	10
	%	100	76.4	23.6	70.6	29.4
1846 Oct.	no.	158	122	36	22	14
	%	100	77.2	22.8	61.1	38.9
1847 May	no.	219*	170	49	23	26
	%	100	77.6	22.4	46.9	53.1
1847 May (adj.)	no.	185	136	49	23	26
	%	100	73.5	26.5	46.9	53.1

*included 34 infants gained from a Dame-school acquired during the fourth year

9.11 Likely long-term effects

One argument used against Dawes when he was planning his school was that to educate labourers’ children would soon have them “treading on the heels of their betters” (Dawes 1847a, p. 4). Inspector Moseley sought to allay fears his readers might have about any dangerous social implications of Dawes’ school. Moseley argued that farmers’ children would gain more than those of the labourers because their fathers could pay for them to stay at school longer and because of their superior households they initially came to school with more knowledge than labourers’ children.

If, therefore, the farmers and tradesmen of King’s Somborne continue to avail themselves of the advantages offered by the school as zealously as they do now, it is no more to be feared that the next generation of labourers should be more in advance of them than the present thus, the higher classes of the school include labourers’ children in a less proportion than the school generally. (Moseley, 1849, p. 11)

Dawes could not have enjoyed hearing Moseley’s argument as it suggested his plan could accentuate not overcome class differences yet the figures seemed to support Moseley’s contention. By May 1847 there were 15 boys in the laboratory-class, girls not being admitted: seven were sons of labourers and eight of non-labourers: the seven labourers’ sons in the top class represented about eight per cent of their group

at school, and the eight non-labourers' sons thirty-two per cent of theirs. Dawes recorded no comment about these sharply differing proportions of farmers' and labourers' sons in his top class though, clearly, they represented a challenge for him to increase the proportion of labourers' sons in the next few years. That was not to be as Dawes was promoted to Dean of Hereford and left King's Somborne at Christmas 1849 or early in 1850. In his 1853 address to the Society of Arts Dawes described effects of his achievements at King's Somborne. They showed his principles were adopted successfully in a number of schools but in some the attraction was the opportunity to increase fees rather than wholeheartedly adopt his curriculum. The letter Dawes quotes from his successor at King's Somborne, Rev. Charles Nicoll, indicated a major problem was that his fellow Anglican clergy believed Dawes's system lacked religion. Nicholl himself was happily surprised "that it is possible to combine a high degree of general useful knowledge with the principles of a sound religious education." [see Note 3]

9.12 The fight to control the education of the labouring poor

In December 1849 Kay-Shuttleworth, exhausted from his work as administrative head of the Government's Privy Council Committee for Education, resigned and reluctantly accepted a Baronetcy (Smith, 1923, p. 223). It was as if Dawes immediately took up the fight against the Established Church's continuing opposition to State contributions to education, as in the following year Dawes issued a pamphlet, *Remarks occasioned by the present crusade against the educational plans of the Committee of Council on Education* (1850) in which he replied to the pamphlet, *Church Schools and State Interference* by Archdeacon George Anthony Denison, a leader of Church opposition to State action in education. (Rigg, 2004b) Dawes attacked clergy who wished to retain curriculum control at parish level. That, he said, would cause Anglican parish schools to revert to the charity system which separated the labouring poor from other classes of society – while retaining the cash benefits of the new system administered by the Government.

Any system left to the clergy alone would neither be well devised nor well carried out; they are in general too apt to view the education of the poor simply as a matter of charity – the poor themselves as objects to exercise kindly feelings upon, but who ought not to be elevated. (Dawes, 1850, p. 10)

Dawes (1850) described Denison as “the would-be liberator of schools from the thralldom of the Committee of Council” and to whom “much of this opposition, or, at all events, of the bitterness of it is to be attributed” (p.4). He listed the opposition as including Archdeacons Sinclair and Manning, the Archdeacon of Winchester, a sub-committee of the London Union on Church matters and individual clergy. One of the latter, a Rev. E.P. Vaughan, according to Dawes, said the Government Committee actions were examples “of piety being considered nothing when compared with intellect – of the whole system having an irreligious tendency.” (p. 6). In reply, Dawes pointed out that the Government had supplied to the National Society: assistance with more schools, better secular and religious teaching methods, cheap books, better educational apparatus and benefit of skilled inspections, teacher training and extra money for teacher salaries. Dawes said the Society’s schools could continue to receive those benefits even if they wished to stop receiving government money for new schools. Dawes’s final thrust would not have regained his favour with Church authorities. He said, in effect, the clergy had been in control of education of the poor for four hundred years and made a mess of it!

Has the example of the last four hundred years, during which time the education of the country, and more particularly of the labouring classes, has been in the hands of the clergy, done nothing to open their eyes in this respect? [...] Is the result such as to make it satisfactory to leave it entirely in their hands for the future? (Dawes, 1850, p. 10)

9.13 The need for science teachers in elementary schools

The problem of the time was that teachers lacked the science training necessary to implement a science-based curriculum such as Dawes’s “teaching of common things”, but change came, though temporarily. According to Layton (1972, p. 54), early in 1853 Inspector Moseley “was charged by the President of the Government Council to draw up a scheme of examination common to all male students in training schools and to teachers seeking certification”. Moseley included science as a subject in each year of teachers’ two years’ training and allowed interested teachers the option to specialise in teaching science. In 1855, Moseley was replaced by Frederick Temple, later to become Archbishop of Canterbury. In 1856 Temple placed Dawes’ *Suggestions* as one of ten books which should be studied by “candidates for lectureships in Church of England training colleges.” (Layton. 1972, p. 45) However, in 1857, Temple severely reduced the amount of science required for teachers in

training colleges. Then, in Layton's words, "new [Government] regulations of August 1861 created a situation in which science languished and finally disappeared from the elementary school curriculum." (Layton, 1972, p. 54) In 1862, following a Government Commission, the Council's budget for school buildings, equipment and teachers' training colleges was reduced. It was decreed, reported M. Sanderson (1995, p. 14) that future payments to schools "were to depend on results of annual examinations conducted by Her Majesty's Inspectors".

9.14 Interpretations of Dawes's educational activities at King's Somborne

At the start of his thinking about establishing an elementary school in King's Somborne Dawes was aware his curriculum would greatly differ from that in the majority of National Schools; it would be much wider and more of a challenge to students. He argued that the better the secular education, the more a child could be given an understanding of religion.

[...] there can be no doubt; but by raising the standard of secular requirements, we should, at the same time, by proper attention, promote the blessing of a sound Scriptural education, in a much higher degree than on any system which aims at so small an amount of knowledge as that which is to be acquired in the great majority of our National Schools. (Dawes, 1847a, p. 3)

These would have been 'fighting words' for those of his fellows conducting other National Schools because, as Dawes's King's Somborne successor, Rev. Charles Nicholls, pointed out (Section 11 above) many thought Dawes' curriculum lacked religion. And Nicholls' himself appeared not to see the social purpose of Dawes's intricate teaching, describing it as supplying "general useful knowledge". Cyril A. Piggott, an active member of the church of which Dawes had once been the Vicar, in 1992 published a memorial of Dawes's work on the occasion of the 150th anniversary of Dawes's opening the parish school. Piggott saw Dawes's attainments through a nineteenth-century lens, namely, that Dawes education activities represented a moral campaign to regenerate students and their families from fallen grace.

Dawes came to believe that the promotion of education in the parish could do a great deal towards improving social conditions and contribute to its moral regeneration. (Piggott, p. 8)

Piggott's statement was similar to that of David Layton's in 1973:

Paramount among the educational objectives which Dawes set for his schools was, of course, the improved moral and religious condition of the pupils. (Layton 1973, p. 39)

Neither took note of Dawes's political and economic motivations which Dawes made clear in the first few pages of his *Hints*.

Dawes certainly did not indicate he thought the school children were morally degenerate. He accepted them as they were. He directed no sermons at them but encouraged them to buy combs and toothbrushes, attend to their hygiene and through school accomplishments such as reading poetry meaningfully and sharing socially motivated homework with their families increased their appreciation of self-worth. Piggott was probably referring to Dawes's comments on the operation in the parish of "the old Poor Law" (Piggott, p. 8). The situation was that the farmers supplied no work, no wages, in winter and the farm workers were supported by the parish which provided work such as repairing roads and paid men according to their number of children. This "old Poor Law" dated back to Elizabeth I and could be seen as reasonable social legislation. Dawes, however, condemned workers who readily accepted the scheme. Their attitude he thought was:

Why spare the parish? [A practice] encouraged by the strangely mistaken principles on which the farmers act, [which] not only has a tendency in every possible way to lower their condition by interfering with the price of labour, and thus lowering their standard of social comforts, but that it totally destroys every feeling of self-respect and of manly independence [...] (Whilst acknowledging the cause), Dawes condemned the man who needlessly (Dawes's italics) throws himself for support on the industry of others, lowers himself in the scale of human beings [...] (Dawes, 1847a, p. 10)

Dawes condemnation of the King's Somborne labourers' attitudes thus depended on assuming that they acted *needlessly*, which was not necessarily the case. We do not know, for instance, if labourers living in cottages supplied by farmers were required to pay rent when out of work. Dawes writes, "I do not throw the blame on them, as regards the past, far from it." And Dawes discussed the idea of a living wage: "that the wages of the industrious labourer, in a healthy state of society, ought to be equal to all the decent wants and respectabilities of his station in life" (Dawes 1847a, p. 11). Which though not required by law would, he hoped, be applied as morally correct by his students, should they become employers (p. 12). An opinion, similar to that to be expressed seven years later by Dr. W.B. Hodgson at the 1854 Royal Institution Lectures on Science and Education, namely, that capitalism which is not controlled by people with moral principles, will not benefit society. (Chapter 4.3) It was not so much that Dawes was concerned with "regeneration" but *generation* of an educated community, members of which would better understand their self-worth and how to defend it. [A poor man with education is less likely] "to mortgage the labour of his future life without an adequate return" (Dawes 1847a, p. 9). [He would]

through education gain a chance of social mobility and gain from religion by thought, not by rote learning of a catechism. Dawes was an educational *and* a political radical.

9.15 Dawes's contribution to education

Dawes showed that much of his vision could be achieved; that with government, church and private donations he could elevate a parish school associated with the National Schools Association that would otherwise teach little but reading writing and arithmetic to a superior standard school providing grammar, history, geography, mensuration and some science; all taught as far as possible in a practical manner.

Dawes' *Suggestive Hints* (1847b) was a social science source book to help teachers select and teach subjects in a practical manner. Half or more of *Suggestive Hints* related to physical science. One section dealt with human and animal nutrition and another with understanding the human condition by using social statistics. The book gained wide recognition, running into its sixth edition in as many years. It was widely distributed to students in training colleges and recommended to teachers by the Committee of Council's inspectors.

Dawes was a kindly man who inspired his young teachers, so enthused his students that they wanted to come to his school and inspired their parents to support their continuing for more years than was common at the time. He considered that the then current drive to provide education for the poor (through the monitorial systems, supported by Government subsidies) was enhancing class division because such schools tended to be exclusively used by the poor. Therefore:

[...] aim at a system of good practical and industrial education, bearing upon the wants of both, for, up to a certain point, the wants both of the labouring class and the immediate employer of labour are the same. (Dawes 1847a, p. 6)

Dawes visualised two important outcomes if the school continued successfully to attract employers and labourers: First, the two classes would better appreciate the needs and wants of the other.

No doubt many jarring elements between these two classes would give way, and the feelings between them be much softened and subdued by an united education which is sound and practically good.[...] [They would enjoy] a pleasure in the recognition of each other's joys, and reciprocal condolences in those sorrows which fall to the lot of every rank. (Dawes 1847a, p.8)

The second important outcome would follow from a labourer paying something towards the cost of his children's' education: he would be more likely to accept and

apply the ways education would suggest out of his poverty. He would be “Less likely to mortgage the labour of his future life without [ensuring] he would gain an adequate return” (p. 9).

Dawes’s vision to reduce class division through a single, high quality, education system, improve the social condition of students’ families, retain teachers in schools with a superannuation scheme, provide a living wage to all backed up by social security such as health insurance, could be said anachronistically qualified him for membership of the British Fabian Society – fifty years before it was formed!

If Dawes had continued at King’s Somborne and increased his school’s success, could he have influenced the government to introduce a comprehensive, modern system of education for the poor and not-so-poor of England? It seemed unlikely! The political situation for the government relative to the church had not improved; the government did not feel sufficiently powerful to follow Kay-Shuttleworth’s urging for a permanent Board of Education and Government support for science in elementary schools vanished by 1861. Many fellow Anglican clergy were not convinced that Dawes placed sufficient emphasis on religion.

Dawes’s ideas of what and how education should be conducted were as radical as his practice of religious education. He thought a school should overcome class distinctions and science could be the instrument to attract middle-class students, presently attending the fee-charging ‘venture schools’, to be educated alongside the children of working-class families. His modestly titled 1847 publications, *Hints* (1847a) described the teaching methods and rapid increase in numbers of children at his school and *Suggestions* (1847b) provided a text book in science teaching for elementary schools, the content of which extended to such things as the value of labour in production and social applications of science.

9.16 Dawes’s legacy

Dawes, as Dean of Hereford, continued to work for science in elementary schools. In 1852 he was elected to the Council of the Society of Arts. In 1853, the Council met with “representatives of mechanics institutes and science societies” and discussed “the subject of “cheaper scientific apparatus for teaching purposes.” Dawes moved, and was unanimously supported, a motion to the effect that “the people desired science and art (technology) to be taught in elementary schools.” A supporting

motion was passed urging that science training should be increased in teachers' training colleges. In 1854 an Educational Exhibition was held in London for which Dawes and Moseley were among the organisers and Dawes (and Thomas Huxley) were among the speakers. Manufacturers exhibited science teaching materials, designs for laboratories, laboratory equipment and books about science. There were "over seventy lectures by leading scientists and educators" (Layton 1972, pp. 47-48). Moseley who in 1853 was in charge of examinations for teachers in training schools had introduced various courses of training in science, one of which allowed specialisation. Following the 1854 Education Exhibition, the Government through its Privy Council committee, provided small grants to schools for science teaching equipment. They reached a total of over £750 in 1856 and then jumped to £2,345 in 1857 and interest in teaching science was high, even among the National Schools. In 1855, Frederick Temple took over Moseley's curriculum position and by 1857 had dismantled Moseley's arrangements for training science teachers. Grants for science teaching aids fell sharply and were stopped in August 1861. This, in Layton's words, was "a situation in which science languished and finally disappeared from the elementary school curriculum" (Layton, 1972, p. 54).

If Dawes had continued at King's Somborne and increased his school's success, could he have influenced the government to introduce a comprehensive, modern system of education for the poor and not-so-poor of England? It seemed unlikely! The political situation for the government relative to the church had not improved; the government did not feel sufficiently powerful to follow Kay-Shuttleworth's urging for a permanent Board of Education and Government support for science in elementary schools vanished by 1861. Many fellow Anglican clergy were not convinced that Dawes placed sufficient emphasis on religion.

9.17 Notes to Chapter 9

Note 1: Richard and Mary Dawes came to King's Somborne in 1837. In the previous year, Frederic Hill published *National Education; its present state and prospects* ('National' referring to Britain's education not to the Church of England's 'National Schools' system). Hill estimated (pp. 65-6) 172,000 children were in National Schools, the latter number, he wrote, being "far short of the number stated by its reports." Implicitly, Hill's estimate cast doubts on the figures used by the Government to distribute 80 per cent of subsidies to the National Schools. (Chapter 4.1)

Note 2: That bothersome inclusion in his school numbers of the 34 infants acquired when Dawes took over a Dame-school in 1847 continued to be overlooked by Dawes. In his 1853 paper to the Society of Arts (p. 6) he referred to a “gradual increase” but his figures which showed the numbers increasing sharply from 158 in 184 to 219 in appeared to contradict his statement. However, for comparison with previous figures he should have omitted the number of his newly acquired 34 infants.

Note 3: Dawes’s successor at King’s Somborne, Rev. Charles Nicoll, admitted he approached his task with some prejudice against Dawes’s methods, but they continued to be successful under his application and, further, visitors who might have doubted that Dawes supplied religious teaching “will testify that it is possible to combine a high degree of general useful knowledge with the principle of a sound religious education.” (1853, p. 9) Dawes indicated no reaction to being damned with faint praise for all his admirable and advanced teaching. In the same lecture, Dawes detailed thirteen schools or groups of schools where his procedure had been successfully applied in widening the curriculum and differentially raising student fees, especially when teachers from King’s Somborne had been employed. (pp. 9-24) Inspector J.P. Norris in 1853 supplied Dawes with extracts from his 1851 Report to the Committee for Education. In his industrial district of Walsall (near Birmingham and Wolverhampton) Norris reported that about twenty rural schools had “adopted the King’s Somborne plan” and “about forty town schools have raised the fee in the first (top) class.” (Dawes, 1853 p. 25)

Note 4: Dawes was well-known and well-regarded in his own time. In Chapter 4. Charles Daubeny, Oxford professor of Chemistry, Botany and Rural Economy in his 1854 lecture at the Royal Institution referred to the “Dean of Hereford [Richard Dawes] whose teaching and success in organising schemes of secular instruction [with regard to science in elementary schools] are now fully recognised.” Selleck (p. 234) referred to “the battle between the National Society and the Committee of Council” where the Committee and (its secretary) Kay-Shuttleworth had [their] defenders. They included the influential Richard Dawes whose parish school at King’s Somborne had drawn the Committee’s praise.”

9.18 Summary Chapter 9

- Rev. Richard Dawes (1793-1867) academic, college business manager and Church of England priest developed a curriculum in a nineteenth century English village school with which he sought to modify differences in social class.
- Dawes emphasised tolerance and secular teaching within a school system devoted to instilling Church of England doctrine.
- He based classroom teaching on things familiar to children and integrated subject content.

- On the basis of good English and proficiency in arithmetic he taught science to his students to encourage parents of “that class immediately above that of labourers” to send their children to his school.
- For his system to be widely adopted he needed science teachers trained in his practical teaching methods.
- Initial government support for science in elementary schools was eroded by Church of England opposition to state intervention in education.
- He achieved outstanding results in student engagement and educational attainment in his school but failed to get his system widely adopted.
- From 1837 to his death in 1867 Richard Dawes was engaged with the quality of education, science in elementary schools, reducing social differences through common schools, teacher training in science, and the place of religious teaching in government schools; all topical issues in Australia.

Chapter 10

QUEENWOOD COLLEGE: THE EDMONDSON YEARS 1847-1863

Queenwood itself is a beautiful spot, it stands in a rich undulated chalk district, the small knowls and vallies are always graceful and smooth and the rich woods, with their beautiful beeches, yews and elms have a soothing effect (Hirst, 1850). (see Note 1)

10.1 Queenwood College location

On a hill above the Hampshire village of Broughton is a wide wind-break, edging cultivated red soil farmland, strewn with small lumps of chalk. From the 1847 inauguration of Queenwood its staff enjoyed the beauty and placidity of the school surroundings, especially to walk, talk and smoke a cigar after tea. (Edmondson did not allow smoking or alcohol in the school buildings.) John Tyndall, on one of these occasions recorded: “A heavenly night – the moon shone sweetly through the avenue trees lighting up the vistas which mimicked Gothic windows washed with silvery radiance.” (Tyndall, Journal, August 27, 1847) Edward Royle (Royle, 1998, p. 82) reproduced a contemporary sketch of another of the grand avenues near the school: of yew trees, their branches interlocking to form a great tunnel (see Note 2).

Many of the fine trees remain but of the College burnt to the ground in 1902 there is little sign. The searcher might find bits of walls, rusty wire, remains of a shed and the overgrown Gatekeeper’s cottage (see Fig, 10.1). There is no sign to inform the passer-by of *Harmony Hall*, the building once so important to Robert Owen and an agricultural group which sought a perfect community life, a taste of the New Society they hoped would transform England’s economy. Under George Edmondson, the building emphasised the importance of science to modern life and provided scope for its young teachers to become famous scientists and mathematicians or headmasters of their own schools.



*Figure 10.1 Overgrown Gatekeeper’s cottage at Queenwood College
(Courtesy Somborne Society)*

The College building (Insert Fig. 10.2) was an extraordinary building to find on Hampshire farmland in 1847, or at any other date! It was built in 1841-3 under the direction of Robert Owen, then governor of the co-operative *Queenwood Farm Community*. Its architect was Joseph Hansom, designer of the “Hansom Cab”. David Thompson (1955, p. 246) stated the cost of the building and its furnishings was £15,000.

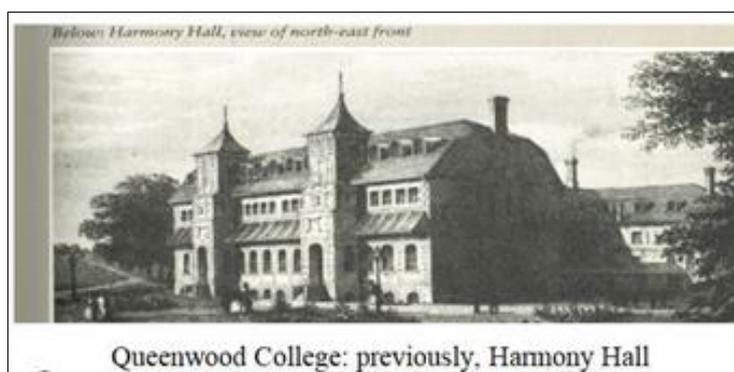


Figure 10.2 Queenwood College: previously, Harmony Hall

Tyndall’s successor as mathematics and physics teacher was Thomas Archer Hirst. In 1850, Hirst wrote:

The building itself is interesting [...] its architecture is in a novel and picturesque style [...] its inward arrangements [...] are the most convenient and beautiful I have seen [...] it now makes one of the most beautiful schools I ever saw. (Hirst Journal, 1850)

10.2 Initial staff

Students who arrived in the first term were served by Principal George Edmondson, aged 48, Anne Edmondson (née Singleton and designated “Ann” in Census returns), 49. There is no mention in Tyndall’s journal of Mrs Edmondson teaching but she was in charge of the domestic staff and shared school decisions with her husband. With her daughter, Jane, and John Tyndall she was a member of the school editorial committee. Jane Edmondson, 23, the Edmondsons’ daughter, gave lessons in phonography (shorthand) to teaching staff after the evening lectures to students. She occasionally assisted Tyndall in the school office and took a few lessons in chemistry from Frankland.

Josiah Singleton, Anne Edmondson’s brother, age not identified, taught drawing and English and acted as senior master. Tyndall and Frankland referred to him as ‘father’.

John Tyndall, 25, in the first term acted as school secretary, taught surveying and gave six evening lectures on physiology and six on steam engines. Sometimes, Frankland in his journal refers to Tyndall as “Wat” or “Wat Tyler.”

Edward Frankland, 22, taught agricultural, physical and analytical chemistry, botany and geology. In his first lecture on the origins of chemistry he referred to the alchemist, Hermes Trismegistus. After that, Tyndall in his journal referred to Frankland as “Hermes” or “Tris.”

Mr Davidson, age and initial not identified, taught mathematics.

John Yeats, 24, taught history and geography. He had taught at one of Fellenberg’s schools in Hofwyl, Switzerland.

Richard Davis, 27, had been the farm superintendent of the Queenwood community. He continued in that capacity with Edmondson, and was one of Edmondson’s four business partners.

To attend to the food and accommodation side of the boarding school, the 1851 Population Census listed ten resident domestic staff: housekeeper, cook, under-cook, scullery maid, three housemaids, two sempstresses and a house servant. In addition, it may be presumed local daily staff would have been required to attend to the eight-acre kitchen garden and the school grounds.

10.3 Edmondson: schooling and Russia experience

George Edmondson (1798-1863), was a son of poor Quaker parents who lived in Lancaster, Lancashire. Holyoake (2004) described their occupation as “trunk manufacturers” (p. 1). Jane Benson (née Edmondson) (Benson, 1879) described her father as “a ship chandler in a small way” (p. 14); possibly the “trunks” included sailors’ sea-chests? Later, his parents changed their business to “Grocer – and licensed Tea-dealer” (p. 63)

Edmondson was first educated in the local Quaker school in Lancaster and, when 12, for two years during 1811-13 at Ackworth, the Quaker boarding College in Yorkshire for children of “less affluent” Quaker families. His experience at Ackworth was Spartan-like under a well-intentioned management. Contrary to an article by David Thompson, an early writer about Edmondson:

Here (at Ackworth) he received the full impact of a Quaker tradition which, seeking to include manual pursuits within a system of education, was not unlike that of Pestalozzi and Fellenberg. (Thompson, 1955, p. 247)

The writer was not correct. Edmondson and fellow pupils received no manual training during those two years at Ackworth. It seemed that Thompson accepted a statement of *intent* made by Dr. John Fothergill, Ackworth founder, as one of *accomplishment*. Jane Benson on p. 40 of her 1879 “*From the Lune to the Neva*” (second binding), wrote:

Dr. Fothergill proposed that the pupils on both sides of the house [i.e. boys and girls] should be taught a trade. It was one of his favourite ideas. [...] But it was never carried into practice.

The author of *The History of Ackworth School* (Anonymous, 1853) explained:

It is worthy of observation, that almost all the public schools of Friends in this country, started with idea of combining labour with intellectual instruction, both with the view to profit, and to physical and mental health; but with a uniformity which is striking, not one of twenty years standing has continued to carry out the plan, beyond the employment of the children in the garden, and in those domestic offices by which they may be taught to wait upon themselves, and to save a multiplicity of servants. (p. 34)

In 1815, Edmondson was an apprentice to a Quaker schoolmaster of a private boarding school near Sheffield. His apprenticeship was interrupted, probably in 1817, so that he could receive training in agriculture from Daniel Wheeler and in 1819 join Wheeler’s party of Quakers to direct a large agricultural project in Russia, details of which appear in Benson’s book (Benson, 1879, pp. 88-115). In summers, Edmondson directed one important part of the drainage and soil rehabilitation project; in winters he tutored Wheeler’s younger children.

10.4 Edmondson’s schools in Lancashire

Edmondson returned from Russia at the end of 1824 with his Nottinghamshire wife, Ann, and their baby daughter, Jane. He started his own school in Blackburn, Lancashire. According to Thompson (1956, p. 26) on 5 April, 1825 with one student in a room adjoining the Ball and Concert room, Market-street Lane, Blackburn. Students came and by 30 August he moved to a larger room at 3 Union-street. In 1827, he moved to larger space at Lower Bank, Dukes Brow, Blackburn where, Thompson (1956, p. 26) wrote: “He was able to put into practice some of his enlightened views on education.” Where had he gained these “enlightened views?” Was Thompson still assuming he had gained them from his time at Ackworth? Or, in the two years since his return from Russia had he gained them from the Friends Educational Society to which Thompson refers? Was it necessary for Edmondson to

have had a direct cause of his beliefs about education? He had served three years or so with a Quaker headmaster. As a Quaker, he could have been aware of the advanced views about education enunciated by Quakers in the 17th century: that both boys and girls should be educated; that the education should comprehensively embrace all sciences, history, geography, mathematics and law; that it should be useful and be applied to serve mankind. Whether or not he was aware of these high aims, Edmondson's school *actions* from 1825 to his death in 1863 were in accord with the early Quaker principles, other than teaching boys *and* girls.

Edmondson, according to Thompson, (1956, p. 26), equipped his school at Lower-Bank, Blackburn for the use of pupils "a printing press, a lithographic press, a turning lathe, a workshop containing tools and a carpenter's bench." Edmondson wrote, printed and bound: *A concise introduction to Geography* (1837), *A Course of Practical Geometry* (1837) and *Problems in Practical Perspective designed for the use of pupils of Lower Bank Academy* (1841).



Figure 10.3 Tulketh Hall, Preston, Lancashire Quaker George Edmondson's boarding school, 1841-1847.

Thompson (1956, p.26) further reported that Edmondson's school at Lower Bank was so successful that he had to find larger premises. In 1841 he moved about nine miles to Preston, a port city, also in Lancashire, where he established a boarding school in Tulketh Hall. Here, at fees of £40 per student, per annum, Edmondson's "reputation attracted pupils from all over the country." (Russell, 1986, p. 152) remarked that Edmondson introduced chemistry at his Blackburn and Preston schools "to put into practice his conviction that science was an essential part of education which should prepare for the practicalities of trade". Thompson records

Edmondson's report to the 1841 meeting of the Friends Education Society about parts of his high standard Tulketh curriculum:

Land surveying, Levelling, etc., are taught by us in the field as well as in the school room; the art of using the requisite instruments is as important as the theory. In Book-keeping our text-book is *Jones's English System*. We devote ten hours per week to this branch, including Mental Arithmetic.

In mathematics: Fractions have our particular attention [...] we have always a class studying Mensuration, Algebra, and other branches. Many have gone through Logarithms, and a course of Plane and Spherical Trigonometry. One boy has just left us who enjoyed the more difficult questions in Cubic Equations, and was beginning to relish the indeterminate and Diophantine Analysis. (Edmondson as cited by Thompson, 1956, p. 27)

During 1844-47 Edmondson increased science in the Tulketh Hall curriculum. Russell, drawing on the monthly school news sheet, *Tulketh Hall Mercury*, prepared and printed by the boys, reported that in September 1844 Edmondson lectured on chemistry and some of the boys were getting "retorts and other requisite apparatus to pursue this delightful subject further by themselves" In 1845, "a whole series of chemistry lectures was given by a Dr. Robinson and one of the boys, W. F. A. Shearson". In 1846 Edmondson again lectured on chemistry; "clearly unafraid of imposing chemical theory on their juvenile intelligence" (Russell, 1986, pp.152-153).

10.5 Lancashire citizen

By the end of 1846, George Edmondson was widely known in the North Country for his twenty-two years as a headmaster and, as illustrated by the following press notices, for his considerable status in the Lancashire community. In 1838 he was named a member of the Blackburn Grand Jury. (*Preston Chronicle*, January 6, 1838) He became chairman of an "Anti-war Association" which was "determined to use every Christian means for the prevention of war and the promotion of peace all over the world." (*Preston Chronicle*, March 28, 1843) He was one of 25 provisional committee members seeking £2000 in £5 shares to build the Preston Public Baths which would be "sufficiently large to accommodate as well the lower classes at a moderate fixed price, as the more wealthy upon a higher scale" (*Preston Guardian*, September 13, 1845).

About July or August, 1846, Edward Frankland, aged 20, and fast developing as an analytical chemist, visited his family home in Lancaster, presumably for a summer break from his duties as Lyon Playfair's lecture assistant at Putney Engineering College, London. Edmondson travelled the 25 miles from Preston to ask Frankland

to come to Tulketh Hall for a few days to give him “some lessons in analytical chemistry”. Frankland did so and found Edmondson “a ready pupil” (Russell, 1986. p.153). In this same vacation, Frankland was invited to lecture at the Lancaster Mechanics’ Institute. “To Frankland, who had never lectured in his life before, and who had a dread of public speaking, it must have been a severe ordeal. But he did not refuse”, writes Russell. The first of the four lectures delivered before Frankland returned to London to complete the second year of his £50 a year contract with Playfair was on “Chemical Analysis” at which the sixteen who attended voted to form a class for the study of chemical analysis. The second was on the early history of chemistry; the third on the geology of the earth and the fourth, on September 4, was on “agricultural chemistry and vegetable physiology” (Russell, 1986, pp. 154-156). Fortune favoured Frankland, as by April 1847, Edmondson who was recruiting staff for his new school in Hampshire, invited Frankland to join as Chemistry master. Edmondson’s support of science teaching at Tulketh Hall was not unique nor was the laboratory teaching at Queenwood but, during Edmondson’s sixteen years as principal of Queenwood it became a very good boarding school with emphasis on a practical approach in science and mathematics.

10.6 Queenwood opportunity

On April 1, 1847, Edmondson completed a deal with the Trustees of the Queenwood Farm Community by which he and his Owenite business partners acquired the contents and lease of Harmony Hall, and the lease of an adjacent 800-acre farm, for £5,000 (Royle, 1998, p.236). Edmondson gave short notice to parents and boys of his departure from Tulketh Hall and advertised widely the opening of his new school in August, 1847. His first advertisement appeared on May 1 in the *Hampshire Advertiser & Salisbury Guardian*, the *Bristol Mercury* and the *Preston Guardian*. It emphasised that George Edmondson was moving from Tulketh Hall to Queenwood College in Hampshire which would have a large farm and would offer extensive courses in agricultural science; a laboratory for the practical teaching of chemistry, advanced apparatus for teaching physics and practical training in surveying and civil engineering. In addition, it would provide mathematics, classical subjects and languages. The advertisement was repeated during May in the *Manchester Times and Gazette*, the *Hampshire Telegraph and Sussex Chronicle*, the *Hampshire*

Advertiser & Salisbury Guardian and the *Bristol Mercury*. Altogether, the advertisement covered his previous Lancashire constituency, the port and city of Bristol and the southern triangle of Salisbury, Winchester and Southampton of which the new school was situated in the centre. The new school was the Harmony Hall, Hampshire built by Robert Owen in 1841-3 for an Owenite Farm Community. In 1847 Edmondson renamed it, *Queenwood College*

After the school opened, Edmondson repeated the advertisement during September, October, November and December in Yorkshire, Hampshire and Belfast newspapers. Later, he extended his advertising to include London newspapers. The 1851 population census provided details of the boys' birthplaces which indicated Edmondson was keeping many from his schools in the north and attracting students from the south.

10.7 Move to Queenwood College

Edmondson gained control of the bankrupt Harmony Hall on very agreeable terms as the Owenite community leaders thought Edmondson's school would be in line with the type of school they had planned for their own community. By the deal which Edmondson completed on April 1 1847, he and four business partners acquired the contents and lease of Harmony Hall and the lease of an adjacent 800-acre farm. Edmondson's four partners were John and Edward, sons of John Finch, William Pare and Richard Davis, the farm superintendent. John Finch and Pare had been closely associated with the Community in governor roles and Davis had been recently appointed farm superintendent by the Owenites. According to Royle (1998, p. 236) these four partners showed their faith in Edmondson's ability to conduct a profitable and socially worthwhile enterprise, but it seemed they had no more assessed its likelihood of success than they and their associates had been able to prevent Owen contributing to the failure of the agricultural community by committing funds that did not exist. In this case, the four Owenites and Edmondson each contributed £1,000 capital without appreciating it was insufficient and they would have to use revenue to meet immediate capital expenditure. They paid £4,000 for the Hall contents and farm goods, £3,000 for renovations which included fitting out a laboratory in the basement, installing a gas works, and had land rent to pay. Thus, on capital, the partners were minus £2,000 before the school opened: a sum about equal to advance

fees from eighty students (but they barely obtained sixty by the end of the first year). There were other immediate costs to pay such as advertising the school, advertising for staff, transport of goods and equipment from Tulketh Hall. Initial requirements also included the surveying equipment Tyndall required for his classes and laboratory materials needed by Frankland. From April 1, four months before opening the school, they had to pay wages for farm maintenance less any returns from farm produce sales, maintenance of the school property and the eight-acre kitchen garden, and so on. When the school opened in August there were food and accommodation costs for twenty 'non-paying' residents: three Edmondsons, seven teachers and ten domestic staff. The five investors had clearly substituted hope and faith for a realistic budget.

For his £1,000 Edmondson gained Harmony Hall which Owen had designed to contain three schools with student accommodation, other accommodation for nearly a hundred persons and a farm with which he could introduce agricultural science. He could dissociate himself from Robert Owen, whom he did not like, and Owen's supporters, by renaming Owen's *Harmony Hall* as *Queenwood College*. He could start his new school uninhibited by any previous practices or parental attitudes. But Edmondson took the risk that his reputation so strong in Lancashire had spread widely enough to attract students from London and southern counties and that parents of his current boarders would readily transfer their sons to his new school. There is no evidence that he considered his disadvantage in moving two hundred and forty miles south of Preston; that with his Quaker style of speech and manners and his North Country accent, he might seem a foreigner to the people in his new school district of Hampshire.

10.8 Edmondson's teaching plans

One leading object at Queenwood [...] our pupils' progress will be tested by their ability, and not by their amount of knowledge. So far as possible, everything will be taught and learned among us, practically, that is with a view to the business of life. (Editorial in the school paper, *The Queenwood Reporter*, February 15, 1848)

Headmaster George Edmondson's aim was to provide a modern and scientific education with practical application for student employment and to encourage the boys' understanding of the issues of their time through a staff-student mutual improvement society. Edmondson's skill in selecting the emerging genius, Edward

Frankland and his own reputation which attracted John Tyndall to apply for a staff position, allowed him, in the school's inaugural year, to emphasise the range of science and technical subjects his school would provide: surveying, physiology, botany, physics, chemistry, agricultural chemistry and the important technology of the day - steam power and its applications in industry and railways, were all in the school's initial curriculum. The daily journals of Tyndall and Frankland, supplemented by Tyndall's letters, bring the school to life in their descriptions of members of staff, daily life in this boarding school, tea-time staff discussions; student excursions and walks in the countryside; school sport and excursions and use of the gymnastic equipment. Together, with copies of the first three issues of the school's *Queenwood Reporter* relating to the first and second years and copies for the calendar year of the student newspaper, *The Queenwood Observer* and to contemporary newspapers we have a fairly comprehensive picture of Queenwood College, its aims, achievements and problems during Edmondson's sixteen years in control before his untimely death in 1855.

10.9. Misrepresentation of Queenwood College

Over the years, Queenwood College has attracted the attention of historians of school science but some wrote history backwards. They transferred the aura and scientific achievements of distinguished scientists to the College where in their early days they had their first experience of school teaching, apt or inept. For example, David Layton (1973, p. 51) wrote:

It should be remarked that the staff of Queenwood around the mid-nineteenth century, must have been one of the most distinguished in the history of school science teaching. (Layton, 1973, p. 51)

Not one of the five mentioned by Layton – Frankland, Tyndall, Debus, Galloway, Hirst - was “distinguished” in England when he first taught at Queenwood, nor were more than two on staff at the same time. Although Frankland aged 22, was gathering a reputation as Lyon Playfair's lecture assistant at Putney Engineering College, London. Tyndall, who was working for a railway engineering consultant, had no teaching experience but fearing the collapse of the railway boom, recruited himself. It was Tyndall, not Edmondson, who recruited Hirst and Galloway, both young men with no teaching experience. Debus, an assistant to Bunsen at Marburg University, was recruited by Tyndall and Frankland during their time achieving their PhDs in

Germany. Frankland, a Lancashire man, would have been known to some who encouraged him in his school days but the other young men would not have been “distinguished” when they joined the College staff. But, between them these men and the teachers on the humanities side gave rise to an interesting and pioneering school and flourished in the atmosphere of Queenwood, moving on to high academic positions or to starting their own schools. .

Frankland applied innovative procedures in teaching chemistry and Tyndall rapidly gained good rapport with his “lads” in his surveying classes. Brock (1996, p. 1) writes “the essence of teaching at Queenwood College was its emphasis upon the practical, as well as the theoretical, aspects of each subject”. Whether in the first year, English or other languages were taught in a practical manner is not clear. Edmondson in his inaugural advertisement did not claim they would be but in the *Hampshire Advertiser* for 15 and 22 July, 1848 for the start of the 1848-49 schoolyear, Edmondson referred to “French and German are continuously spoken in the Establishment by natives”. Did this suggest Queenwood’s language classes were taught by direct methods?

10.10 Edmondson’s principles

Necessarily, a teacher carries into his own practice elements of his student experience to apply, or possibly to deny. It has been noted that Edmondson’s experiences included elementary education in a village Quaker school and two stark years at the Ackworth boarding school for children of “less affluent” Quakers. As an apprentice teacher, he learnt bookbinding and, one assumes, elements of teaching. In a period of transferred apprenticeship to Daniel Wheeler, he received instruction in agriculture preparatory to becoming a member of Wheeler’s Quaker agriculture team that worked on an Imperial drainage and soil rehabilitation project in Russia. As a young teacher in Lancashire, he associated with the Friends’ Education Society to which he reported his school developments in installing workshop equipment for the manual training of his schoolboys and he encouraged his students to conduct self-development activities. According to G. J. Holyoake (1817-1906), an Edmondson contemporary, Edmondson “was one of the original promoters of the College of Preceptors” (Curthoys, 2004, p. 1). Enquiry to what is now the College of Teachers could neither confirm nor deny Holyoake’s assertion.

Edmondson was a Sabbatarian which led to dull Sundays for the boys who after attending chapel in the nearby village of Broughton on a Sunday morning - and a cold dinner to follow - had then to stay on the school grounds for the rest of the day. Edmondson did not even like his staff exercising on a Sunday. Frankland records in his Journal for 16 January, 1848 that returning from a Sunday walk he was met by Edmondson who asked him how his conscience permitted him to take a walk on a Sunday!

The first issue of Queenwood's official paper, *The Queenwood Reporter*, announced as to be published bi-monthly at two pence a copy, appeared on February 15, 1848. Mrs Ann (see Note 5) Edmondson, Miss Jane Edmondson and John Tyndall comprised the editorial committee. On page 8 appeared a letter from Edmondson to his agriculture students, referred to in the school as "the farmers", which indicated his appreciation of independent thought, the social role of science and his vision of the humanitarian purpose of education. Edmondson said his aim in writing the letter was "towards inducing among you a spirit of independent enquiry" but he said much more. He argued that the principles of good agriculture had changed farming from a hard-won subsistence activity to one of liberal productivity enabling the feeding of masses of people; that "In tilling the soil it is, that man appears in his noblest aspect; he ceases to be a destroyer and becomes a producer." The time saved through efficient production leaves more time for the farmer to cultivate his mind and engage in religious exercise.

10.11 Queenwood's three schools

In its first year, Edmondson's Queenwood exercised the functions of three institutions. There were older boys, 17-25, learning agriculture; the regular secondary day school for boys aged 12 years and upwards which was organised in three capability divisions and the equivalent of an evening institute at which hour-long lectures were presented after tea by staff and students. Edward Frankland strode colossus-like across all three. He taught agricultural chemistry to the "farmers" and organised fertiliser plot tests, taught chemistry to students in the top two grades of the day school and delivered upwards of 59 per cent of all evening lectures.

Tyndall taught bookkeeping to the "farmers", surveying to interested students in the day school and delivered up to 22 percent of the evening lectures. In the first term he

also acted as School accountant and in the second term he taught history to day classes - of which he did not list details in his Journal.

The school for agriculture

On September 30, 1848 and again on January 13, 1849 Edmondson and Queenwood College were featured in *The Illustrated London News* in a series of articles about agricultural colleges. The January 13 article was reprinted with acknowledgement to *The Illustrated London News* in the *Manchester Times* for February 10, 1849 and in the *Preston Guardian* for May 19 so giving considerable publicity to Queenwood and Edmondson. In part, the writer of the January 13 article indicated that Edmondson had modelled Queenwood “to a great extent” on de Fellenberg’s establishment at Hofwyl, Switzerland and shared a basic educational principle with de Fellenberg, namely,

the first business of an educator is to develop the various faculties of the youthful mind fully and harmoniously, and the next is to give those faculties a proper training, with strict reference to the future destination in life of a pupil. (Manchester Times, 10 February, 1849)

This was too general and too similar to the Quaker idea that schooling should contribute to students’ employment prospects to allow one to suggest that Edmondson had a detailed knowledge of Fellenberg’s education principles or of the complex organisation at Hofwyl at a time when Fellenberg was at the height of his career. Edmondson might have derived his thought from the following lines which appeared in the *Quarterly Journal of Education*, July, 1833 (p. 340):

M. de Fellenberg considers *education* as the total of the means for effecting a development of the faculties of the pupil, and the giving them a direction in conformity with his high destination as a human being [...]

In the same article the author, who was the editor of the *Quarterly Journal*, described the farm work and schooling provided to poor children from Bern and the workshops in which the children learnt farm trades. It is clear from the details of the nine Hofwyl establishments which are described in the Notes that Queenwood agricultural activity in its first term could not be compared with the then established and sophisticated institutions of Hofwyl (see Note 6).

The main school

That first term was generally happy for all. There was an early excursion and picnic to Stonehenge and in Broughton the post office and grocery store supplied the welcome function of a tuckshop for use on half-holidays. Tyndall became acquainted

with it on August 25, 1847 and with what was to become his routine, “bought some sweets and a bottle of ginger-beer”

Evening lectures

Presented regardless of the boys’ half-holidays on Saturdays and Wednesdays or Thursdays, there was an extraordinary torrent of evening lectures, the majority of which were presented by Frankland. There is no record in the available Queenwood school history of any subsequent science teacher presenting as many evening lectures a year as Frankland. Of the total 140 recorded, Frankland delivered 82 (59%), Tyndall 31(22%) and all others 19%.

1847-48: First term: August-December		1847-1848: Second term, January-June		1848-49:First term, first three months: July- Sept.	
	<u>no.</u>		<u>no.</u>		<u>no.</u>
Frankland	27	Frankland	37	Frankland	18
Tyndall	14	Tyndall	12	Tyndall	5
Yeats	8	Yeats	3		
Edmondson	3	Edmondson	1	Edmondson	-
Davidson	3	Cockayne	1		
Singleton	2				
Fawcett - student	2	Fawcett - student	1	J. Mansergh-	1
R. Mansergh - student	1	Johnson Bailey - student	1	student	
Total	60	Total	56	Total	24

Figure 10.4 Summary of Evening Lectures at Queenwood College during the 15 months Frankland and Tyndall taught at the College (details from Tyndall’s and Frankland’s journals). The total number would have been higher as on some evenings neither was able to attend the lecture

10.12 Frankland’s teaching

Frankland’s journal entries indicate that his teaching methods embraced class laboratory work. The second feature of Frankland’s teaching, perhaps many years

ahead of school chemistry teaching practice, was indirectly touched on by Thompson when drawing on the school boy diary of Henry Fawcett, later to be England's Post Master-General. "Fawcett was extremely interested in science, and records how, on 5th October, 1847, he finished his first preparation in practical chemistry; it was, we are told, lead bichromate or chrome yellow" (Thompson, 1955, p. 251). How, within two months of Frankland's arrival at Queenwood, could one of his students, Henry Fawcett, with no previous experience of science or signs of scholarship (Holt, 1915, p. 7) proudly produce a chemical preparation? It could have been the result of a class exercise or that Fawcett was working his way through a number of graded exercises prepared by Frankland for individual student work. Tyndall described the existence of such exercises when he was learning chemistry from Frankland. For example, on 11 May 1848 Tyndall recorded he "finished the 7th mixture;" on 12 May, "analysed the 8th mixture;" on 17 May, "commenced 9th mixture." A third feature of Frankland's teaching was his 'manipulation classes' at which he taught his boys how to handle laboratory equipment. The fourth feature of his teaching, as described above, was his evening lectures. The fifth and sixth aspects were that he constantly revised his lessons and lectures and every two months set his students examinations which covered both.

10.13. Second term – January-June, 1848

School work started with a rush after the Christmas-New Year holiday. As Figure 4 shows, the boys received eleven evening lectures in the period January 17 to the end of the month of which Frankland gave six and Tyndall, two. Figure 4 also indicates that Frankland on Sunday, January 22, together with other teachers experimented in sniffing chloroform, an event recorded by Tyndall but not by Frankland.

Date	Lecturer	Subjects
Jan 17	Frankland	Chemistry and Botany: Discussed recent examinations
Jan 18	Tyndall	Steam engines
Jan 19	Frankland	Supply of water to towns: Tyndall reports that F. dealt with the hardness of water and estimated the savings to people in cost of soap if the hardness were reduced at the municipal level.
Jan 20	Henry Fawcett (stdnt)	The condition of agricultural labourers. [H.F. used shorthand notes.]
Jan 22	Yeats	Not stated
	Frankland	Jan 22. "Wrote out Syllabuses of my lectures on Chemistry and Botany for publication in <i>The Queenwood Reporter</i> ."
	Tyndall	Jan 23. Sun. "Inhaled chloroform after dinner, extraordinary effects, poor Tris (Frankland) was totally drunk."
Jan 24	Frankland	Irrigation and Drainage.
Jan 25	Tyndall	The expansion principle and the nature of steam, common and superheated
Jan 26	Frankland	Hydrogen peroxide and the preparation of nitrogen
Jan 27	Johnson Bailey (stdnt)	Not stated
Jan 28	Frankland	Present condition of the crust of the globe, the evidences that exist of its high antiquity and the modern date of man
Jan 29	Yeats	The Character of Admiral Earl St. Vincent
Jan 31	Frankland	Diffusion of gases and the constitution of the stratosphere

Figure 10.5 Evening lectures at Queenwood College, January 1848 (as recorded by Tyndall or Frankland)

10.13. Second term: January –June, 1848

Tyndall (1820-1893) was older and more socially experienced than Frankland (1825-1899) and the change from commercial to school life was easier for him than Frankland's from assisting Lyon Playfair's lecturing. Tyndall had enjoyed a regular secondary education and for some years served extremely demanding clients in railway engineering consulting. He taught surveying which was an established technical subject for planning roads, canals, railways and mines; for draining swampy land and preparing building sites. He gave practical examples of the latter when he surveyed a site for new Queenwood classrooms and mapped the school farm. He taught bookkeeping to the agriculture students and we may assume all the boys gave considerable attention to his lectures on steam engines as in the previous four or five years they had seen the railways replace the stage coach for intercity

travel over much of England. At the start of the second term, Tyndall felt his first term Queenwood experience had enlarged his experience and his ability. He had added history to his teaching subjects. He wrote in his journal for 23 March, 1848: "I have rather multiplied myself since I came to Queenwood."

Frankland, too, was widening his activities and he examined local efforts to raise agricultural productivity. On 17 February 1848, Frankland noticed near Romsey, a town between the school and Southampton, "a good deal of good soil lying in an unproductive condition for want of draining." At the time Frankland was experimenting on the school farm with guano as a crop fertilizer. For the morning of Saturday, 4 March Frankland recorded his conversation with "Mr Sharpe, manager of the Southampton Gas Works" who had designed a domestic gas oven but was having the greatest difficulty in selling it though he demonstrated that gas was cheaper than wood and the "cooked meat was better in flavour." Sharpe, Frankland explained, "found an insurmountable obstacle in the ignorance and prejudices of cooks and domestics." Frankland then visited a farm where sheep and cattle were "fed in (covered) pens on a pretty extensive scale, a single row in a long shed was found to answer much better than a double row in a wider one; the animals were fed on chopped clover, turnips and boiled pease, they become well fatted and worth 48 shillings each in 2 to 3 months." [...] "Bullocks are also stall fed here and with good results," he noted.

On Sunday, 12 March, Frankland was called out of bed "to administer chloroform to a cow on the school farm which had just calved and had ejected the uterus along with the foetus." The effort to replace the uterus proved unsuccessful. The cow died by the morning but the calf survived.

Frankland used his Queenwood laboratory for research into what became known as organometallic compounds and together with his friend, Hermann Kolbe, Ph.D., also a former assistant to Lyon Playfair, attended a meeting of the Chemical Society in London on Monday, 7 February, 1848 and read their joint paper. Frankland recorded in his journal for that date that "there was a very large attendance, our paper was warmly applauded, and I was warmly complimented by the President

On 15 March a recently arrived young science teacher, Cockayne, presented the evening lecture, substituting for Frankland who was conducting a post-mortem for

the local Coroner. It was suspected that a man had died from poison and Frankland was examining the contents of his stomach. He found traces of cyanide but they came from impurities in one of his reagents. Frankland purified the reagent and after repeating his tests he was able to report the man had not been poisoned!

Earlier, on Monday 28 February, 1848, Frankland marked the examination papers completed by his students on the previous Saturday and the quality of their answers “pleased me exceedingly” but there were no answers from the farm students who were on strike. The revolt spread to non-farm students. On 6 March Frankland recorded the laboratory class as “behaving very ill. I sent 3 out and suspended 2 others for a fortnight.” On 10 March he suspended Johnson Bailey for a fortnight. Where was Edmondson in all that trouble? Apparently in a very sensitive mood because on Monday 20 March Frankland records: “Cockayne [a new, young science teacher] and Mr. Edmondson had some altercation respecting the Farm Students whereupon Mr. E. discharged him.”

Close to the end of term, the “farmers” and other students were still unhappy. Tyndall noted: “Sundry matters during the day compelled [me] to put harshly down an insurrectionary spirit among the older lads” (Tyndall, Journal, 10 June, 1848).

Just previously, on May 31, matters affecting staff relationships came to a head at a meeting in Mr. Edmondson’s rooms. From Tyndall’s journal of that date, it seems that Edmondson was employing History teacher, John Yeats, to spy for him on members of staff and that he had agreed to pay Yeats a bonus for each new pupil.

Yeats confirms that teacher Morton took a boy out of school on a recent Sunday without permission and bought him beer at the local village pub, after which the boy was sick. Morton is not sacked because Tyndall and Frankland consider Yeats obtained the information unethically by acting as a friend to the boy. Tyndall and Frankland take the opportunity to announce they cannot possibly continue to work under Edmondson and will resign – a hypocritical decision because from at least the beginning of the term they had planned to give notice at the end of term in order to start their PhD studies in October at the beginning of the German University autumn term. Tyndall and Frankland duly left Queenwood at the end of September. After the end of 1848 the names of Yeats and Morton did not appear in Edmondson’s advertised staff lists.

From 1848 to Edmondson's death in 1863, Queenwood continued as a stable, high grade boarding school with core staff continuing for many years and the Mutual Improvement Society achieving high level productivity. (See Chapter 12) That despite two further recorded outbursts by Edmondson; one recorded by Hirst which prompted many boys to submit resignations from the Mutual Improvement Society – not that they could leave as attendance was compulsory! The other when Edmondson in 1861 sacked the Physics Master, Dr. F. R. Smith, over a timetable dispute – for which Smith in Court recovered unpaid wages and damages. (Appendix V, N9.32)

Queenwood survived. Newspaper analysis showed that the Edmondsons created a congenial, advanced boarding school,¹⁷ attended well to student health and comfort,¹⁸ created excellent and reciprocal relationships with people in near-by Broughton and Romsey.¹⁹ Edmondson enjoyed support from a stable staff prepared to use practical methods.²⁰ Queenwood was a mid-century “milestone” in boarding school history and staff.

10.14 Notes to Chapter 10

Note 1: Thomas Hirst, Journal – original spelling - 29 September, 1850

Note 2: The candidate walked these woods in 2011

Note 3: Benson, Jane (1879) described her father's business as “ship chandler” whose small business was diminishing as shipping was moving from the nearby River Lune to the (larger) River Mersey. Holyoake (2004) also described Benson's parents as “trunk manufacturers” – presumably these included sailors' sea chests. By 1814 when Edmondson returned home from Ackworth, his parents had changed their business to “Grocer and licensed Tea-dealer” (Benson, 1879, p.63).

Note 4: Quaker 17th Century Education Objectives: The purpose of education (Thomas Lawson, 1680) was that boys and girls may appreciate the wonderful Fabrick of Creation; understand the Concerns of Life; Help, Benefit and Advantage others. [They should study] Useful and Necessary things such as (in modern terms): animal husbandry, agriculture, horticulture, chemistry, metallurgy, medicine, surgery, ‘sound’ (i.e. non-pagan) history, geography, law, arithmetic, geometry, navigation, government (Cantor, G. 2005, p.50). To include all things civil and useful in Creation ... wherein the children may be instructed in languages and sciences, in the way of Truth [and in] industrious exercises as may contribute to their maintenance (Thompson, D. 1956, p.24). Not of education but of business practice, George Edmondson appeared to subscribe to a Quaker principle of “fair value for money” as exemplified by this incident of August 19-20, 1847 recorded by John Tyndall in his personal Journal. The start of teaching at the new school was delayed, John Tyndall did not meet any of his students until August 23 and it was September before Edward Frankland arrived at the school. Tyndall by arrangement with Edmondson came from Manchester to London on the evening of Thursday, August

19 and was immediately impressed by the lodgings in central London arranged by Edmondson – “a most commodious house clean, elegant and comfortable –kept by a Quaker.” Tyndall was further impressed by “a capital breakfast” for “one shilling and eight pence” and that guests were “charged eight pence a day to their bill which goes to pay them (the servants)” (British Library, Nineteenth Century Newspaper Archives, 1847-1848).

Note 5: In the U.K. Census returns for 1851, 1861 and 1871 Mrs Edmondson’s first name appears as “Ann” which would be the plain form preferred by Quakers of the time. In writings about Queenwood and in one of her obituary notices her name is spelt “Anne”. e.g. The Hampshire Advertiser for November 21, 1863: “On the 19th inst., at Weymouth, aged 65 years, Anne, widow of the late George Edmondson, of Queenwood College, Hants.” It is not clear if “Anne” appears in error or reflects a small vanity by a Quaker lady.

Note 6: About 1830, F.A. Ismar, a teacher from Hofwyl, visited U.S.A. “for the purpose of observing the system of education in the famous School of Industry at [Robert Owen’s] New Harmony, in the State of Indiana.” (pp. 3-4) In the first of two public lectures in 1831, in Georgetown, D.C (Ismar (1831), Ismar said “In one respect I have lost my time, and been disappointed in my hopes” (p. 4). But he was gratified that that so many respect the name of Fellenberg, though “very few know what he has done.” (p.4) He then summarised nine Hofwyl institutions, “each [...] is distinct from the other, and especially adapted to its appropriate uses” (p.5).

Information about the Hofwyl Tertiary institute curriculum was described by Robert Dale Owen, Owen’s eldest, in his autobiography (Owen, 1874). Robert Dale and brother William attended the tertiary institute for four years about 1819-1823 at an annual cost at that time to their father of about £1,000 for the two. [In comparison, Queenwood boarding & tuition fees in 1847-8 under Edmondson were about £60 per head and under Willmore in 1864, £100 per head.]

Style and Archive Sources

British Library, Nineteenth Century Newspaper Archives. Royal Institution of Great Britain: from the John Tyndall archives 480 scanned typescript pages which included:

John Tyndall’s Journal for 19 August 1847 to 17 December 1847 and 29 January 1848 to 2 October 1848

Edward Frankland’s Journal: 1 January 1848 to 25 September 1848.

Thomas Hirst’s Journal: 6 September, 1850 to 31 December, 1850

Society of Friends Library, London: scans of five issues of *The Queenwood Reporter*, 1847-8

The daily diaries of John Tyndall, Edward Frankland and Thomas Archer Hirst with respect to their periods at Queenwood College were obtained by scans of appropriate pages (typed version) from the Tyndall Archive at the Royal Institute, Albermarle Street, London in 2011.

Contemporary newspaper information about Queenwood activities was obtained during 2011-12 via the programs available at the State Library of Victoria, Australia for accessing the digitised newspaper files of the British Library

Chapter 11

QUEENWOOD UNDER WILLMORE 1864-96

Queenwood College provides Practical chemistry, Natural philosophy, Mathematics, Modern languages, classics, &c (Title page of Willmore's 1864 Prospectus).

11.1 Willmore and Queenwood – a more detailed view

The student testimonials from the strong Old Boys' Association that functioned in Manchester and London, and the information from contemporary newspapers reported in this and the previous chapter suggested that students under Willmore, as under Edmondson, gained and appreciated an excellent school experience.

Writers expected Queenwood to lose its claim as an advanced science school far earlier than it did. Thompson (1955, p. 253) wrote "The college [...] had by 1855 outgrown its strength." Royle (1998, p. 211) in discussing the College's accrued debts, also in 1855, wrote: "An interesting and worthwhile experiment in progressive education therefore came to an end." But the school continued from January 1, 1864 under Charles Howson Willmore, strongly supported by John Tyndall until Tyndall's untimely death in 1893. By searching contemporary newspapers the little information previously available about Willmore's 32 years in control has been expanded to gain a picture of Willmore's personality, activities and promotion of the College.

Willmore continued the science tradition of Queenwood; in doing so he was endorsed by eight Fellows of the Royal Society and an eminent medical professor. He continued to advertise the school into 1894 and the newspapers continued to report school news during 1895. Willmore closed the school in 1896. He continued to live in the school building. Tragically, he lost his life in 1902 when fire destroyed the building that had been Queenwood College – and before that, Harmony Hall.

11.2 Willmore's newspaper silence in his first year

In Appendix N9.38, Willmore is introduced as headmaster of "a large school in the north of England" (*Hampshire Advertiser*, 21 November, 1863). Brock (1996, p. 19) describes him as "another progressive teacher who had been running a small school, Linden Grove, in the Cheshire countryside." The advertisement noted in Appendix N10.40, implies that Willmore had been in charge of Wilmslow School, Cheshire, immediately before he took over Queenwood College.

Puzzling is the fact that a search of newspapers in Willmore's first year failed to identify any statement by Willmore or report of any interview with him or advertisement by him about his experience, qualifications and plans for Queenwood. Willmore's prospectus and his later advertising indicated that it was his intention to continue Queenwood as a first class science school but, in his first year, he did not appear to send any message by newspapers to potential parents and the public. Willmore's prospectus (1864) would have told us more about his intentions but only the title page survives in The Friends' Library, London. It is a delightful engraving which shows the full extent of the tree-surrounded college building, the lodge-keeper's cottage, boys playing in fields to the upper right and rich-looking corn stooked in the middle-left. The caption is cited above. There were no signs of any press advertising by Willmore until July 1865 but much by staff who had left since Edmondson's death and developed their own enterprises. Collectively, their advertising could have contributed an impression that Queenwood College had closed. [Refer to Note Chapter 10.1].

When Willmore started to advertise in 1865 he showed himself disinclined to promote himself or his school or, perhaps, he was innocent of the idea that advertising could convey a favourable impression of the school to potential parents. Between July 22 and December 16 1865 he placed the one advertisement nineteen times in the *Hampshire Advertiser*. As indicated in N41 of the Appendix to this chapter, this was a simple invitation to request information from, or make application to himself, as principal. The advertisement suggested no reason why any parent might apply for "particulars" and was restricted to the Hampshire - Southampton area where, as indicated in Appendix N9.30, there were many schools but conservative in type and oriented to entry to the navy or the army. Willmore could have directed his advertising to his strength: the areas from which the school was gaining its students. It was not until 1868 that Willmore widened the area of his advertising by placing notices in the London-based, national publication, *Pall Mall Gazette*. But, again, during the latter part of 1868 and the beginning of 1869 his small advertisements were "out-spaced" by advertising irrelevant to Willmore's Queenwood. For October 8 and 12, 1868, the publishers, Longmans, Green, advertised their new publication: "*Elements of Plane Geometry* by Richard P. Wright, formerly teacher at Queenwood College, Hampshire, with a preface by T.

Archer Hirst, F.R.S, &c., Professor of Mathematics in University College, London” [Appendix N10.42]. Then Wright’s book was reviewed in *The Literary Examiner* (London) for January 9, 1869. The review noted: “[...] it is a capital school-book, and worth the notice of all teachers” [N10.42]. A year later, in January and February, 1870, John Haas, modern languages teacher for fifteen years under Edmondson, advertised in the *Hampshire Advertiser* for students for his school in Switzerland. [N10.44]

11.3 Willmore’s staff and the 1871 Census

Unlike Edmondson, Willmore did not advertise his staff details at any time in his thirty-two years at Queenwood College. It was through news items, Pippard (2002) and the staff register of Clifton College that the author learnt that Willmore was fortunate to have initial continuity in his Chemistry department with Heinrich Debus as Chemistry master for four and a half years before moving to Clifton College, Bristol in first term of the 1868-69 year. Debus’s successor, Dr. James Bottomley, first came to notice through a news item in the *Hampshire Advertiser* for 6 March, 1869 which reported that Professor Bottomley lectured on Poisons at the Romsey Mutual Improvement Society [N10.43] and the 1871 Population Census which listed him as “John Bottomley B.A., D.Sc. Science Master,” a resident on Census night. A report in the *Hampshire Advertiser* for 19 February 1881 refers to “Dr. Hake, FCS, Professor of Chemistry at Queenwood College” [N10.67]. No information was noted about any Physics teachers. The 1871 census provided information about the College residents and allowed statistical comparison with staff and students resident on Census night in 1851 and 1861. In 1871, in the College building were Charles Willmore, then 39; his sister, Sarah Elizabeth Sparks, 41, Lady Housekeeper; Henry Sparks, brother-in-law, 48, Drawing and Writing Master; Hannah Sparks, 10, niece; James Bottomley, 32, B.A., D.Sc., Science Master; George John Richards, 41, English Master; Thomas Edmund Grice, 21, English Master; William Cooper, 31, Gasman; Emily Hibberd, 25, Nurse. The Census listed 65 students in residence.

There were thirteen resident domestic staff: an Under Housekeeper, age 48; Upper Wardrobe keeper, 33; Under Wardrobe keeper, 20; Upper Waitress, 22, an Under Waitress, 22; First Housemaid, 20; Second Housemaid, 24; Third Housemaid, 19:

Cook, 24; Kitchenmaid, 18; Scullerymaid, 21; Laundress, 22 and a second Laundress, also 22.

In the first of the two Queenwood cottages, presumably the two built by Edmondson [N10.3] were James Arthur, 56, Gardener; his wife, Ann, 53; their son, Charles, 22, listed as Labourer and their niece, Jane Dyaser (? - Census entry not clear), 15, listed as scholar; in the second cottage were John Howson Willmore, 32, listed as the College bookkeeper, his wife, Louisa, 36, and their two children aged 6 and 4. Altogether, in college or the school cottages, 95 persons were in residence; eight of whom were Willmores or Sparks.

Comparing the 1871 census information with that for 1851 and 1861 during Edmondson's time, it may be seen there was little change in student numbers over twenty years but the median age of students reduced. In part, 1851 to 1861, that was caused by closing the agriculture student section which had had older students.

Table 11.1 Queenwood students in residence on Census night: 31 March

Student ages	1851		1861		1871	
	Edmondson		Edmondson		Willmore	
Total	61	100%	75	100%	65	100%
Over 17	11	18.0	1	1.3	-	-
16-17	9	14.8	11	14.7	6	9.2
15	14	23.0	15	20.0	15	23.1
14	13	21.3	16	21.3	18	27.7
13	5	8.2	11	14.7	10	15.4
12	8	13.1	7	9.3	6	9.2
Under 12	1	1.6	14	18.7	10	15.4
Median*	15.3		14.7		14.4	

* 50% above this age Source: National Censuses

As secular holidays such as Easter Monday and Bank holidays were introduced by the Government the College moved in 1872 from two terms a year to three. The 1881 and 1891 censuses were conducted in school Easter holidays and gave no information about numbers of Queenwood students in residence.

11.4 Extra-curricular activities under Willmore

The *Hampshire Advertiser*, September 29, 1869 reported that the Queenwood College cricket team “narrowly defeated the Sherfield Park cricket team.” As during Edmondson’s time, Queenwood sporting results were reported in the local paper [examples in N9.26 and Appendix N10.45, N10.51, N10.53, N10.54, N10.69 and N10.79]. They covered cricket, football and athletics and were played against or shared with local sports associations or took place at Old Boys’ events at Queenwood. They were not played with local Grammar schools. No school advertising was noted for 1879 but a news item [N10.62] about tame crows at the school raised by the boys appeared in the *Hampshire Advertiser*, 4 October, 1879, and subsequently reproduced in other newspapers, indicated that the Queenwood College Mutual Improvement Society was still in action.

11.5 Willmore’s character

Compared with Edmondson, Willmore appeared to be more in daily touch and empathy with his boys as illustrated by his tolerance for the boys taming crows and having them about the school buildings [N10.62], his notes in the school paper about the auction prices of birds’ eggs and the newspaper account [N10.53] of Willmore taking his boys to participate in an athletics meeting where his impartiality was exemplified by his contributing a prize for an event not open to the skills of Queenwood College students.

A glimpse of Willmore as a chemistry enthusiast was obtained from the report in the *Hampshire Advertiser*, 20 May, 1871 of a celebration at the College of successes in chemistry by an Old Boy, Dr. Hopkinson. Hopkinson referred with gratitude to his six years with Willmore, which included some years at Willmore’s previous school. [Appendix N10.54].

Willmore was able to mix with people. For example, at a Christmas function in the near-by village of Broughton the *Hampshire Advertiser*, 4 December, 1869 [N10.46] reported that Willmore took part in an evening of “songs and readings” at which he delivered with “much feeling” Tennyson’s “Grandmother’s Apology” [N10.46].

During 1871, Willmore continued advertising modestly in the *Hampshire Advertiser* and the *Pall Mall Gazette* and his advertisements became more positive, though to

readers unaware of the character of the school, they could have been inserted by a coaching college. For example, in 1871 [N10.55] it was stated “Preparation for the London Matriculation Examination.” In 1873, Willmore widened his message to state “Preparation for the London Matriculation Examinations and for the Royal College of Surgeons,” adding that, “Queenwood College has long been celebrated for the scientific training it affords” [N10.60]. Willmore’s statement was well supported in the *Pall Mall Gazette* for January 14, 1874 [N10.61] where he was able to quote the names of six Fellows of the Royal Society as College referees: Dr. Debus, F.R.S., Dr. Frankland, F.R.S., Dr. Roscoe, F.R.S., Dr. Angus Smith, F.R.S., Dr. Tyndall, F.R.S., Dr Voelcker, F.R.S., to which he was able to add Dr. Williamson’s in the following year.

Willmore opened his 1880 advertising in the *Pall Mall Gazette* for January 20 with a short but market focused advertisement than he had previously used. No longer relying on the endorsement of the first seven Fellows of the Royal Society, he stated benefits which the school supplied: “Scientific, technical and classical training and preparation for University and Competitive Examinations” [N10. 63].

When the British Association for the Advancement of Science held its 1882 meeting in Southampton, Willmore was able to place an advertisement immediately ahead of the BAAS announcement to invite Old Boys attending the meeting to visit Queenwood and bring their friends [Appendix N10.72].

He repeated this advertisement in the *Pall Mall Gazette* for April 3, 14 and 21 but no further advertising was noted for 1880. In 1881 Willmore placed notices only of term dates in the *Hampshire Advertiser*. In 1882 and 1883 Willmore sparsely used the above advertisement [N10.63] in the *Pall Mall Gazette* and the *Hampshire Advertiser*. No advertising was noted for 1884 and in 1885-94 he mostly used only the name of the school and the date of the following term excepting for 11 June, 1892 when he was able advertise endorsement by an eighth Fellow of The Royal Society, W. Crooks F.R.S. and the eminent Dr. George Vivian Poore, F.R.C.P., a Professor of Medicine and Medical Jurisprudence. [Appendix N10.71].

We may imagine that had Edmondson received such endorsements whatever restrictions, if any, the referees placed on using their names, he might have stimulated a reporter to explain the importance of each referee and the significance to

the College of the collective endorsement by important contemporary scientists, lecturers, an agricultural consultant and a surgeon to Queen Victoria. Willmore was no Edmondson. He did not make full use of this powerful tribute to the standard of chemical education at Queenwood College and, implicitly, to his standing as Headmaster.

11.6 The Queenwood Old Boys' Associations and tone of final advertising

The school was constantly in the news sections of local newspapers during its final years through the activities of the Old Boys' Associations and functions at the school [N10.64, N10.68, N10.69, N10.70 and N10.77]. For example, The *Hampshire Advertiser* for July 23, 1881 advertised a three-day reunion of Queenwood Old Scholars would take place at the College, Saturday, July 30 to Monday, August 1. Duly the *Hampshire Advertiser* for August 06 [N10.69] reported on the Queenwood reunion at which the "unpropitious weather throughout" did not dampen enthusiasm. An advertisement [N10.70] in the *Hampshire Advertiser* for November 19, 1881 announced that the annual dinner of Queenwood College Old Boys would take place at The Criterion, London, on Friday, the 25th instant. Under the heading, "Floreat Queenwood" the *Hampshire Advertiser* for August 5, 1882 [N10.72] reported the success of a Queenwood student at the University of London.

The *Aberdeen Weekly Journal* for November 7, 1884 and other newspapers [N10.75] reported the death on November, 1884 of Dr. Henry Fawcett, the Postmaster General, of pleurisy and pneumonia. The notice included the sentence, "He was educated first at Queenwood College, Hants, under Professors Tyndall and Frankland, and then at King's College, London." During November, 1885, Leslie Stephen's biography of Henry Fawcett which described Fawcett's time at Queenwood College was widely reviewed [N10.76]. From then on, Queenwood College references constantly came from notices of the elderly or the dead, rather than of the active living: Alderman Lund [N10.78] recalled his time at Edmondson's school in Blackburn; Mornington Cannon, son of a famous jockey, attended Queenwood College [N80]; obituaries [N10.83] for Tyndall in 1893 referred to his teaching at the College. In 1894 Mrs. John Willmore, Charles's sister-in-law, who at the time of the 1871 census was living in a Queenwood cottage, died [N10.84] and in

1895, the Blue Cross cyclists were denied by rain from a final excursion to Queenwood College [N10.81, N10.86].

11.7 The legend extends

The year 1881 started with an article [N10.66] of more than 700 words in the *Hampshire Advertiser* for January 1. The writer re-worked material that had first appeared in 1848-49 [Appendix N9.4] and extended its legendary aspects of Edmondson as the saviour of Harmony Hall back to Elizabethan times. It varied the theme of “Queen Elizabeth slept here” to “Queen Elizabeth read here” - under an old yew tree in the school grounds! [Appendix N10.66].

11.8 Notes to Chapter 11

Note 1: Just nine days after becoming head of Queenwood College the headmaster of a new Middle school in Chester, Cheshire, T. G. Fraser, advertised in the *Preston Guardian* “reference permitted to the principal of Queenwood College, Hampshire.” Preston and Blackburn in Lancashire had been Edmondson’s home areas from 1825-1847 and the Queenwood Old Boys Association had a branch based in Manchester, Lancashire. Innocent in its intention but Fraser’s advertisement drew on Edmondson’s shade endorsing the school for those not aware of Edmondson’s death or for those aware, of a new Queenwood Principal endorsing another school. Also in January, and during June and July 1864, Richard Wright, Mathematics Master at Queenwood for fifteen years, advertised his new school at Southsea, Hampshire. In *The Times, London* during June and December, 1864 “Dr.” Mummery advertised his school at Uxbridge, near London, describing himself as “formerly Head Classical Master at Queenwood College. Appendix N10.40 refers to Mummery’s sacking by Edmondson for falsely claiming a doctorate]. There was nothing in these three advertisements to suggest that Queenwood still existed as all their statements reflected their writers’ time under Edmondson.

11.9 Summary Chapter 11

- Willmore either saw little benefit in school advertising or was unwilling or unable to create ‘public relations’ benefit from the opportunities available to him when he became principal in 1864, or the references provided to him in 1874 by leading scientists and science educators, and again in 1892.
- During his thirty-two years, Willmore’s newspaper advertising did not project the idea of a lively, advanced school which dissenters seeking a modern curriculum might like their children to attend, nor even provide facts as Edmondson did about Queenwood staff qualifications. But Willmore was also unfortunate in that in his early years former members of staff advertised

their new schools in the Hampshire press with references to their time under Edmondson and in his later years press reports which mentioned Queenwood were about old boys dying.

- Compared with Edmondson who used the press to fight for Queenwood, Willmore emerges from the lights and shadows cast by contemporary newspapers and his two surviving copies of the *Queenwood Reporter* as a gentleman; a friendly headmaster with great empathy for his students who would be cheering his boys at a school football match, a teacher with a love of chemistry, a man at ease with members of the British Association for the Advancement of Science, a jovial neighbour with whom you could enjoy a social evening at your own fireside – but not a salesman. Borrowing from the two chapters to come, Willmore, empathetic to his students, may be seen as an ineffective figure against the vast panorama of educational and scientific change in the last third of the British nineteenth-century

Chapter 12

STUDENT SELF-LEARNING AT QUEENWOOD COLLEGE

The higher you climb, the fewer are there to help you. You reach a summit and stand alone. You have no archetype to follow. You find you are not dependent on others. You realise “your ideal is a self-existent quality [...] this I believe to be the most important step in human education when we are able to shake away the sensuous part of our nature and to live a life of thought.” (*John Tyndall’s notes for his farewell talk to ‘his lads’ at Queenwood. Journal entry, 22 September. 1848*)

12.1 Self-learning 1847 – 1859

In the above somewhat Emersonian phrases Tyndall envisages the personal strength needed to aspire to and serve higher education. We do not know if George Edmondson had read Emerson or if Edmondson, as a Quaker was motivated by the spiritual strength Quakers required to oppose organised religious structures that would stand, as the Quakers said “between a man and his God” or as pacifists, firmly to oppose state structures that required oaths of obedience. But, early in his career as headmaster Edmondson established his own school structure that encouraged students to be independent in thought and skilled with their hands.

As recorded in Section 10.2, in his Blackburn school in Lancashire during 1827-1841, Edmondson equipped his school at Lower-Bank, Blackburn with “a printing press, a lithographic press, a turning lathe, a workshop containing tools and a carpenter’s bench” (Thompson, 1956, p. 26). As litho or offset printing was a comparatively new invention - in 1796 - for cheap colour printing and a turning lathe which, for example, could produce items of furniture, suggest that Edmondson was intent on providing up-to-date equipment with which his boys could have initial training for apprenticeships in printing or carpentry. The boys also produced their own school paper.

In the first term, August- December 1847, of his new school, Queenwood College, in Hampshire, Edmondson introduced a Mutual Improvement Society to be attended on Friday nights by all the boys and staff – though it was not clear if all the staff attended every meeting – and in the second term, on Wednesday March 29, 1848, a fete was held to mark the opening of a carpenter’s workshop for the use of the boys. History teacher John Yeats, who John Tyndall did not like, opened the facility with a

speech. Tyndall wrote in his Journal for the day. “He (Yeats) puts me in mind of the bat of Surniam [Surinam] which sucks your blood but fans the wound.”

The carpenter’s shop, which became known to the boys as “the shed”, became an important adjunct to the Mutual Improvement Society’s activities as it expanded from information-exchanging sessions (which the Society described as *conversazione*) to studying several branches of science and keeping pets – for which they made cages in “the shed” and articles for themselves such as writing desks

An important activity which came under the control of the Society was the publication of the student journal, *The Queenwood Observer*. a few copies of which, and of Term “Notes” which appeared under Willmore to replace *The Observer*, are held in the Southampton University Library which kindly made copies available to the candidate. (See *References* at end of thesis.) Lacking in the Term “Notes” are articles contributed by students which had appeared profusely in *The Observer*

When John Tyndall lectured at the Royal Institution about Physics as an essential school subject (Chapter 4.2.5) he was visualising the Queenwood College Mutual Improvement Society at work during 1847-48 and the first three months of the second school year – Tyndall’s first period as a teacher at Queenwood College. George Edmondson had established the Society as a compulsory Friday night activity for all the students (Tyndall referred to their ages as eight to eighteen and in number, eighty to ninety – which seemed too high) and for some members of staff to mingle informally and raise questions for discussion. Tyndall cited examples of the boys’ questions: Does dew rise or fall? If a towel be wetted with water, why does the wet part become darker? What is thunder? Is it contrary to the rules of Vegetarianism to eat eggs? This unplanned discussion part of the Society’ activities was referred to as the *conversazioni* and continued as a regular part of the Society’s activities though, as indicated in the following summary of the contents of the 1859 “The Queenwood Observer”, these informal discussions were not always reported in detail.

12.2 The Queenwood Observer

By 1859, a copy of the boys’ paper, *The Queenwood Observer* (8 issues a calendar year, each of 8 pages, at one penny an issue), showed that the boys engaged in a wide range of activities each week, most directly organised by the Mutual Improvement Society. The Society was responsible for producing “The Observer”, for catering for

further developing students' interests in five fields of natural history, maintaining a Society library, reporting on student's informal games in the school-yard and their woodwork activities in the carpentry shop and care of pets. There is reference in the March, 1859 issue of "The Observer" to "the committee of the common funds" buying several sets of stilts for students' play-time use and to repairing the (outdoor) gymnasium equipment. To read the following summary of one year's student activity, supported by staff and friends, is to be impressed with the vibrant student self-government and the impetus it gave the boys to learn through their own investigations. To judge from their articles in *The Observer*, some of the boys, like Tyndall and Frankland during vacations a dozen years before, could not pass the ruins of an abbey, a modern factory or a mine without investigating it to understand its functions.

The student editors for 1859, W. G. Chambers and W. Flight, each listed "A.A" after his name signifying he had gained Honours standard at the Senior level of the initial Oxford Middle-Class Examinations held in the previous year and for which he had been awarded the rank of "Associate of Arts"

The headmaster, George Edmondson was President of the Mutual Improvement Society, the Modern Languages Master, John Haas, was Secretary and a student, T. G. Hawes, was Treasurer. Ten students were responsible for the scientific interests of the Society; two each were "Curators" for Mineralogy, Zoology, Ornithology, Entomology and Meteorology. In addition, three students were responsible for the Printing Office, two for the Library and two for the Museum to give a total of twenty students who accepted responsibilities.

In each issue, the lead article, under the title of "Local Information" presented a report on lectures by the Science Masters; detailed the informal games played by the students, results of games with a Winchester school and/or local sports associations; the progress of their hobbies, and such things as progress in developing work on school grounds; the flowers blooming in the school gardens; the building of Mr Edmondson's green-house, progress in extending the hot-water heating in classrooms and other happenings in the grounds or school buildings. We learn that over February, March, April, May of 1859, Dr. Heinrich Debus lectured on boron, silicon, potassium, sodium, magnesium, strontium, aluminium, zinc, nickel, cobalt and iron;

their compounds and uses. In August, September, October and November-December, the first five months of the new school year, Dr. Debus introduced the basics of chemistry: elements, composition and decomposition; distribution of minerals in nature, discovery and preparation of oxygen and hydrogen.

Dr. F. R. Smith who was in charge of Physics was not able to give any lectures during the first six months as he was slow to recover from the effects of a railway accident in the previous December. He resumed in August, 1859 with a discussion of Natural Philosophy "as developed by the ancients"; atomic structure, statics, dynamics and meaning of force. In September he discussed forces opposing each other at angles and means of applying forces with various types of lever. In October, he reviewed Laws of Motion, Attraction of Gravitation, Equilibrium, Atwood's Machine ("invented in 1784 by the English mathematician George *Atwood* as a laboratory experiment to verify the mechanical laws of motion with constant acceleration.") In November-December Dr. Smith presented hydrostatics, hydraulics and pumps.

The Observer does not state how many evening lectures were presented to cover the above topics; one assumes not less than one a week, by each lecturer.

The individual issues for the year provided the following information.

Issue 7/1 Feb 1859

The boys returned to school after the Christmas-New Year holiday to find that half the copse had been made over to the new cricket field. Their popular games were football, rounders and prisoner's base. With mild weather, snowdrops, violets and primroses were blooming. On Feb 21, Edmondson gave the first extra half-holiday for the year. "The principal productions of the workshop were writing-desks, and cages for dormice, but the great work of art of the month was a pigeon-house

Issue 7/2 March 1859

"The committee of the common funds has bought several pairs of stilts, which have been in great request, and elevated on which amateurs may daily be seen stalking through the playground. The same gentlemen have also set about repairing the gymnasium, which is beginning to come into use. Cricket is gradually replacing rounders. – Several new varieties of domestic and other pets, are kept in hutches, boxes and cages in corners of the playground.

Issue 7/3 April, 1859: Half of the old farm buildings are pulled down, all should be gone by next month. Cricket Club reformed but weather not good. On the 19th Herr Bosco gave performance in the lecture room of a “variety of tricks and sleight of hand, with which we were highly delighted.”

For Easter holidays about two-thirds of students went home. Remainder amused themselves with excursions to Stonehenge and Old Sarum; Quarley Mound and Danesbury Camp; Rufus’ Stone in the New Forest; Salisbury and Winchester Cathedrals; Romsey Abbey; the ruins of Beaulieu and of Netley; Southampton Docks and the government establishments at Portsmouth.

Issue 7/4 May 1869: Little news: Chief amusements in the play-ground were cricket, gymnastics, the giant-stride and throwing lances. On the 13th May Mr E gave us a holiday and we played at cricket all day at Norman Court. The (annual end-of-year) Concert takes place on June 10th; break-up on June 13th

Issue 7.5 August 1859

Public Exam results:

London University, Matriculation:

W.R.Fox* passed in Second Division

Mr W.G. Lush, formerly of this College, passed in First Division with Hons in Chemistry

London University Course results

Mr E. Fox who only matriculated twelve months ago, won the Gold Medal in Practical Chemistry

Royal Military Academy, Woolwich:

Mr F. Firebrace, ex-editor of the Observer, gained 4th place of the forty who passed the entrance examination.

Oxford Middle-Class Examinations (1859)

Seniors

First Division: T.S. Barrett, Honours in Physics and first place in order of merit

Second Division: E. Muir and F. Backell

Mathematics, Second Division: T. S. Barrett and E. Muir

Languages, Second Division: A. Willett

General Division: W. Chambers

Juniors

First Division: W. Spencer

Second Division: W. A. Raper

Third Division: H. J. Cooksey, G. Stephens, H. M. Turner

(*Dr. Fox, a local practitioner and Queenwood College doctor, had four sons who attended Queenwood College. At least two also attended Richard Dawes's elementary school at King's Somborne.)

Issue 7/6 Sept 1859

On 8 Sept, a school holiday permitted the boys to play a cricket Eleven from Winchester on Woodbury Down and provided opportunity for the school to visit ancient "Camps" which were described in the previous issue as "very abundant in Hants and Wilts" and "antiquarians were at a loss to ascribe them to the Romans. Britons, Saxons or Danes" nor was the original purpose clear; some seemed to be burial grounds, other village sites or encampments.

The news report included the items that Mr Edmondson "was erecting a new green-house on the north side of the College" and that the Andover-Redbridge canal on which Queenwood people had skated in winter was to be drained and converted to a railway line.

Issue 7/7 Oct 1859

In the general news: shinty or hockey was being played in the school-yard; on some frosty mornings games of football. Mr Edmondson's new green-house had been completed and additional hot-water pipes installed in the house. On 14 Oct there was a successful concert in Broughton directed by the school music master, Mr Cornwall, at which children from five villages performed.

Issue 7/8 Dec 1859

On 11 Nov there was “a pleasant evening party when we took tea in the Long Room and afterwards played a variety of games in the lecture-room.” “Mr. Edmondson gave us two or three extra half-holidays, which were very acceptable (because of recent heavy fogs and rain). Boys took opportunity to visit the Great Eastern in Southampton Water, Netley Abbey and the new Victoria Hospital for invalid soldiers which is to have a frontage to the river of 1400 feet.

On the play-ground we played shinty and football and “minor games such as leap-frog, prisoner’s base, sliding, &c.”

“We caught a number of dormice...many for exportation to the north where, we are told, they do not exist, or are not to be found.”

12.3 Contents of *The Observer*

So much activity; so many impressions arising from the school notes and the following list of lectures given at meetings of the Mutual Improvement Society and papers published in *The Observer* (see Table 12.1) ! The school had changed since Edmondson acquired it a bargain price in 1847. Originally designed by Robert Owen and architect Joseph Hansom to accommodate three schools in the rear building which would be conducted on monitorial lines. For their resident pupils, there were eight dormitories; each with fifteen beds.

Edmondson had built class-rooms outside the original building, the plans and levels for which Tyndall had developed in the school’s first term. Now, twelve years on, the boys’ playground might have looked messy but it was a hive of activity! The outdoor gymnasium occupied one corner; the cages, built by their owners for their assortment of pets (not birds) occupied other corners, all overlooked by a dovecote built by the boys. Mr Edmondson’ new green-house was safely built on the other side of the school building, away from stalking stilt-walkers and vigorous ball games The “committee of common funds” which is mentioned once in the year’s publications, was, perhaps a joint school-student fund, which maintained equipment and paid for new items.

Notable lectures given to the Mutual Improvement Society during 1859 included Edmondson’s on Waste Management, Tyndall on his work on Glaciers (he was a life

supporter of Queenwood despite his criticism of Edmondson in May, 1948) (Chapter §10.19). There were Tom Hirst's articles about Rome - he had taken his sick wife to a warmer climate - and an extraordinary article containing a first-hand account of the British defeat near Tianjin in the Second Opium War with China. It could hardly have been written by F. Firebrace, a former Observer editor, (see above) who had entered the Woolwich Naval Academy just a month before the battle.

Table 12.1 Articles^a in The Observer and/or lectures* at the Mutual Improvement Society during 1859

Issue	<u>By Students</u>	<u>By Staff or Friends</u>
Vol 7.1 February *Mutual Improvement Society presentations	*T. G. Hawes-Iron ships *W. Little – Wild Cat ^a W. Flight-Printing Manchester newspapers ^a W. G. Chambers-Hermit Crabs ^a W. Flight - Mt. Vesuvius Lava: Chemical analysis ^a W. Fox-(Ancient) Barrows near school <u>Conversazioni topics</u> Halos, spider threads between trees, capsicum, Rupert Drops. &c	*Mr. Edmondson – Utilization of Waste Substances (1) ^a Anonymous -(Prob. Tom Hirst) -Letter from Rome about Ancient Monuments ^a Martinus Scribblers -The Moon
Vol 7.2 March	*Mr. W. Beck-Astronomy (2) *H. Michell-County of Sussex *W. A. Raper-India-rubber: history. manufacture, uses *W. Little-Guinea Pig *C. Brandon-Crows *H. Foster - Marmottes *T. G. Hawes-Origin of Mormonism ^a W. Flight- Manchester Newspapers cont. ^a T. G .Hawes – Adventure in Calabria (trans from Fr.) ^a T. S. Barrett Contents of a Colour Box (origin and preparation of colours)	^a Martinus Scribblers -Natural History in the OldenTime
Vol 7.3 April	*W. Little - Scotland (2) *W. Chambers - Biog. of Lord Nelson (with much feeling) *F. Hawes-Flowers of the Month *H. Field-Locusts *T. G. Hawes-Is the term “broken-hearted” a mere figure of speech?	*Mr J. Haas - Fénélon’s Adventures of Telemachus *Mr. Edmondson – Utilization of Waste Substances (2) *W. Beck–Nebulae ^a F. H..-Food gathering by Marmottes and Water-rats ^a M .S.-Kepler and Modern Astronomy ^a D. B. B.-Persian ruler’s excessive use of opium

	<p>*T. G. Hawes-Calabria contd.</p> <p>^aW. Flight-Westbury Iron Works: distribution of the ore; analysis; iron production</p>	
<p>Vol 7.4 May</p>	<p>*T. G. Hawes-Catacombs of Rome (Illustrated)</p> <p>*W. Little-Principal Towns & Manufactures of Scotland</p> <p>*R. Claude- Composition, manufacture of Gunpowder & Guncotton</p> <p>*P. Colson-Progress of the art of constructing musical instruments from the earliest times, and the Power of Music in exciting or representing a variety of feelings</p> <p>*T. G. Hawes-Aerolites (meteorites)</p> <p>*W. Little-Weasels, stoats and ferrets</p> <p>*H. Foster-Dogs</p> <p>*F. awes-a botanical paper</p> <p>*H. M. Turner-The 1797 Mutiny at Spithead and the Nore (to be delivered)</p> <p>^aW. A. Winckworth - Zouves leaving Paris for War</p> <p>^aR. Claude - How to win a Law-suit</p>	<p>^aD. H.- Beaulieu Abbey</p> <p>^aGurney - Wood Engraving</p> <p>^aW. A.W. Hawking in Algeria</p>
<p>Vol 7.5 August First mnth of new school year</p>	<p>*R. Claude - A Tour though the Lake District</p> <p>^aW. A. Raper - Ancient Coins</p>	<p>*Mr. Edmondson-the Great Eastern Steam Ship</p> <p>*Mr. Brightwell (Surveying teacher) 3 lectures in Aug.</p> <p>- Tennyson's Idyll's of the King</p> <p>- Fabulous Animals</p> <p>- Life & Character of Mirabeau</p> <p>*Mr. Haas- Origin of English Surnames</p> <p>*Dr. Hirst (back from Italy) The Battle Fields of Lombardy</p> <p>^aW. F. -Hydro-Platinum Gas</p> <p>^aW. G. C.- three lectures</p>

		<p>-Jersey Kale or Cow Cabbage ^a – King Arthur ^aH. F - Talking Fish</p>
Vol. 7.6 September	<p>*E. Wilson-Life of George Stephenson, Engineer *Professor Tyndall - Glaciers *W.Flight-History, Physical and Chemical properties of Lead (illus.) ^aC. Bethell-Camera Obscura ^aE. Austin-Excursion to Bank of England</p>	<p>^aW. F -Concerning Vines ^aA. G. & F.D.-Bull-Fights in Peru ^aAnonymous-Don Quixote</p>
Vol 7.7 October	<p>*Mr. E. Fox – Digestion *W.A. Raper - Ancient coins *G .Stephens - Geology and Use of Quarried Stone *Mr. Edmondson-New Method of Supplying Water to Locomotives and Purification of the Thames *C. Bethell-Rupert’s Drops *Mr. Haas- Xmas Day and Avalanches *L. Grubb-Round Towers of Ireland *Mr. Brightwell - Humorous Account of Cricket Match between England and Canada</p>	<p>^aW. G. C.-Manufacture of Aerated Bread ^aW. F.- Furness: Northern Lancashire, produced 438,546 tons of iron ore in last year. Contrast with nearby ruins of Abbey of St. Marye ^aJ. W. W.-Ferns: Review of book useful for botanists and gardeners Anonymous (“A gentleman serving in the fleet and present at the action”)- The Attack on the Peiho Forts.</p> <p>[[]In the Second Opium War, a British Fleet with troops, some French support and a small American vessel , attacked the Peiho Forts, near Tianjin, a gateway to Beijing. The British were heavily repulsed, losing 400 troops and four vessels.]</p>
Vol 7.8 December (Covering November-mid December)	<p>*E. Austin-History, Construction and Uses of the Diving Bell *C. Bethell - Virgil’s Aeneid *R. Hewett-Life of James Watts *H.J . Cooksey - Model steam engines *H. M. Turner -- Portsmouth & Neighbourhood *H. Field -Ancient Peruvians, Balboa & Pizarro *Mr. Brightwell - Life of Shakespeare and Massacre of St. Bartholomew’s Day <u>Conversazioni topics</u>: Many questions in chemistry, natural philosophy, language, arts & manufactures</p>	<p>^aW. F. -Rainfall of England ^aAnonymous - Catching Trout ^aAnonymous - Chalk ^aW. -The Fox and the Rooks</p>

12.4 School Notes: 1887-1893

The next account available of activities at Queenwood College is for 1887, 28 years from the time of the previous notes and the 24th year of Willmore's headmastership.

Willmore no longer leases the 500 acres or so of farmland but the school notes, now illustrated with photographs, show an attractive school with its playing fields, student playground and flower gardens. The student newspaper, *The Queenwood Observer*, no longer exists and Willmore is now 55. In place of *The Observer*, School Notes are issued each term under the banner:

Queenwood College
Hants

Notes of the ... Term. 1887

[It should be explained that the College has no Winter Term: Autumn Term is the first of the school year: August-December; after the Christmas-New Year break the boys return to the Spring Term, of variable length, to Easter; the Summer Term is long: from Easter, to the end of the school year in July.]

The Notes include comings and goings of staff, results of students' and old boys' examinations, student activities, events of the Mutual Improvement Society (now with five students on the committee – there were twenty in 1859), school sports results, the general state of the weather, the condition of the flowers around the playground, astronomical events, the opening of a new tuckshop in Broughton and a section headed "Chronicle" which lists the routes of school Sunday walks, daily weather, half-holiday excursions and notable events such as the breakdown of the classroom heating system. There are few student contributions. In the Notes for the Autumn Term, 1887, there is a somewhat weary note to the effect that the Mutual Improvement Society will conduct no activities for the remainder of the term nor in the Spring term to follow; after which (in the new school year) it will return to full activity "possibly on slightly altered lines, and we feel sure that there will be a compensating freshness in our approach" (Notes of Autumn Term, 1887, p. 2).

Notes of the Spring Term, 1888 reports "hard frosts, rain and snow" interfered with school activities but at the end of February it was "relieved by a week of splendid sledging" in the school grounds. After a lapse of some years, the boys' interest in

gardening revived and at end of March they brought to life plots around the playground with colourful flowers. The keen activity of the boys to collect and classify birds' eggs was thwarted by the late spring. A clue to the authorship of *Notes* is given by the editorial reference to the price of Great Auk's eggs at London auctions – a topic which Willmore discussed in an 1864 issue of the then official school paper, *The Queenwood Reporter*, shortly after he became owner and principal of Queenwood. In the reference it was stated that C. Leopold Field, a former Queenwood science lecturer, had paid 160 guineas for a Great Auk's egg in the previous December sales but his bid in March of 200 guineas was defeated by one of 225 guineas, thought to be on behalf of an American collector. The editor reported two new member of staff at the beginning of the term: Mr. A. J. Jackson B.A. Hon. (Lond.) for Mathematics and Mr. F. Hird B.A. Natural Science (Camb.)

Notes of the Autumn Term, 1888. The Editor announced that this first term of the 1888-89 school year “affords no very striking events to chronicle” but brings out an issue of 36 pages! Most, however, constitute a *Christmas Supplement* with material from previous lectures or articles.

Who is now the editor? It could be Willmore himself to judge from phrases such as (the term) “has been one of good steady work, as regards school studies” and “many of the arrangements are still such as old boys will remember them to have been years ago.” The arrangements described were not as the very old boys would have remembered them! As described in the issue, they had become: “The First Class (Senior Class) Laboratory on Wednesdays from nine to one; the general geography lessons on Wednesdays before breakfast; the land surveying from eleven to one on Saturdays.”

In the general news it was announced that Frederick Sherman Toogood who was at Queenwood for the three years from January, 1887 recently graduated M.D. from London University and had become the Medical Superintendent of Shoreditch Infirmary.

The Mutual Improvement Society had come back to life after a year's recess. As a sign that numbers of students were diminishing, the Society, comprising all students, could now hold its meetings in “No. 13”, the rooms once occupied by Mrs. Edmondson. The Society planned an early concert by the members, two meetings for

contributed lectures and an exhibition for the end of term. At the first general meeting, student Andrew Pears, lectured on Cavendish, the man and his scientific achievements. At the second meeting, three members of staff contributed lectures: Mr. Addymore on The Frog; Mr Willmore on Pallas's Sand Grouse, a migratory Asian bird that occasionally visited England; Mr. Hird on Vortex Rings. Mr. Willmore gave a literary evening in "No. 10", once Mr. Edmondson's rooms, with Tennyson's verse and readings his main topics.

The Exhibition held on 18 December 1888, included exhibits of wood turning and fretwork, a working microphone and a working telephone, stuffed squirrels, drawings and water colours, "beautifully set and arranged"; collections of moths and butterflies and a laboratory preparation of Picric Acid. For the end of term concert, two days later, the Science Master, Mr. Addyman, with student assistants, arranged decorations of greenery and electric lights. The school broke for Christmas the following day. Many of the students took their pets home in the cages they had made in "the shed".

The committee of the Mutual Improvement Society for the term consisted of Mr. Willmore, President and Secretary, three members of staff including the Chemistry and Physics Masters and seven students occupying between them, eight positions. The remaining 29 pages of the Autumn Term Notes included details of the Concert, Sunday Walks, the Weather and a Christmas Supplement of 21 pages, consisting mainly of anonymous and miscellaneous contributions from events of previous years.

The next Queenwood papers available are for 1893 and are slim. The first consists only of three pages, two of which constitute "A Programme of the Holiday Eve Entertainment." The first page seems to indicate that the Mutual Improvement Society has given way to "The Queenwood Association for Promoting the Study of Literature, Science and Art".

The Notes for the Spring Term, 19 January to 29 March, 1893 constitute eight pages. The state of the weather - two cycles of wintery to sunny, spring weather - occupy the first page. The second and third are devoted to the school's absorption in games of *paper chase*, preparation for which and its exercise take up two pages, a visit to a Quakers' burial ground near Andover most of the fourth, then comes a reference to

the *Association*, meaning of which becomes clear in the three-page Note for the following.

12.5 The Queenwood Association

The Queenwood Association for Promoting the Study of Literature, Science and Art has become the umbrella organisation for out-of-school activities. Mr. Willmore is the President and Chairman, Mr. H. E. Stewart, B. A., Secretary and Librarian. The Committee includes Mr. W.H. Willcox, B. Sc. and four students. A fifth student is Workshop Curator. The program for the Autumn Term, 1893, consists of eight events: Three evening lectures by staff: Willmore on the Association Library, Willcox on Bacteria, Stewart on The Planets, three meetings specifically for the boys entertainments and lectures, a school excursion to Southampton, the end-of-year exhibition and the Concert. It is clear that the boys are carrying less responsibility for administration of out-of-school activities than in the former days of the Mutual Improvement Society – the inference is that school numbers are falling.

12.6 Final publications

In the final documents available to the candidate, that inference is supported by an undated article by Willmore, “Queenwood is a Private School” in which he extols the benefits of a small school in which the student gains proportionately greater care and attention from staff.

He implies that competition has increased from city day-schools.

To send a boy to a good day-school may perhaps come nearest to securing the combined advantages of home-training and school life. This idea may in part be the reason why the large Grammar Schools and similar institutions have become of late years so increasingly frequented. (*C. Willmore, p.2 of undated article thought to be 1892 or 1893*)

Attached to the article is a two-page Prospectus for Queenwood College in which Willmore presents a brave front. The school is now served by two railway stations and has a telegraphic address. For nearly fifty years it has supplied a curriculum “in accordance with the real requirements of the day,” “Its resident lecturers have included Tyndall, Frankland, Hirst.” “There is a large and well-equipped laboratory in which many important researches have been carried out.” Famous alumni have included “the late Henry Fawcett, the late Dr. Tilbury Fox, the late Marcus Beck and Dr. John Hopkinson,” “The Evening Lectures ... form a great feature of the College

course”. “It has always made Science part of the pupils’ course of study.” “Great encouragement is given to the formation of Collections in Ornithology, Botany, Entomology, for which studies the neighbourhood offers exceptional advantages.” In their leisure time, the boys are able to pursue “Carpentering, Taxidermy, Microscopy, Photography and other useful pursuits.

Willmore referred to the 30 acres of College grounds encompassing separate cricket and football fields, gardens and orchards; its own supply of fresh water, milk, fruit and vegetables.

Tyndall died on 4 December, 1893, possibly after this Prospectus was published, or Willmore could have referred to his life-long support for the College. But, it was in vain! Possibly, the competition from city day schools which Willmore referred to, and as discussed in Chapter 7, experienced a large increase in students and curricula in the 1870-90 period and, also, the growth of municipal technical schools and universities overwhelmed the resources and defeated the attractions of a small, private and relatively expensive country boarding school. Willmore closed Queenwood in 1896.

Chapter 13

FREDERICK SANDERSON CREATES A SCIENCE-BASED CULTURE AT OUNDLE SCHOOL DURING 1892-1922

I saw my own sons get an education there (at Oundle) better than I had ever dared hope for them in England ... all the educational possibilities ... things a little too extravagant even to talk about in our dull age, I found being pushed far towards realisation by this bold, persistent, humorous and most capable man. (Wells, 1924, p. 3)

The first duty of the Science Master is to inspire his boys with the love of Science, to let them feel the mysteries of science, and the mysticism of it. (Anonymous, 1923, p. 357)

13.1 Sanderson's independence

This chapter describes Frederic Sanderson's organisation of Oundle School at the end of the nineteenth and beginning of the twentieth century and his post-war visions for the school and society. Sanderson was appointed to Oundle School to add modern elements to a school which had been exclusively classical and owned since 1556 by the London Guild of Grocers, Constitutionally, Sanderson was responsible to the Governors of Oundle. In practice, Sanderson continually led the Governors in the one clear area of their responsibility: ensuring adequate boarding accommodation for the number of students available. Sanderson used his own money to buy property as he deemed necessary and, subsequently, sold the property to the Governors. By his actions, Sanderson made himself as free of external control as the other headmasters discussed in this study. The following sections show how Sanderson developed his grand design for Oundle, the sources of his inspiration, the curriculum he developed and its delivery to students. The Notes to the chapter indicate the scientific sophistication achieved at Oundle and the expansion in demand for science graduates during his time as a teacher and headmaster.

13.2 Early days

Frederick William Sanderson was born on 13 May, 1857 in England, in the village of Brancepeth, four miles south-west of Durham City. Palmer (1981, pp. 379-390) describes Brancepeth and neighbouring farms and cottages as part of a large agricultural estate which would have appeared a green oasis in an area of heavy industry. Within a radius of six miles of Sanderson's home were coal mines serviced by criss-crossing railways, coke ovens, iron-works, blast furnaces, steel rolling mills, associated engineering works, a paper mill and sawmills. There would have been

limestone crushers for the steelworks, and dirt, smoke and noise over all. Sanderson was educated in the Brancepeth village school until he was twelve. In 1870 he moved three miles to the village of Tudhoe to be first a monitor and then a student teacher in the National School. From January 1876 to the summer of 1882 Sanderson supported himself with scholarships. He graduated in December 1877 from Durham University with first class Honours in Mathematics and Physical Science. In 1878 he won an open Mathematics scholarship to Christ's College, Cambridge and in 1882 he completed the post-graduate Mathematical Tripos with Honours, in eleventh place. According to Walker (1956, p. 479) he continued in Cambridge

Taking private pupils and lecturing in Mathematics at Girton College. For five years he was appointed Examiner in Arts in the University of Durham; in addition to the Honours Mathematical papers, he had charge of the papers on the Greek Gospels, English History, Scripture History and Logic.

In May 1885 he was invited to Dulwich College, near London, as Assistant Master with responsibilities for Chemistry, Physics and Engineering.

13.3 Dulwich College, 1885-1891

Dulwich College was founded in 1619 in what is now a London suburb of that name. In 1883, according to Palmer (1977, p. 121.) there was some agitation for the school to follow the example of other public schools by installing workshops for boys with “a mechanical turn of mind”. Sanderson was appointed in May, 1885 on the high salary of £350 p.a. to devote his energies to the science and engineering sides. During 1886 a Chemistry master and a Physics master were appointed to assist him.

By October 1886, Sanderson, according to Walker (1956), had established a science side for boys seeking scholarships in Science at Oxford or Cambridge (“and within four years [his students] won thirteen open awards”). He established an Engineering side to encourage some to stay longer at school and to receive a good, general education. He extended the teaching of Chemistry and introduced Physics “to the whole of the Modern side and to the middle Forms of the Classical Side”. By then the school had workshops well equipped with “workbenches, lathes, tools, sinks, taps and a forge” with a further £200 granted for apparatus to assist physics teaching. (Walker, 1956, pp. 478-9)

Sanderson's principles at Dulwich included merging the teaching of physics and mechanics, letting boys learn manual skills by practice in workshops and

encouraging sceptical attitudes in the boys so that they would test and verify theory by their own experiments (Palmer, 1981, p. 124). Later in this chapter Sanderson's final lecture is summarised in which he listed the progress of his ideas at Oundle. In the lecture he refers to "an experiment ... I have unconsciously been trying for at least thirty years ... I began about thirty-six years ago (i.e. at Dulwich) to introduce applied science". Walker (1956, p. 479) cites a Dulwich old boy who recalled his impression of the beginning of that experiment as a student under Sanderson:

We had most orderly classes, everyone keyed up by his simple expositions of scientific facts ... He believed that Science could be made the base for true education ... he was developing his ideas of a broad curriculum of Education based on Scientific Method. ... What we learnt from him ... was a kind of fundamental belief in Scientific Method as a means of solving all the problems of life.

The Dulwich governors rewarded Sanderson for his contribution to the school curriculum and income - as by 1890 the engineering students who might otherwise have left school early were staying at school longer than other boys. Sanderson's salary was raised to £400 p.a., the highest of all staff. His achievements had not come easily. He had had to overcome initial resistance to his introduction of these modern, scientific ideas by those who had even opposed modern languages. In Walker's words "his beloved Engineering Laboratory was looked on as a rather vulgar excrescence, necessary, perhaps, but still deplorable" (1956, p. 479).

13.4 Oundle beginnings, 1892

Oundle School in Northamptonshire had an ancient mercantile tradition dating from 1556 when the Grocers' Company of London was required by a bequest to establish a school in Oundle Village. (Anonymous., 1923, p.12) In February, 1892, the Court (the Grocers' governing body) according to Walker (1956, p. 476) decided "to consider transforming Oundle into a Modern School" and appointed a committee to enquire into the matter. Hitherto Oundle had presented only a classical curriculum, with considerable success. The selection committee endorsed the idea of modernising the curriculum but did not envisage that the changes would lead students to universities. It proposed:

The system of teaching at Oundle School should be gradually modified so as to make it a school giving prominence to modern subjects, reserving advanced Classical subjects for those whose position or exceptional abilities fitted them for a career at a University.

In July, 1892, by a majority of one, the Court adopted the recommendation and selected Frederick Sanderson to lead the school into modern times – it was forty-five

years after Edmondson opened Queenwood College, his advanced science school which would provide “Youth with an education in harmony with the requirements of the age”. (Appendix to Chapter 9, N3.)

The committee of enquiry appointed by the Governors was aware Sanderson would face opposition to a major extension of curriculum and to the system by which housemasters made money housing boarders. (Palmer 1981, p. 52) Sanderson did indeed meet strong opposition, stronger than at Dulwich. It came from staff, conservative Oundle citizens, parents who felt a proprietary interest in the school, and some senior boys. Their objections were variously described by Wells (1923, pp. 18-19), Walker (1956, p. 480-1) and Palmer (1981, p. 51). The staff opposed him because he did not fit the accepted profile of a public school headmaster: his background and speech were working class and he had working-class sympathies. He had not attended a public school; he was not in Holy Orders (so his critics thought he should not be Chaplain) and in religion he was a modernist, favouring Biblical criticism). He was a Liberal in politics – perhaps worse he read Ruskin! He had no experience of running a boarding school. He was not a sportsman; he did not dress well; and worst of all, he was a man of science!

Sanderson in his first year organised the 92 students into four senior streams and a junior school. All 92 received mathematics teaching. There was no change to the classical side under Brereton, a brilliant classics teacher already at Oundle for twenty-five years. The four senior groupings in 1892 were Classical, Modern Languages, Science and Engineering to which Sanderson soon added music, history, agriculture and biology.

13.5 Personal relations

Sanderson suffered seven years before he had a staff complicit to his ideas. That he had the proverbial bluntness of a northern countryman and corresponding lack of tact, an ability to lose his temper and could not always clearly explain his ideas, did not ease this long period. By the end of the 1900-01 school year there were 150 students at Oundle. Then followed a continuous see-saw between the Grocers’ company attempts to restrain growth of the school to fit facilities and Sanderson’s efforts to enlarge the enrolment. In 1922, at the time of Sanderson’s death, there were 526 students and Sanderson was seeking 600. During the whole of Sanderson’s

tenure he was able to supply accommodation ahead of the Company limits by using his own funds to buy or lease properties and, later, sell them to the Company.

13.6 Curriculum and teaching

Sanderson believed in a student-centred education. In an article on ‘The teaching of natural science’ that he wrote in 1898, Sanderson argued that: “it is of the greatest importance in education to give attention to varying dispositions and to direct the education of a boy along the line of his own mental inclination and ability” (Palmer, 1981, p. 365). He recognised that a non-classical curriculum organised around laboratories and workshops widened students’ choices and, in practice, kept non-classical students at school longer. He saw that workshop practices encouraged teamwork, and he sought to extend team spirit to all school subjects. He envisaged a society where service rather than acquisition was the aim and where each person’s ability to create would flourish. In his sermons and scripture classes he encouraged his students to accept that vision.

Although not new, teaching on the basis of student interests was seldom applied in nineteenth century schools. At Oundle, Sanderson’s ideas rapidly expanded to embrace technology and science, the pure and applied, as the basis for all student activity, and not as pre-professional training. There was plenty to excite boys’ interests in technology. In his time, train companies vied for the fastest run from London to Edinburgh, shipping lines vied for the fastest passenger crossing of the Atlantic and flying machines were in the air.

13.6.1 Project-centred approach to all subjects

Sanderson described how a boy starting a new subject such as chemistry would spend his first term becoming familiar with the tools and nature of the subject and conducting experiments that interested him. (Anonymous, 1920, p. 60) The boy would call for, or himself seek theory, as necessary, to proceed. At any one time, a number of boys’ experiments would be in progress in the laboratory and each at various stages of completion. In this introductory term, the teacher would seek to convey what Sanderson referred to as “the romance of the subject” through stories and student reading: what had chemists contributed to the home, city, country and public health? What interesting or significant studies were in progress in industry and universities? Sanderson inspired his staff to follow this procedure which must have

seemed alarmingly innovative to those who, with Sanderson, had experienced in their school days “the cramping influence of traditional school science with its meticulous performance of elementary experiments, deeply venerated in the school” (Anonymous, 1923, p. 64).

In the second term (there were three terms a year) the boys determined their interest “sets” and the projects their groups would pursue. This process required much discussion between the boys and their subject teacher and it ensured that every boy was able to be involved in his work, each contributing in his own way to the group project.

If a boy followed a subject more suited to his taste and was engaged by that interest the result would be the gain, by the boy, of self-respect and confidence. In a sense, therefore, Sanderson was suggesting there was, in reality, no such person as a dull boy. (Palmer, 1981, p. 366)

Sanderson kept the laboratories and workshops open so that the boys could pursue their projects in their own time, a practicable procedure for a boarding school but one that put tremendous faith in the boys’ ability and common sense. While several ‘presumes’ have to be made to visualise the Oundle curriculum in action there is no doubt about the high quality of the outcomes of the Oundle procedures supported by the extensive and well-equipped laboratories and workshops illustrated in Chapter 13.9, following.

13.6.2 Engineering

By 1913 the heart of Sanderson’s teaching was the “Engineering Laboratory”. Not to be thought of as similar to a traditional chemistry or physics laboratory, Walker (1956, p. 530) explained the term embraced

The wooden shed which contained engines, dynamos, motors, turbines and other machines, together with various tools and commercial testing plants [and that] the whole teaching of Mathematics and Mechanical Science turned upon the proper use of such a room and of the appliances contained in it.

The engineering laboratory was, first, to serve Sanderson’s cultural approach to applied science (and all other subjects in the curriculum) by leading the boys to appreciate the value of stating a problem, the research to identify appropriate procedures to solve it and teamwork to achieve the objective so defined. Further, as in the case of mathematics, the procedure showed a boy the practical value of subjects allied to engineering. For example, in 1913, Sanderson wrote:

The object of the new method is to give the boy the opportunity of acquiring a body of practical information, and of gaining the capacity for making use of his knowledge. In carrying out this method an attempt is made to look upon a class as a staff of workmen actually engaged in some “live” work. In this way Mathematics will come in incidentally, and be learnt as need arises. The boy will learn his Mathematics by using them, in much the same way as he learns to walk.

... This is the natural method of a good workshop. ... Later he can be taught formal Mathematics. (Walker, 1956, p. 530)

Oundle's engineering side was important for future engineers and the professional value of its course which other schools might have stated as a prime objective (along with a higher financial return from keeping some boys at school longer than otherwise) was served, in addition to scientific acculturation. Walker (1956, p. 549) cited Sanderson:

It is not intended to do away with the necessity for a subsequent professional pupillage, but rather to place boys in a position to make more intelligent progress during the pupillage, and thus diminish the time and expenses for such pupillage.

The argument that trade courses in schools benefited employers was not new. Quaker schools early in the century and schools of industry generally knew that if they provided trade training they increased their students' chances of employment, and reduced the amount the parents would pay to secure apprenticeships for their children. Hill (1836, p. 20) described in 1835 an employer waiting list for children completing their education in an industrial elementary school which specialised in training for the printing trade.

The memorial volume (Anonymous, 1923, pp. 88-90) describes Sanderson's approach to teaching Mechanics in his earlier days at Oundle.

Rather than taking a succession of examples on one principle, he preferred to take a real machine and spend a whole lesson on the various problems arising, for example, from the movement of a train – the horse-power required on the level, up a hill, the acceleration, the power developed in the cylinders, and so on.

He delighted to give little boys real apparatus to play with. He put boys of eleven to study a big lifting tackle "to see how many times stronger it makes you" (p. 90).

13.6.3 Biology and Agriculture

Up to 1912 special arrangements were made to teach Biology to students who required the subject. In 1912, with new buildings, equipment and farm land available, it became an important department of Oundle, supported with great enthusiasm by Sanderson to whom the subject was new. Provision was made for all boys to include some Biology in their courses. Sanderson wanted everything in abundance. He wanted his department to resemble "young Zoological Gardens, a thumb-nail Kew, or a small Rothamsted [an Agricultural Research Station]" (Anonymous, 1923, p. 135). Oundle activities, which continued through the Great War, included soil analysis of the school five-acre farm, rapidly extended with a

further thirty acres, field trials of wheat varieties carried through to appraisals of their respective bread qualities, botanical gardens in which classic experiments such as Mendel's could be reproduced. Within the department buildings were:

aquaria and vivaria, large and specially designed incubators for all purposes [...] charts were shown explaining the progress of biological thought.[...] A well-equipped photographic room [including] photomicrographic apparatus. [...] and after one or two years rock plants, plants of pond, marsh, and sea-shore, climbing plants, fernery, rose garden, and a large herbaceous border made their appearance. (Anonymous, 1923, pp. 135-6)

In Sanderson's words "Real live education – boys marched up to the frontiers of the unknown – to go into the world as pioneers – Darwins, Listers" (p. 137).

13.6.4 Teaching History

Behind Sanderson's method of teaching history was his grand vision: that the school would gradually develop and display illustrations in some form or other of "The Rise of Man": from the first organisms displaying consciousness into "the most modern form of collective self-consciousness" (1923, p. 113). As with the other Headmasters described and discussed in this study who were impelled to develop curricula empathetic to their grand designs, it was the practice in their schools, as experienced and accepted by their students, on which their schools might be judged. Sanderson made space in the Oundle library for class work - the laboratory for history and the social sciences. His pedagogic aim was to ensure that his school leavers would be able to approach history as might be expected of undergraduates: through critical examination of a variety of sources.

As with the beginners' introduction to Chemistry described above, the task for senior students starting history was learn to read and understand "books, documents and maps" within the literature they would be expected to examine in their second term (Anonymous, 1923, p. 115). The "general idea" would be explained to them of the approach that would be followed in the second term, namely that the form would divide itself into sections to correspond respectively to each part of the project. Within each section there should be groups of two or three boys who would work together to explore a sub-section of the study. Collectively, the form would assemble the work of all the sub-sections to arrive at a comprehensive report.

In the example cited in the 1924 Memorial volume there were six sub-sections from "Before the French Revolution" to "Modern Problems: their Evolution, 1783-1905". The boys were introduced to the sections of the library and their volumes which

corresponded to each task and provided with a complete list of the library books. In his first term, each boy read individually at least three relevant books; each selected one section of a book for further study. The notes given to the boys indicated that “For examination purposes, the scheme lends itself to research work and thesis-writing by individual boys” (Anonymous, 1923, p. 123).

It is not clear from the text but it seems likely that Sanderson secured support from the Oxford and Cambridge Examinations Board for the subject of “Library Work” which was introduced to the School Leaving examinations in 1920. Six of eight Oundle students gained passes in the first external examination of the subject.

13.7 Oundle results

To think of Oundle is to think of Applied Science conducted in workshops and through engineering projects, of large-scale practice of Biology and Agricultural Science and, overall, wholehearted endorsement of scientific thinking in every subject. In terms of publicity, these were the new and exciting aspects of the school development. Part of Sanderson’s initial contract in 1892 was that Oundle’s Classics side should continue to be supported. Walker showed that over Sanderson’s thirty years the boys’ gained high university awards in both science and non-science groups of subjects.

There were thirty-nine scholarships and fifteen exhibitions in Classics, and one in History: there were thirty scholarships and twenty-one exhibitions in Natural Science, with seven scholarships and two exhibitions in Mathematics, seven scholarships and one exhibition in Biology, and one exhibition in Geology. Thus fifty-four (or fifty-five with the History) were gained by boys on the Classical Side and sixty-nine by boys on the Science Side. (Walker, 1956, pp. 548-9)

13.8 Armstrong’s disagreement with Sanderson

Sanderson’s methods of teaching differed from that of other schools equipped with laboratories. Laboratories to Sanderson were not for formal teaching. They were for student learning through experimentation; for uncovering problems for resolving which might require formal explanations in a classroom. But such an approach was fluid. Hard and fast methods, such as following a textbook, were rejected. It would be reasonable to say his methods were ‘heuristic’ had H. E. Armstrong’s name not come to be associated with that term.

In 1924, Henry E. Armstrong (1848-1937), an eminent chemist whose name in education is associated with the *heuristic* method of learning science, sharply criticised Sanderson's work for lacking knowledge of scientific practice. In a talk to the Reading and District Teachers' Association in September 1924, cited by Brock (1973, pp. 133-147), Armstrong said: (p. 139):

Sanderson was nothing short of inconsequent in his ravings – they were nothing less – on science. At the back of his head he had ideas which were sound in every way but he knew too little of scientific practice to be logical and was often inconsequent. (Brock, 1973, p. 139)

As an example of Sanderson's "ravings" Armstrong cited a passage in a speech by Sanderson (Anonymous. 1923, p. 257):

It is more important at the present day to revive the demonstration methods which Huxley and Tyndall had in view. The Romance of Science we may call it; and it is a romance which brings inspiration. [...] The Romance of Science opens out ideals, the wondrous experiments stir up faith and belief.

Armstrong was unfair in the above attack. At the ellipsis in the third line of his quotation from Sanderson's speech he omitted eight lines in which Sanderson discussed the importance of inspiration *and* precise practice. Sanderson was saying that schoolboys could find practical experiments dull unless stimulated by the Romance of Science; that "the first duty of the Science Master is to inspire his boys with the love of Science" (Anonymous., 1923, p. 256). Armstrong's remarks suggested he wanted students' time in school to be concentrated on training; non on the history and applications of science.

Palmer wrote: "Armstrong considered Sanderson a dreamer and idealist imbued with a strange mixture of the missionary, the engineer and the scientific amateur". And as Armstrong regarded engineers as "more interested in using facts than in finding them" it was as an engineer that Armstrong judged Sanderson. "Armstrong admired the courage of Sanderson's experiments in education" but "saw the weakness of Sanderson's methods. For Armstrong, the teaching of science meant method, measurement and hard discipline rather than romance" (Palmer, 1981, p. 436). Armstrong referred to "several Cambridge professors" who found students from Oundle were undisciplined in method and logic (Palmer, 191, p. 4). "In defence", wrote Palmer, "Sanderson countered that without his methods and without romance to attract them, many of his boys would never have developed any academic enthusiasm". In his talk to the Reading teachers, Armstrong referred his audience to

the rules for experiment in his 1903 publication, *The Teaching of the Scientific Method* where Armstrong states the crux of his method:

Heuristic methods of teaching are methods which involve our placing students as far as possible in the attitude of the discoverer – methods which involve their finding out instead of being merely told about things. (Armstrong, 1903, p. 236)

However, the various science syllabuses cited by Armstrong in his book as serving the cause of heurism left little room for the student to be placed “in the attitude of the discoverer”, let alone be given the opportunity to make any discoveries in subjects of his own choosing. Various examples presented by Armstrong (pp. 291-335) such as the syllabuses for elementary Botany, Vegetable Physiology, Physical Science and Chemistry developed by a British Association Committee of which Armstrong was a member, consist of directions for laboratory work to illustrate established methods. There was no suggestion that the students themselves should propose any problems, though the syllabus statements encouraged students to think about methods of conducting the prescribed experiments.

13.9 Co-operation rather than competition

Before 1900, an active Oundle Science Club was responsible for displays and mini-talks to parents on the annual Open Day. The students worked in small teams to assemble their exhibits and explain their theory. Their enthusiasm was high. Wells (1924, p. 144) refers to “[t]he total number often exceeding 200 senior boys taking part” which on school numbers would not have been possible until the school year, 1904-5. However, the Open Day program included at the end of the chapter appears of a later date, perhaps 1920 or 1921. The topics listed indicated that the students had a high level of scientific knowledge. They included X-rays, methods of tracking atomic particles, colours produced by passing an electric current through gases at low pressure, polarisation of light, identification of elements through spectroscopy, electromagnetism, wireless telegraphy, amplification of telephonic currents, steam engines, turbines, engines for aeroplanes, a wide range of chemical experiments, electroplating, manufacturing chemicals, experiments and exhibits in biology and agriculture, displays in the school museum, botanical garden and the experimental farm.



Fig. 13.1 The new science block in 1914 –
from a post card by Alfred King & Son,
Oundle (Courtesy Oundle School)

Figure 13.1 *The new science block 1914-from a post card by Alfred King & Son
Oundle (Courtesy Oundle School)*

The students had facilities advanced for their time as indicated by the photographs on this page.

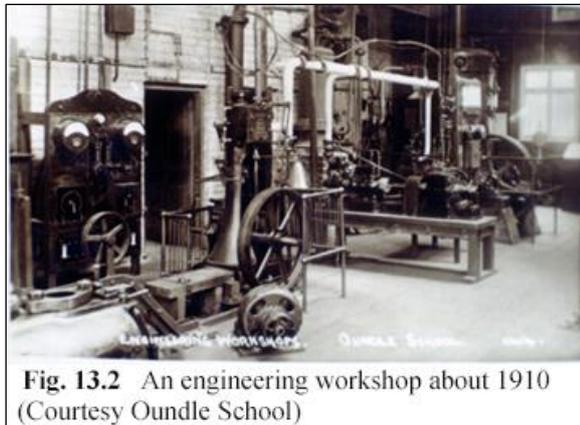


Fig. 13.2 An engineering workshop about 1910
(Courtesy Oundle School)

Figure 13.2 *An engineering workshop about 1910 (Courtesy Oundle School)*



Fig. 13.3 The Physics Laboratory about 1910 – from post card by HH Markham (Courtesy Oundle School)

Figure 13.3 The Physics Laboratory about 1910 - from post card by HH Markham (Courtesy Oundle School)

Whether team work was used in classrooms before Open Days began is not clear. Certainly, Sanderson made team work a standard practice not only in the engineering department but as far as possible in all subjects. On 15 June, 1922, in his speech to the Association of Scientific Workers, he described how his ideas had developed about the place of team work in the daily activities of the school. First he introduced “engineering – applied science” which attracted boys “who could not do other things”. They began to like their work in school.

Then he introduced other sciences, such as agricultural and metallurgical chemistry, bio-chemistry and agriculture and these in turn interested more boys.

Then, Sanderson said,

“I ventured to do something daring ... to introduce the scientific method.”

“Then I gradually replaced conventional classroom teaching with team projects the members for which were selected according to boys’ skills and interests.”

Team members were not restricted to boys from one class.

Team projects were conducted in science and technology, and also in literature, modern languages and music and the idea even spread to the Classics department.

This change to “research team work”, said Sanderson, “brought about a profound change in learning and enthusiasm”. It changed boys’ attitudes to their positions in class and astonishingly the team organisation kept each boy involved. (Wells, 1924, pp. 137-9)

13.10 Laboratories for all subjects

Team research work also changed the concept of a 19th century classroom. The research teams required space to move and the right to talk. Architecture must accommodate fluidity. Sanderson wrote:

The application of the scientific method to literature, art, history, will require what may be called literary workshops ... There will be fewer class-rooms, for the class-room is competitive and dominant, and represents the knowledge of things that are, rather than the search of things yet to be. (Anonymous, 1923, p. 305)

Sanderson did not develop his school buildings to meet the needs he recognised for team work other than providing space in the library. The war of 1914 intervened. The school accepted engineering and wood-working sub-contracts for the military and the boys worked four-hour shifts to fulfil them.

It is interesting to conjecture how Sanderson might have redesigned his school to give primacy to research teams' needs. With what administrative unit might he have replaced "the form", that device through which inequalities are often preserved as students of more or less similar ability march platoon-like, year to year?

13.11 Sanderson's preaching and inspiration

"Sanderson", wrote Palmer (1981, p. 181), "was a deeply religious man throughout his life". He appeared to have taken little formal religious training during his student time at Durham or Cambridge Universities, though Palmer explains that to matriculate for Durham he had had to pass "an examination in the rudiments of the Christian religion" and as a student there for honours in mathematics he had been obliged "to study certain aspects of theology". Initially, too, he had won a one-year scholarship for students "desirous of becoming students in theology", but Palmer implies he may not have given the subject much attention. At Oundle, Sanderson acted as School Chaplain conducting school services and Sixth form Sunday Scripture lessons. Palmer was able to obtain 179 of Sanderson's sermons that had not previously been available which, together with twelve published in "*Sanderson of Oundle*" (1923), allowed him 191 for analysis. This was still, perhaps, a small proportion of the total prepared by Sanderson over his thirty years at Oundle. Palmer was able to classify the sermons into three periods: 1892-1913, 1914-1918 and 1919-1922. One theme was constant over the thirty years: that a man with high ideals will face adversity, but his experiences will strengthen and support him to continue his

quest. The quest will become nobler; it will include the ideal of service to higher purpose.

In the earlier period, 1892-1913, Sanderson frequently spoke about the morality of work; its relationship to self and community. Work should be undertaken for its value to self; not in anticipation of pleasures from its completion. Work within the school was to contribute to the successful life of the school. Work on leaving school should be related to the purpose of the community. It could involve personal sacrifice. The process, Palmer (1981, p. 194) summed up as: "Hence, the great work of life should be to strive for the perfection of self".

The 1914-19 war shocked Sanderson, as with so many others, with its long lists of casualties especially high among those from the school's Officer Training Corps, and the loss of his elder son towards the end of the war. How should or could a Headmaster preach in such times? Sanderson extended his preaching on the Kingdom of God within to visualising the new Kingdom of God to be achieved after the war, and the part that Oundle Boys could play in bringing it about. Palmer (1981, p. 203) wrote: "He felt the sacrifices made in war should not be wasted since they had been made in order to bring new life with new codes of justice and of sacrifice itself". It would be the task of schools to develop their students to undertake the task of transforming society. Sanderson took this message from the circumstances of school Sunday orations to the public area. Unlike pre-war, he readily accepted invitations to lecture and his messages could have upset those with conventional views about the importance of public school training.

Any of the captains of Midlands industry whose sons were at Oundle could have been uneasy by Sanderson's stance against the profit motive as the correct purpose for British industry. In a speech on 16 February, 1920 Sanderson called for radical change:

The new leaders should realize that the first product of industry must be the workers themselves – an old enough conception, but the time is coming when for industrial equilibrium and for output it will be necessary to make this product the first condition of industrial management (Sanderson, 1920, p. 2).

In a Luncheon Club address Sanderson refers to inspiration from John Ruskin and Palmer (1981, pp. 365-379) shows the influence on Sanderson of Ruskin's writings and those of other socialists at the turn of the century.

William Morris, Walt Whitman – penetrated his sermons and strongly influenced his ideas of a future society. Applied science, as instanced in Sanderson’s education ideas carried its own mystique for him. It called for co-operation, good management supported by team work and testing of ideas as well as materials.

Palmer added:

Sanderson looked for support for his teachings to the work of Dante, Milton and Bunyan, together with the scientific accomplishments, faith and belief in God of men of the calibre of Newton and, in particular, Faraday. It is clear, too, that his great knowledge of the Bible [...] assisted him to impart to the boys the spirit and attitude to life he expected them to develop. (p. 378)

Palmer, in his analysis of Sanderson’s 191 available sermons, attempts no theological commentary, rather he looks for the messages Sanderson was giving to his schoolboys.

Palmer (1981, p. 200) notes that up to 1904 Sanderson presented the Bible “as the end of knowledge; the knowledge to which all other forms of knowledge converged. To acquire the love of its study was ... the greatest gift the school could give to each boy”. He cites a 1921 sermon in which Sanderson interprets John 4.7: “I came that ye might have life and that ye might have it more abundantly” as stressing the ethical values that one’s life should exhibit and thus confer a richer life on an individual (p. 213). By that year, Wells (1924, p. 79) was worried that Sanderson’s theological views had so far departed from orthodox Christianity that within a year or two they would provoke a crisis with the School Governors. Arising from discussions with the father of an Oundle boy killed during the war about a suitable memorial, Sanderson developed ideas for a fine creation, though impracticable for the times, as the Yarrow Memorial. It was to be a continually changing memorial to man’s creativity through the ages, especially scientific and technological; a place in which the boys could gain daily inspiration to join the process of creativity.

13.12 Notes to Chapter 13

Note 1: H. G. Well’s association with Oundle books

H. G. Wells was a close friend to Frederick Sanderson and had two sons at Oundle at the time of Sanderson’s death. There were immediate plans for a memorial volume and memories were collected from present and former staff and students. Wells planned to include a record compiled by two students (one, his son) of a Sunday afternoon talk to the school by Sanderson. The record was replete with Sanderson’s admonitions to boys misbehaving. The effect was derogatory to Sanderson. Mrs Sanderson refused to allow Wells to include it. Wells would not agree to its exclusion and resigned as editor and declined to be associated with the publication. Hence the volume titled *Sanderson of Oundle* appears as by “Anonymous” Wells then wrote and published his own tribute in 1924 with the title, *The Story of a Great School Master being a plain account of the life and ideas of Sanderson of Oundle*.

Note 2: An Oundle School Open Day

The sophistication of the science and engineering equipment at Oundle and the ability of the students to present it are illustrated by the following extract from an Open Day program, possibly about 1920.

Note 2.1: Experiments and exhibits in Physics in the Standardising Laboratory

Room A: High voltage experiments

Induction coil

Tesla cell

X-rays

Room B: Radium experiments

Cloud apparatus showing expulsion of helium atoms from radium

Electric discharges through rarefied gases

Room C:

Projection polariscope

Accurate spectroscopy

Quartz spectrograph

Constant deviation wave-length spectrometer

Absorption spectra

Colours of thin films

The phoneidoscope

Bending of a thin beam Ripples

Room D: In the machinery hall

The mirage

Singing flames

Rijke's sounding tube

Electromagnetism

Prof. E. Thomson's repulsion coil

Dorman engine

The Wimshurst machine

Coupled vibrations in mechanics

Strength of materials:

1½- ton testing machine

5-ton testing machine

Ewing's extensometer

Brunel hardness tester

'Water hammer'

Cartesian diver

Pepper's ghost

Optical illusions and other experiments Continuous wave (C.W.) wireless telegraphy

Long-wave receiving set

Resistance amplifier of high-frequency oscillatory currents

Amplification of telephonic currents

Lodge's resonant jars

Hertz experiments for production of electrical waves

Wireless telegraph sets

Mobile field station spark sets

The Duddell singing arc

Three-electrode valve giving

oscillations of musical frequency

Engines

Horizontal steam engine

De Laval steam turbine

30-h.p. gas engine for gas or petrol

90-h.p. Curtiss aero engine

Anzani 3-cylinder radial engine

(Bleriot's 1909 Channel flight was powered by a similar engine.)

Japanese 2-cylinder engine

Note 2.2 Exhibits and experiments in Chemistry in the chemical laboratories, lecture room and the Old Forge

The concentration of minerals and coal by froth flotation	Invisible ink
Experiments with liquid air	Gas analysis
Manufacture of coal-gas and its by-products	Hempel's apparatus
Distillation of coal-tar	The Orsatt apparatus
'Working up' the coal-tar products	The silica garden
Coal-gas stripping plant	Manufacture of nitric acid
Pigments	Flame test and borax beads
Preparation of other organic bodies	Fixation of nitrogen
The Diazotype photographic printing process	The Le Blanc manufacture of sodium carbonate
Mercuric thiocyanate – 'Pharoah's serpents'	The making and manipulation of glass
Illustration of the manufacture of alcohol from starch	The distillation of wood
The etching of glass	Smelting of ores
Electrolysis and electroplating	Emergency cupola furnace
Diffusion apparatus	Cupellation of silver
Deposition of silver on glass	Manufacture of metallic calcium
Determination of molecular weights	Manufacture of caustic sod
Manufacture of soap	Manufacture of bicarbonate of soda
Manufacture of sulphuric acid	

There were other exhibits in Geology, Biology and Agriculture and in the School Museum, Botanical Garden and on the Experimental Farm.

Note 3: Increased demand for science graduates during Sanderson's time

In the 1880s and up to and probably including the First World War, there was a considerable increase in jobs for science graduates. Sanderson's own career illustrated a trend by secondary "public" schools to modernise their curricula by introducing science subjects and building laboratories. During 1870-95 sixty-seven central schools were developed in the northern industrial cities which offered one or more science subjects and would have required proficient science teachers. (Refer to Ch12, §6) Although their ambitious programs were cut back in 1904 (Refer to Ch12, §7) when the Government introduced a secondary school system, the effect of the 1870 compulsory school attendance trebled the number in elementary schools and so increased the potential number that would seek post-elementary education in science. In addition, British industry was discovering the value of science workers. James Donnelly speculated that in the 1880s there were about 2,000 industrial chemists

employed in British industry and that by early in the twentieth century the number had increased to about 3,500. (Donnelly, 1996, p. 781) The additional demand from industry had no significant effect on the science training provided by universities and technical colleges as analytical chemistry which had served medicine and dentistry, also served the expanding industry needs for quality controls on raw materials and factory production lines.

13.13 Summary Chapter 13

Sanderson's organisation of Oundle's senior school curriculum at the turn of the century encompassed his methods of encouraging students to engage with science and technology; replacing competition with co-operation as the basis of student work and the idea of laboratories for all subjects. Specifically, he argued for;

- A wide range of subjects offering much choice to be available. No student should undertake a subject in which his interest was not aroused.
- Learning in any subject should take place in research teams, the members of which should have a common interest in a project. They could be recruited from various classes and have various levels of skill.
- Enquiry and practice should come before application of theory.
- Classroom design should change to allow adequate space for research teams not working in laboratories or workshops, to discuss and assemble their projects.
- A large central library should be the hub of the school.
- Subject content should dwell less on wars, heroes and monarchies; more on the common man and his living conditions. For example, Latin students in their projects could research the engineering of Roman cities rather than Roman Wars
- The students should be enthused with the joy of creation and seek a daily re-creation of the spirit.
- Society should change to a basis of co-operation and place man, not profit, at its centre

Chapter 14

THE FIVE HEADMASTERS' CONTRIBUTION TO EDUCATION

... thinking *about* history suggests the study of an objectified past which is dead and gone, thinking *with* history means using the past as an aid to understanding the present.

*John Tosh, Professor of History at Roehampton University in a
Public Lecture at University of Melbourne, May, 2006. (Tosh, 2006)*

The five headmasters were selected for their known association with nineteenth century schools that taught science or scientific method. In this chapter, based on the details in the preceding chapters, I explain who these men were and describe and analyse their biographies before they became school men identified with progressive educational reform that included the teaching of Science. Further, I have analysed their visions and examined the results of their efforts. Discussions of these issues are provided as follows in response to the seven research questions identified in Chapter 1 as well as to one research question that emerged from the analysis of the preceding chapters:

Early life experiences: Response to Research Question 1. What were their early life experiences and visions for schools?

School visions, sources of ideas and relationships: Response to Research Question 2 What were the sources of their educational ideas and their work relationships?

Engaging student interest: Response to Research Question 3. How did they engage students to be interested in schooling?

Subjects without borders: Response to Research Question 4. How and why did

Experimental methods: Response to Research Question 5. How did they bring science into the school curriculum?

Student self-learning and application: Response to Research Question 6. What opportunities did they provide for student self-learning and application?

School engagement with society: Response to Research Question 7. How and in what ways did their schools engage with society?

Opposition to headmasters' practices: Response to Research Question 8. What was the opposition to the headmasters' practices?

14.1. Early life experiences: Response to Research Question 1. What were their early life experiences and visions for schools?

The five headmasters were most similar in what they were not! They were not upper-class in origin; had not attended one of the great public schools and had followed no easy path to gain their education. Worse, in Sanderson's case as Headmaster of a "Public School", he did not play cricket! They were similar in dreaming large and adjusting their teaching to their times and circumstances.

Robert Owen (1771-1858) was born in the Welsh market town of Newtown, a centre for a cottage woollen industry. His father was a saddler, ironmonger and local postmaster. His mother was a farmer's daughter. Owen was an early reader, became a monitor in the village school and worked part-time in a local draper's shop. At age ten he resolved to become self-supporting and persuaded his parents to send him to his elder brother's care in London. There followed what appeared to be nine planned years of excellent practical training in the retailing of high-class fabrics and low-priced garments, textile importing, and operating cotton-spinning machinery. In his first apprenticeship he had the opportunity to read widely and learn bookkeeping. By 1800 when he became Managing Partner of the New Lanark Mill complex Owen was an accomplished manager of mill workers and their machines. He could learn by studying and talking to workers, and his belief that a bad society was responsible for people's bad behaviour supported his sympathy for transgressors. He did not discharge workers for drunkenness; instead, he limited the alcohol that could be bought with a company credit card. He limited thieving of factory goods by tightening inventory control. In short, he changed the environment for transgressors; he avoided making them local heroes,

Richard Dawes (1793-1867) was a son of James and Isabella Dawes, of Hawes, in the North Riding of Yorkshire. His father was a farmer who owned his own property. Dawes was educated at Ravenstonedale Grammar and coached in Mathematics for Cambridge University entry by the blind polymath, John Gough. He won entry to Cambridge as a financially assisted student, followed the Mathematical Tripos course and gained his M.A. in 1817 with high honours ("Fourth Wrangler"). He was elected

a Fellow of Downing College and successfully held the positions there of Bursar and Mathematics Tutor for seventeen years until he accepted the “living” of the small Parish of King’s Somborne in Hampshire, becoming its Rector in 1837. He planned an elementary school for the Parish which was opened in 1842 and was associated with the *National Society for Promoting the Education of the Poor on the Principles of the Established Church throughout England and Wales*. Dawes was scathing in his opinion of the National Schools’ standard.

With respect to the standard of acquirements to be had at most of our National Schools, all seem to agree that it is far below what it ought to be, and that this is the case, no one of any experience can doubt. (Dawes, Hints, p. 5)

Not exactly the most politic of statements to make when bringing a new school into the National Schools Association!

Dawes developed an educational vision that encompassed:

- A system of schools for which capital costs would be subsidised by the Government or private philanthropy and operating costs would be covered by student fees. Care would be taken to avoid the poor from feeling stigmatized by receiving “charity”.
- Schools needed to provide high standard education that “bearing upon the wants of both” employer and worker would be attractive and feasible for each to attend.
- Schools should cover their operating costs from each according to their means. Farmers and tradesmen should pay higher fees than farm workers for their children to attend these schools; those sending children from outside the Parish should pay a further fee
- The rural school should ensure its attraction to farmers by teaching agricultural science
- King’s Somborne could become the model school, training teachers for other schools to become part of the system
- The system would put out of business private schools now attended by farmers’ children which charged relatively high fees for an inadequate education, thus providing a further benefit to the employers. (Dawes, Hints, pp.6-10)

Dawes considered the benefits of his system would extend beyond those that would be achieved by future employers and future employees attending school together; it would allow moral values to be inculcated into the children, viz:

That the wages of the industrious labourer, in a healthy society, ought to be equal to all the decent wants and responsibilities of his station in life; and although political economy may say the state of the labour market is not regulated by considerations of this kind, yet, youth trained up in these ideas [...] will not, afterwards, be able to shake them off. (Dawes, Hints, p. 11)

George Edmondson (1798-1867) was born into a poor Quaker family operating what appeared to be a small ship-chandler's business in the riverside area of Lancaster town, in Lancashire. Edmondson attended a local Quaker elementary school. During 1811-13 he was subsidised by the District Quaker organisation and local Friends to attend the Yorkshire Quaker College of Ackworth, constituted for children of Quaker families "not in affluence." After two Spartan years extending his knowledge of spelling, reading, arithmetic and learning something of keeping household accounts Edmondson gained an apprenticeship with one of the Ackworth masters who had opened his own boarding school at Hallam, near Sheffield. Singleton to whom Edmondson was apprenticed, Singleton's family (which included Anne Singleton, who became wife to George) and Daniel Wheeler were all members of the Hallam Quaker Meeting. Wheeler, a former military man who had converted to pacifism and Quaker membership, was endorsed by the British Quaker movement to lead a Quaker working party to Russia, requested by Alexander, Russian Crown Prince. After five years in which he directed 200 serfs working near St Petersburg on one part of the Czar's land reclamation scheme and tutoring Wheeler's children in the winters, Edmondson returned to Lancashire with his wife and young daughter, and started school teaching in 1825. His successive schools flourished. In 1838, at his school at Lower Bank, near Blackburn, he reported to the Friends Education Society that he had installed "a printing press, a lithographic press, a turning lathe, a workshop containing tools and a carpenter's bench." Edmondson had some lectures on Chemistry given to his students in Blackburn and to those in his larger and boarding school in Preston, also in Lancashire, to which he moved in 1841. The subjects available to his Preston students now included surveying, with instruments, bookkeeping, advanced arithmetic and algebra. By 1844, Edmondson himself was giving Chemistry lessons and some boys were buying their own apparatus. (Russell, 1986) These forays into Chemistry and tradesmen's skills were in accord with Quaker practice and belief; a practice which helped young Quakers get jobs and was

in line with beliefs outlined by as early as the seventeenth century by Quaker writers who encouraged both boys and girls to be as highly educated as possible “in that they might help others”(p. 152).

Edmondson became increasingly enthusiastic about teaching science and mathematics as essentials of “a modern education.” In his 1847 introductory press advertisement for his new Queenwood College he devoted seventeen of the twenty lines describing the College syllabus to science and other practical subjects. And in the first copy of the school paper, *The Queenwood Reporter*, for 1848 appeared this Editor’s note:

One leading object at Queenwood [...] our pupils’ progress will be tested by their ability, and not by their amount of knowledge. So far as possible, everything will be taught and learned among us, practically, that is with a view to the business of life. (*The Queenwood Reporter*, February 15, 1848)

In a Supplement to the same issue of *The Queenwood Reporter*, Edmondson published a letter to the agriculture students in which he indicated his appreciation of the role of science in agriculture and its function “for the well-being of man, as an individual and as a member of society.” Over the years, science applied to farming had improved the fertility of the soil, the efficiency of implements and changed farmers’ produce from that of the means of subsistence to a marketable excess. It had reduced the hours a farmer worked and allowed him more time for spiritual exercise.

Charles Howson Willmore (1832-1902) became Queenwood’s second headmaster on first of January, 1864. His initial school prospectus indicated he would follow in Edmondson’s footsteps, a position he maintained during his thirty-two years in control. For example, in his School Prospectus, possibly published for the beginning of the 1892-93 school year (it contains parent testimonials with dates up to 2nd July, 1892), he wrote:

For nearly fifty years Queenwood College has had its own special characteristics as an educational establishment. From the first, breaking with the traditional scholastic course, it framed for itself a curriculum which should be in accordance with the real requirements of the day, and to this it has adhered ...

Indirect evidence suggests Willmore relinquished his ownership of a school in Wilmslow, Cheshire after he bought Queenwood from Mrs. Edmondson, presumed executor of her late husband’s estate. His interest in Chemistry was apparent as he brought with him a Chemistry student, John Hopkinson, who later became a

distinguished Ph.D., FRS and a brilliant electrical engineer. Willmore was also a member of the British Association for the Advancement of Science. Unlike Edmondson Willmore was no Sabbatarian. Sundays became more enjoyable for the students as after Sunday Services at school, they walked the surrounding countryside. Willmore's tenderness for younger students was exemplified in providing a pony and cart on which they could take rests during the walks. Early issues under his headmastership of *The Queenwood Reporter* showed his ability to appreciate student interests and fun. He reported prices of rare birds' eggs at London auctions and recounted the bright summer evening when the boys played football by moonlight.

Frederick Sanderson (1857-1922) was born to working-class parents on a large agricultural estate that embraced several farms. The estate was an oasis in an area of heavy industry and servicing rail networks near Durham. Sanderson attended a village school. At age twelve, he became a monitor and then an assistant teacher at a National School in a nearby village. He won a year's theological scholarship to Durham University and from then to the summer of 1882, Sanderson supported himself with scholarships. He graduated in December 1877 from Durham University with first class Honours in Mathematics and Physical Science. In 1878 he won an open Mathematics scholarship to Christ's College, Cambridge and in 1882 he completed the post-graduate Tripos with Honours, in eleventh place. According to Walker (1956, p. 479) he continued in Cambridge taking private pupils and lecturing in Mathematics at Girton College. For five years he was Examiner in Arts in the University of Durham; in addition to the Honours Mathematical papers, he had charge of the papers on the Greek Gospels, English History, Scripture History and Logic.

In May 1885 Sanderson was invited to Dulwich College, near London, as Assistant Master with responsibility for Chemistry, Physics and Engineering. In 1892, the Governors of Oundle School, which had a long history of Classics teaching, decided by one vote to introduce modern subjects and selected Sanderson to do so – provided he did not change the Classics side which, at the time, was particularly successful. Sanderson did not bring to his task big ideas for the reform of a capitalist society like Owen, or its substantial improvement like Dawes or for a scientific society bringing employment opportunities for the individual like Edmondson. He instituted

fundamental pedagogical restructuring based on project-based learning in all subjects other than the classics. But, even in that department of the school, his methods were tested.

By analogy with the teamwork involved in building a machine, Sanderson changed the basis of schoolwork from competition to co-operation. Just as construction of a machine required people of various skills and abilities, school work could be tackled by students working in teams and drawn from different school classes. In selecting the parts they would play in the project, students could build on their interests. To meet examination needs, projects could be designed so that team members' work could be assessed individually.

Application of Sanderson's decision called for a change in school architecture and reconsideration of the function of a classroom. For example, Sanderson regarded the library as the laboratory for history and the social sciences. Thus he made space in the library for team work. His aim was to ensure that his school leavers would be able to approach history as might be expected of undergraduates: through critical examination of a variety of sources.

14.2 School visions, sources of ideas and relationships: Response to Research Question 2. What were the sources of their educational ideas and their work relationships?

How did the headmasters characterize new social orders of their time to position their progressive educational practices and agendas? To what educational principles was science education attached? Distinguishing principles from activities, it is reasonable to say that in the church-attending nineteenth-century their principles were those of New Testament Christians in that their attitude to children exemplified "Love thy neighbour," "Forgive their trespasses," At an early age Robert Owen (1771-1858) assembled his principles through anti-clericalism. He thought all churches ascribed freedom of will to people whereas, in his *Essays One to Four* published 1812-14, he argued that society imposed patterns of behaviour on people, and society was to be blamed for people's transgressions. Whereas persons trained in science and technology, saw their teaching programs as experimental rather than established to instil traditional virtues; offering different versions of knowledge useful in the working lives of the students. In the last decade of the eighteenth century Owen, by a

mixture of bravado and demonstrated expertise, became Manager of Manchester cotton spinning factory and, successively, a partner in the Chorlton Twist Company, near Manchester. He then had the leisure to learn about social conditions and ideas for reform at the Manchester Literary and Philosophical Society, presided over by Dr. Thomas Percival, FRS, a strong advocate for abolishing child factory labour in Britain. Owen also learnt from long discussions about science and other topical matters with staff of Manchester College (which later moved to Oxford as a Unitarian training college). It was a period of social ferment. There was the French Revolution of 1788, Joseph Priestley's radical political, educational and religious writing and preaching culminating in 1791 when his Birmingham home was burnt in mob riots. Thomas Paine's *The Rights of Man* was published in that year and re-published frequently thereafter (Paine, 1791). In 1800, Owen married Caroline, a daughter of David Dale, Scottish businessman, banker, preacher, and owner of the New Lanark cotton mills. Owen negotiated a very favourable purchase of the mills for his partnership with his Manchester mill associates and became Managing Partner. In that year, he ended the practice of employing children aged less than ten in the mills (of which Dale had recruited 500 from workhouses at ages upwards of five but cared for their health). During the next fifteen years, Owen satisfactorily survived two partnerships and gained a third with notable and philanthropic people sympathetic to his wish to educate his young factory workers and work generally for better factory conditions. He modernised the New Lanark mills, improved worker housing, and with wise government produced an honest, sober and contented workforce which enthusiastically supported his leadership. He also developed his plans for his 1816 school: *The Institute for the Formation of Character*.

Of that period of Owen's life, historian Podmore wrote:

...it would be unprofitable to enquire too closely how far originality can be claimed for Owen's system of education. Ultimately [...] like all other educational reformers since the French Revolution, he derived his inspiration from Rousseau or from the movement of thought of which Rousseau is the most conspicuous embodiment. (Podmore 1906, p. 126)

Owen, however, believed that all he accomplished in his first 16 years at New Lanark was uniquely his own, developed without others knowing his intentions. Speaking with his bank manager who visited New Lanark in 1816, he said of the New Lanark complex:

It had been entirely conceived by me and constructed under my immediate direction in sixteen years, no one knowing the results I had in view. (Owen, 1857, p. 136)

In 1817, Owen widely circulated newspapers with reports of his two public meetings in London at which he had presented his views on solving the then drastic unemployment situation. In the second meeting he claimed the problem could not be solved until churches accepted the social causes of unemployment; in that claim effectively alienating the churches. Churchmen had already suspected him an infidel. His mass mailings to “opinion leaders” throughout Britain, which cost him the huge sum of £4,000 in that year, could well have reached Downing College at a time in which Richard Dawes completed his M.A. and became bursar and mathematics tutor at that College. Owen’s publicity was not about his school teaching, and his anti-church sentiment might have prejudiced Dawes against his views. All that is speculation. There seems no evidence that Dawes’s teaching at King’s Somborne in 1842-49 was directly influenced by Robert Owen's beliefs and practices during 1816-24.

George Edmondson, the third headmaster, crossed paths with Robert Owen in 1847 when he acquired control of Harmony Hall in Hampshire and the accompanying leases of 800 acres of farmland. Harmony Hall had been built in 1841-3 by Robert Owen as Governor of an Owenite agricultural community, which had failed. The cost of the Hall had contributed to the failure. Edmondson brought his own Quaker tradition. He deemed he had no need to learn from Owen, whom he regarded as a “soulless Socialist.” He renamed Harmony Hall “Queenwood College.” Edmondson’s successor, Charles Willmore, also a Quaker, followed in his footsteps. There was no direct evidence at the close of the century that Frederick Sanderson, the fifth selection, was in any way directly influenced by Owen’s principles of teaching. Alone of the five he did not come to his schools with a clear vision of social objectives; they developed during his years of teaching.

14.3. Engaging student interest: Response to Research Question 3. How did they engage students to be interested in schooling?

That students may differentiate between the overall effect of a school principal and school activities from the personality and effectiveness of individual staff members is no news to any teacher. It was a clear result of the author’s “in-depth” interviews with a small sample of alumni who attended one Australian secondary school during 1930-2000. (Bottomley, 2006). In discussions about science and mathematics

teachers they had experienced, the word “passion” was frequently used in the context: “He/she had/lacked passion.” From the descriptions available to us of Owen’s 1816 *Institute for the Formation of Character* in the new Lanark complex of mills, homes, shops and schools, his teaching methods led to harmony between students and between students and staff. Owen saw his schools as a place of training for the future citizens of his *New Society*, who one day would work together, in harmony, for their common good. Because he believed that social factors, not Original Sin, was responsible for people’s bad behaviour his firm rule was “No punishment!” and his first problem had been to find teachers who could teach effectively without a cane in one hand. The teachers had to be friends of the children and be prepared to base their teaching on children’s interests. For the infant section, nominally for children aged three to five years, the children were happy in their freedom to play, sleep, or hear stories or try to join in the activities of their older brothers and sisters. There was a touch of capitalist endeavour about the situation. Owen, the schoolmaster, wanted children to be influenced by his school atmosphere as early as possible so that he accepted them from the age of two. The mothers were delighted in that they had to walk only a few yards from the nursery school to gain two or three hours of casual work in a mill!

The elementary school was for children aged six to twelve years though many parents withdrew their children at age ten; the age at which Owen, the mill director, admitted children to work in the mills – a fact that Owen as schoolmaster, regretted! Mornings in the elementary school started with the boys and girls marching, singing and dancing to their great enjoyment and that of the many visitors the schools received each day. Owen contemplated the boys when grown up might form the basis of a permanent British army to defend the *New Society*, surely by then established in Britain. David Owen, Robert’s eldest son and successor as school director, merely saw the marching as good for the children’s department

Raymond Williams (1962) wrote:

When Owen talked of human happiness, he was not serving an abstraction but an active and deeply impressive experience. His institution of these schools [...] ranks as one of the major personal achievements of the century (p. 45).

At King’s Somborne elementary school during 1842-49 under the guidance of Richard Dawes, there is, through his descriptions of school life, a sense of pride among the children. The school gained high attendance rates and a willingness

among parents to permit their children to stay longer than was customary at National Schools. Dawes, clearly, had selected excellent teachers to allow it to run smoothly on monitorial lines, initially with three qualified teachers and four assistants. No other teachers were mentioned even by the end of the fifth year when there were nearly 200 students, including 15 boys in a select laboratory class. (The girls were given extra lessons in housekeeping matters with which Mrs Dawes assisted, part-time.) There was a sense of pride in ownership of a comb and toothbrush and a hairbrush for the girls and a few useful schoolbooks. Parents were involved in homework. Meaningful poetry recitation at concerts for parents and for the senior students, fortnightly Friday evening visits to the Vicarage for Sunday school meetings, for which Dawes had no time on Sundays, contributed to the aura of well-being. This sense of pride and involvement was noted by Mosely, a Government Inspector, during his 1849 visit.

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At Queenwood, under both Edmondson and Willmore, there was high student involvement and many opportunities for self-learning. Featured in each issue of the student paper, *The Queenwood Observer*, was a detailed account of lectures delivered by the Chemistry and the Physics Masters, excepting that in the issue for February 28, 1859 it was reported that the Physics Master, Dr. F. R. Smith, was unable to lecture owing to his involvement in a railway accident at Basingstoke, on 22 December, 1858. He resumed his lectures in August, 1859.

Edmondson, as he had done in his previous schools introduced a Mutual Improvement Society which met on Friday evenings and was attended by staff and boys. It was formally conducted with a constitution, minuted activities and planned research. For example, its office bearers in March, 1859 were: President, the Headmaster, Mr. Edmondson, Secretary, Mr Haas (Modern Languages) and eighteen positions filled by students. These were Treasurer (1), Curators of the Museum (2), and for other activities: Printing (3), Mineralogy (2), Zoology (2), Ornithology (2), Entomology (2), Meteorology (2) and Librarians (2).

The Mutual Improvement Society's discussion sessions (*conversazione*) allowed questions and answers between staff and students. In addition, there were individual hobby activities based on the carpentry shop, formal and informal sporting activities, individual and group excursions to factories and places of interest and guest lectures, all of which were described and discussed in the students' newspaper, *The Queenwood Observer*, published by the boys in that year eight times a year, usually with eight pages an issue and in 1859, at one penny an issue.

Other popular activities were unexpected half- or full day holidays for an excursion or cricket match or substitution of gymnastic running for the hour's lesson before breakfast.

By analogy with the teamwork involved in building a machine, Sanderson at Oundle changed the basis of schoolwork from competition to co-operation. Just as construction of a machine required people of various skills and abilities, school work could be tackled by students working in teams and drawn from different school classes. In selecting the parts they would play in the project, students could build on their interests. To meet examination needs, projects could be designed so that team members' work could be assessed individually.

Application of Sanderson's decision called for a change in school architecture and reconsideration of the function of a classroom. For example, Sanderson regarded the library as the laboratory for history and the social sciences. Thus he made space in the library for class work. His aim was to ensure that his school leavers would be able to approach history as might be expected of undergraduates: through critical examination of a variety of sources.

Sanderson also demonstrated his confidence in the senior boys by allowing them to visit the workshops after school hours to complete their work, unsupervised. Collectively, they could take part in the Camera Club activities. By 1900, photography as a hobby was "old hat" and the Camera Club was absorbed into the Science Club which, in particular, for open days, organised and presented large exhibitions of scientific apparatus and engineering equipment to parents and other visitors.(See Chapter 13, Note 2)

14.4 Subjects without borders: Response to Research Question 4. How and why did they include school subjects without any borders?

We live in a world of complex relationships between people, animals and land; between the microscopic and macroscopic; the living and inanimate. Who would have thought in 1816, just after the Napoleonic wars, that children living in a narrow river valley near Glasgow should be given some impression of the world; its construction, physical features, inhabitants, fauna, modern and ancient history? The two monitorial systems had scarcely been invented; the idea of Sunday Schools was

comparatively new. There were the traditional Dame-schools, mostly providing little information to the very young. It was to be more than thirty years before the British Government through its 1851 Census of Education showed that few schools that would have been attended by children of the poor provided even Geography, and long hours of employment in factories prevented many from obtaining any education.

Robert Dale Owen, Robert Owen's eldest son, in October, 1823 completed *An Outline of the System of Education at New Lanark* (Owen, R.D., 1824). He described his father's difficulty to find suitably qualified teachers for the New Lanark schools as "very great." They had to be able to teach without threat of punishment, have a "requisite fund of knowledge", a temperament that would allow them to regard the children as "younger friends" and be able to enter into their games and talk to them out of school hours. (*Outline of System*, p. 9) Their teaching should be versatile, for example:

The intimate connexion between Natural History, Geography, and History is evident so that in lecturing on one of these subjects, the teacher finds many opportunities of recalling to the minds of the pupils various portions of the others. (p. 52)

Owen's recruitment resulted in "teachers (that) are loved, not feared ...the pupils converse with them out of school hours, or even during the lessons ...with the most perfect ease and freedom" (pp. 24-25).

With teachers so qualified the pupils were provided with portholes to the world: they learnt to associate degrees of latitude and longitude with countries and climate. The teachers used large model hemispheres to locate countries, cities and physical features; roller charts with lists of historical items to add time to the physical features. They encouraged the students to rehearse the knowledge they acquired by taking turns to conduct the class.

Owen encouraged his teachers to incorporate moral considerations into these geography/history classes when discussing foreign peoples. They asked the children how they would expect to behave if born into a cannibal tribe? Thereby, Owen preached his theme that society was responsible for individual behaviour and, at the same time, possibly offended Christian missionaries who might have visited the school and who saw their mission as to take Christianity to "savages".

At his 1842 elementary school in King's Somborne, Hampshire, after two years Dawes introduced his *Philosophy of Common Things* "to the teachers and the more advanced of the school-children" explaining the principles "of the things almost daily passing before their eyes." This exercise led to the introduction of a small laboratory classroom occupied by fifteen boys advanced in English and arithmetic who were taught principles of gravitation, hydrostatics, mechanical advantage, effects of heat on metals and liquids, etc., as applied to everyday farm things. It was not clear if a regular syllabus were developed or if the students could nominate topics of interest to investigate; nor if such subjects and laboratory demonstrations were extended to students not in the special class. Dawes mentions no appointment of a trained science teacher for the special class. We may only speculate that even higher academic and social results might have been obtained in Dawes' eight years' management of his school had he had such a specialist teacher on staff.

We know from records that over Queenwood's 48 years its daytime Chemistry and Physics teaching followed a formal syllabus; in its first 15 months Chemistry coverage under Frankland seemed limited only by the numbers of days in the calendar! He presented 82 evening lectures in addition to his regular Chemistry lessons to middle and upper forms. Tyndall's effort with 31 lectures seemed modest. All other staff and five students contributed 37 between them - perhaps a few more as only those noted by Frankland or Tyndall are included in these figures (See Appendix V. It was in the weekends that the students enjoyed scientific activity limited only by their time and interests. (See Chapter 12)

14.5 Experimental methods: Response to Research Question 5. How did they bring science into the school curriculum?

Owen's teachers endeavoured to teach the senior class – eight to nine year olds – some essentials of the scientific method – with what success we do not know. The teachers introduced the idea of animal, vegetable and mineral; named various types of scientists – botanist, biologist, chemist etc. - and broadly described their work. They talked about gravitation, without using the word – simply that larger objects, if free to move, attracted smaller ones. They encouraged the boys and girls to be sceptical of what they were told and try to check with second opinions. [That was a difficult task for the young children as classes were fortunate to have even one book apiece. Owen at that time found it difficult to obtain children' books that were not

admonitory in tone.] The children were assured that scientists were always exploring, always testing; so expected their findings to change.

Already noted in 14.4, Dawes introduced to his senior students the principles behind the working of everyday things that the older students would be aware of in their homes and the farms they might work on. The students in Dawes' laboratory class were up to four years older than Owen's eldest.

Queenwood is well-known to the History of Science for the high academic positions its science teachers attained after they left the school. The journals of Tyndall, Frankland and Hirst tell a great deal about Edmondson's capricious nature and the workings of the school. Frankland's journal provides a picture of his careful teaching in the laboratory, starting with lessons in handling apparatus and his use of graded mixtures for individual practice in analysis. Queenwood acted as a coaching college for Matriculation Examinations of London University with Queenwood students gaining good marks at entrance and during their University courses in Science or Medicine.

Sanderson at Oundle developed a practical method to introduce engineering principles to students. Together, they dismantled an engine, discussed the function of each component. They reassembled it, discussing the engineering required to make each component. Mathematics was brought into use as necessary to solve production problems.

New science students had a term of familiarisation to allow them select a science to study and to gain some feeling for its relevant apparatus. They learnt about its pioneers; the value to society of original and current discoveries; the direction of current research and hoped-for results. Sanderson called that phase exploring the *Romance of Science*. Having selected the science he wanted to study, the student spent the remainder of his first term learning how to plan and conduct experiments. In the second term the student joined his selected faculty which Sanderson had endeavoured to equip to resemble a professional research station. The student should then feel he is on the threshold of becoming a scientist – discoveries await his attention!

14.6 Student self-learning: Response to Research Question 6. What opportunities did they provide for student self-learning and application?

“Self-learning”, the ability to discover and constructively apply one’s discoveries in the absence of a teacher is, surely, the aim of education! The aim within a small field of every lesson; the desired outcome of every course of instruction! For the most part our teaching is formulaic; we teach method. “The scientific method” is surely one of the most successful? Are other methods and “non-methods” based on chance procedures likely to be applied at below tertiary levels? Such are questions for today. The five headmasters studied provided opportunities for student self-learning. Robert Owen at New Lanark, two hundred years ago, distinguished for his young children subjects that provided methods for learning such as music notation, even reading, and subjects that provided information such as history and geography. The opportunity to apply information was given in the classroom by having the children take on the role of the instructor; to use the teacher’s rod to point to places on large models of the world and historical notes on roller wall charts to revise class learning. Owen himself learnt. He had designed large classrooms expecting to apply monitorial instruction procedures but found it more efficient to teach in small groups. His son, Robert Dale Owen, who succeeded his father as the headmaster, emphasised in his 1824 description of *The Institute for the Formation of Character* that everything should be considered as experimental and subject to change as experience should dictate.

Eighteen years on, Richard Dawes experimented with methods of introducing science to his village school. He described his *Philosophy of Common Things* by which he introduced a general science to his school children based on everyday objects; in his small laboratory class for boys with good marks in Arithmetic and English his young assistant teachers were, it seemed, able to present set-piece experiments in heat, sound and levers (although Dawes gives little information about who and how the regular science teaching was conducted) and in 1847 or 1848 he “borrowed” Edward Frankland, Chemistry Master at Queenwood College, from George Edmondson, to give several public lectures on Agricultural Chemistry in King’s Somborne.

At Queenwood College in 1847, George Edmondson introduced his Mutual Improvement Society which, as shown in Chapter 12, by 1857 involved many of the

boys in handicrafts, research activities and in preparing reports and lectures. Charles Willmore continued the intellectual activities of the Society and introduced the boys to the beauties of the local countryside through regular Sunday walks but the activities lacked critical mass as the numbers of students declined.

By analogy with the teamwork involved in building a machine, Sanderson changed the basis of schoolwork from competition to co-operation. Just as construction of a machine required people of various skills and abilities, school work could be tackled by students working in teams and drawn from different school classes. In selecting the parts they would play in the project, students could build on their interests. To meet examination needs, projects could be designed so that team members' work could be assessed individually in the Oxford Middle-class examinations in the subject of "Library Work" initiated by Sanderson

Application of Sanderson's decision called for a change in school architecture and reconsideration of the function of a classroom. For example, Sanderson regarded the library as the laboratory for history and the social sciences. Thus he made space in the library for class work. His aim was to ensure that his school leavers would be able to approach history as might be expected of undergraduates: through critical examination of a variety of sources.

14.7 School engagement with society: Response to Research Question 7. How and in what ways did their schools engage with society?

All five headmasters strongly supported his school actively involving itself with parents and local society. At New Lanark the school stood between the four mills and the workers' row of dwellings and two miles or so up and over a hill from the old town of Lanark where some of the mill workers lived. Owen invited all parents to wander into the school at any time and give him their opinions. Unfortunately for Owen, they pressed him for two changes he did not want to make: to introduce student reading at an earlier age than he thought appropriate and to introduce the Catechism – Scottish Presbyterian – which was entirely against his principle of "rational education" by which decisions of faith should be left to a later, rational age.

At King's Somborne, Dawes embarked on a program to stimulate parents' social awareness via problems set in the children's homework.

At Queenwood, staff regularly gave lectures at the nearby Romsey Self-improvement Society; the school music master became conductor for the near-by Broughton Music Society and the School invited Broughton folk and journalists to its Summer Concert, to school open days and other special events.

At Oundle, the school Science Club organized an elaborate science and engineering display for the Senior School Open Day and the Junior School organized a Cultural event for its Open Day.

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14.8 Opposition to headmasters' practices: Response to Research Question 8. What was the opposition to the headmasters practices

There were limits to the Headmasters' activities though precise reasons for their cessation may not be known, Owen as headmaster of *The Institution for the Formation of Character* was sacked by his partners in 1824 and the "pagan" aspects of his curriculum abolished. Perhaps, his partners were aware his interest was shifting from New Lanark to a new enterprise in U.S.A.; perhaps as Managing Partner his yet another absence – crusading in Ireland in 1823- broached the limit of his absence from mill responsibility; whichever or all reasons brought to a head the declining goodwill of his partners.

The decline in Dawes's school in King's Somborne started with his promotion at the end of 1849 to the Deanery of Hereford. Dawes had boasted any enthusiastic clergyman could be as successful as he had been with the school but he underestimated his contribution as a highly trained academic and experienced business manager and seemed to underestimate the strength of opposition from other clerics in the National Schools Association. By the date of his death in 1867 little sign remained of his exceptional school at Kings Somborne.

Queenwood under Edmondson prospered and as student publications indicated, under the organizing of the Mutual Improvement Society it was an exciting place for students in 1859. Under Willmore, the student publications for 1887 indicated the numbers of students were falling and the student organization was simplified. The ratio of students to staff in the school activities was reducing. By 1893, student activities were few and the school closed in 1896. It was surmised as that date coincided with a high point in education standards and low charges of city Board schools it became difficult for a small, private, relatively expensive county boarding school to attract students.

Frederick Sanderson died in 1922. His successor, a science man, did not appreciate Sanderson's teaching methods; student competition was restored and no further thought given to re-thinking the function of a classroom.

14.9 Conclusion

Initially, this was to be a study of the teaching of science in Britain in the days when school science was novel. Five headmasters who were known to teach science were selected for study. It was quickly apparent they had developed ideas of a new society which recognised the power of science to change society and that they could use science to attract students to their schools. A broad title was assigned to the study which put no restriction on its scope: *Science, Education and Social Vision of Five Nineteenth Century Headmasters*. They were men of various times and with various types of schools.

The five headmasters were most similar in what they were not! They were not upper-class; had not attended any one of the great public schools and had followed no easy path to gain their education. They were similar in addressing the whole complex experience of education, at once personal and social, between the poles of the

isolated individual and the totally realized society; they saw in Science the development of possibilities, even at times a transformation of ruling conventions. The positive reference, the source of values and explanation, is not the isolated individual of the classics, but at the other pole; the totality, the historical process. Their achievements were major originalities, not because they entered a new scientific world, but because they valued an old world differently. In seeking today new educational methods and settings in science education as a vehicle for general education, as well as a form of pre-professional education, we must view the educational inventions of these headmasters and those needed today against the dull methods and forms of expression of the time. It is the connection between a structure of feeling and conventions that is in the end emphasized in this study; their particular methods, without their consciousness, were merely fashionable techniques.

We owe to these founders not only strong founding positions on the value of science in education and for understanding science contribution to society but what were for their times radical propositions for engaging their students in research and practice.

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APPENDICES

Appendix I SELECTED 19TH CENTURY STATISTICS

I.1 Selected nineteenth century statistics: Population, Education, Trade and Price index

Table I.1.1

British population in millions: 1801-1921

	Total	England & Wales	Scotland	Ireland
1801	16.3 (a)	8.9	1.6	5.2
1851	27.7	17.9	2.9	6.9
1901	41.5	32.5	4.5	4.5
1921	42.8	33.5	4.9	4.4

Includes estimate of 600,000 men in armed services

Source: Julie Jeffries, *The U.K. population: past, present and future*. U.K. Office for National Statistics. Available from www.statistics.gov.uk/downloads/theme.../01_fopm_population.pdf

Table I.1.2

Children (age 5 – 15) in thousands: England and Wales, 1841-1901

	England & Wales
1841	3,637
1851	4,005
1901	6,829
1921	7,179

Source: B. R. Mitchell, *Abstract of British Historical Statistics*, Cambridge, (1962, p.41)

Table I.1.3*Children in primary schools in thousands: England and Wales, 1850-1911*

	England & Wales
1850	250
1851	323
1861	799
1871	1,336
1881	3,015
1891	3,871
1901	4,923
1911	5,367

Source: B. R. Mitchell, *Abstract of British Historical Statistics*, Cambridge, (1962, p.41).

Table I.1.4*Population of major U.K. cities in thousands: 1801-1901*

	Liverpool	Glasgow	Manchester	Leeds	Birmingham
1801	82	77	70	53	66 (1811)
1851	376	329	303	172	233
1901	764	762	959	430	654

Sources: 1801/51 figures for Liverpool, Glasgow, Manchester and Leeds from Peel Web. Other figures from [www.centreforcities/](http://www.centreforcities.com/)
www.understandingglasgow.com/ www.birmingham.gov.uk/
 No allowance has been made for changes of city boundaries.

Table I.1.5*Price index for British pound – 1751-2001*

1751	5.0	Goods that required £5 in 1751 required £15.1 in 1801. In the 19 th century the purchasing power of the £ largely recovered after the Napoleonic wars and their ensuing depression only to be weakened by WW1 and WW2 and further in the 20 th century.
1801	15.1	
1851	8.1	
1901	9.2	
1921	23.1	
2001	683.7	

Source: U.K. Office for National Statistics, *“Consumer Prices Inflation since 1750”*

Table I.1.6*Major U.K. imports 1801-1851: top five commodities by value (£000)*

	Raw cotton	Corn	Sugar	Tea	Coffee
1801	1,629	303	5,436	2,980	4,608
1811	3,148	466	5,346	2,121	3,765
1821	4,347	273	5,739	3,073	2,771
1831	9,612	4,726	7,534	3,165	2,669
1841	15,948	5,238	6,845	3,079	2,686
1851	24,582	14,178	12,276	7,147	3,318

Source: B. R. Mitchell, *Abstract of British Historical Statistics*, Cambridge, 1962, pp. 289-291

Table I.1.7*Exports of cotton yarn and cotton manufactures— by value (£000)*

1781	296
1791	1,637
1801	6,941
1811	12,261
1821	23,542
1829	37,269

Source B.R Mitchell, *Abstract of British Historical Statistics*, Cambridge, 1962, p. 293

I.2 Nineteenth century expansion of British Empire

By 1870 Britain had lost its American colonies but had gained Canada, Australia, New Zealand, Cape Colony, Ceylon, Singapore, British West Africa, Penang and Malacca, Hong Kong and the Kowloon Peninsula, India and Burma.

Source: *British Empire: Nineteenth Century Timeline: Available at <http://www.britishempire.co.uk/timeline/19century.htm>*

I.3 Scientists and social class – Chapter 2, Table 2.1 extended

Nicholas Hans (1951) described people with entries in the Dictionary of National Biography as the “intellectual élite”. There were about 5,500. He selected 3,500 who were born between 1685 and 1785 and completed their schooling in the U.K. to obtain a picture of the élite’s education in the eighteenth century. (See Chapter 2,

Table 2.1) Hans separately selected a sample of persons who in the eighteenth century had made “original contributions to the advancement of pure or applied science”. That yielded 494 scientists; 364 who had already appeared in his original sample of 3,500 “intellectual élite” and 130 who had not as they had by-passed schools (a criterion for selection in the first sample) with apprenticeships or were self-taught (autodidacts). Hans noted that about 80 per cent of the 494 scientists were Fellows of the Royal Society.

To compare the scientists with non-scientists with respect to social class Hans removed data for the 364 from the 3,500 and also those lacking information about parents’ occupations. The net effect which appears in the following Tables A2.9 and A2.10 is that the social status of eighteenth century scientists was significantly lower than that of non-scientists.

Table A2.8

Social class of 18th century intellectual élite and scientists as defined by parents' position

Eighteenth Century Social class as defined by parents' rank	Non-scientists in intellectual elite		Scientists in intellectual elite	
	3,000*		494	
	no.	%	no.	%
Group A				
Peers	182	6.3	2	0.4
Baronets, squires, gentlemen of independent means	735	25.6	120	24.3
Clergy, Church and dissenting	609	21.2	71	14.4
Medical profession	144	5.0	42	8.5
Teachers and professors, not in Holy Orders	47	0.6		
Lawyers	86	3.0	32	6.5
Other professions including artists	65	2.3		
Army, navy and civil service	113	3.9	19	3.8
TOTAL GROUP A	1868	68.9	286	57.9
Group B				
Merchants and traders	436	15.2	84	17.0
Farmers	239	8.3	35	7.1
Craftsmen and retailers	206	7.2	77	15.6
Factory and land workers	10	0.4	12	2.4
TOTAL GROUP B	891	31.1	208	42.1
Unknown	excl. 129**		-	

**The base was 2,872 after allowing for an error of +1 in the original table and unclassifiables.

Source: Nicholas Hans, *New Trends in education in the eighteenth century*. London: Routledge & Keagan Paul, 1951, Tables IV and V.

Hans also identified from the DNB 176 seventeenth century scientists and although a small sample its comparison in the following Table A2.10 with scientists from the eighteenth century indicates the increasing “democratisation” of science practitioners.

Table A2.9*Social class of 17th & 18th century scientists as defined by parents' social class*

Social class as defined by parents' occupation	17 th C. scientists		18 th C. Scientists	
	no.	%	no.	%
Group A: Upper & professional class	144	77.4	28	57.9
Group B: Middle and working class	42	22.6	20	42.1

Source: Nicholas Hans, *New Trends in education in the eighteenth century*. London: Routledge & Keagan Paul, 1951, Table V.

Appendix II HISTORICITY OF JANE BENSON'S 1879 "FROM THE LUNE TO THE NEVA"

David Thompson (1956) implicitly accepts Benson's book as a valid reference, twice citing her book on p.25 of his article. G. J. Holyoake in his Dictionary of National Biography (DNB) article (rev. M.C. Curthoys, 2004) cites Benson's book as a source of information about Edmondson. Charlotte Fell-Smith, in a DNB entry for Daniel Wheeler (rev. H. C. G. Matthew, 2004) who led the Quaker work party to Russia, states that the party sailed from Hull for St. Petersburg on 22 June, 1818. Benson's account named the *Arethusa* as the ship which gave the party a fast voyage. Reference to ship records indicated *Arethusa* was built for the British navy towards the end of the Napoleonic wars, became surplus to requirements and was sold to a private buyer.

Brock (1996, p.4n) refers to Benson's book as containing "a fictional account of her parents' early lives together." Is it reasonable for a reference, like the Curate's egg, to be good in parts? Jane Benson did not set out to write an historical reference. She printed a thousand copies of her family story and with Quaker caution, bound only 500. She gave all her characters a nom-de-plume. The book sold well. In her preface to the second 500, she said her readers had correctly identified her characters.

Benson's account published in 1879 agrees closely in many pages with Henry Thompson's *History of Ackworth* published in the same year and each precisely quotes sayings by various Old Boys of Ackworth. Benson does not footnote each quotation but indicates her sources with statements such as, "We read amongst the old minutes of the Committee [...] (p.35)."

About the Quaker work in Russia, Benson might have had her father's letters written from Russia to her mother before they were married, correspondence from Daniel Wheeler (the Quaker missionary who was leader of the Quaker party in Russia) to the Quaker Meeting in Hallam, Sheffield which her mother and grandparents attended, and several volumes of Wheeler's "Letters and Journals" published in London between 1835 and 1843. Jane interspersed her narrative about her father based on Ackworth School Committee minutes with a romantic but not implausible interpretation of her parents' occasional meetings at Ackworth when they were aged

about eleven and twelve; and, later, at Broom Hall College when Edmondson was apprenticed to Anne's father.

Overall, Jane Benson's book makes sense of others' abbreviated notes. For example, Holyoake's note in his Dictionary of National Biography indicates that Edmondson was apprenticed to William Singleton and that a "well known Friend, Daniel Wheeler, taught Edmondson agriculture." How could that be? Edmondson started his apprenticeship with Singleton about the date of his fifteenth birthday, 8th September, 1813 and on 22nd June, 1818 sailed with Wheeler's party to Russia. There was not time for Edmondson to complete a six-year teacher apprenticeship and learn agriculture. Benson's book provided an answer: Singleton made over the final years of Edmondson's apprenticeship to Wheeler who was seeking a Quaker to tutor his children in Russia and also to work on the land drainage project. There was no coincidence about this result as the Singletons and their children, Edmondson, Edmondson's close friend from childhood, and Wheeler and his family were all known to each other as members of the local Hallam Quaker Meeting.

Appendix III GEORGE EDMONDSON AT ACKWORTH SCHOOL

Holyoake, (2004, p.1) describes Ackworth "as a better English middle-class school than existed in the country at the time" but "low middle-class" would have been a more accurate term. It was certainly too expensive for the labouring class although the purpose of Ackworth was to supply education to Quaker children from families "not in affluence." Initially the school fees were £8.8s per child, later raised to £10 for a year's board, clothing and education. The school operated only because it was subsidised by Quaker donations and voluntary help. Even so, Edmondson's parents who were retailers could afford to send George to Ackworth only with a supplementary grant from their local Quaker group. At that time, labourers would have required large subsidies for their children as £10 represented twenty to thirty weeks' wages for a labourer or a year's salary for a resident assistant master at Ackworth.

On their first morning, the boys were aroused at 6.45 (in summer at 6 am). They dressed, walked down to the ground floor, where they kept their shoes, and into the cellar to wash in a shallow trough. When half had washed the water was changed for

the other half. They went outside to gargle and were then marched to a classroom for an hour's work before 8 am breakfast. On their second morning they were aroused at 5.30 am to bathe. For this they were marched about a mile to a mineral spring, where they dropped their clothes on the ground (or snow in season) and jumped or were thrown into the icy water. They ran around to dry, dressed and were marched back to school for their hour's lesson before breakfast. It was the girls' pleasure to bathe on alternate mornings, having the luxury of a changing shed.

There were two class rooms: the writing room and the reading room each occupied alternately by half the number of boys. Lessons could occupy eight hours a day, six days a week. They were from 7-8am, 9am to midday, 2pm to 5pm and an hour in the evening to prepare their lessons for the next day. There was a roll-call at 8pm, a Bible reading and to bed. As they ate their meals in half an hour or less, the boys' play time totalled about 3.5 hours a day. Their favourite game was long rope skipping at which they became expert, and when there was snow on the ground; they enjoyed "sliding" on it. There was a "garden" area where the boys could create their own clay-castles or miniature homes.

The girls' education included knitting, sewing and shirt-making, reading, writing, arithmetic. In 1807, they were introduced to geography.

Punishments consisted of caning or imprisonment "in a light and airy" room with the window painted over on the outside or shuttered. The boy to be punished was placed in the room at 6 am and taken back to bed at 10 pm. He had a table and chair, a Bible and possibly the school spelling book. He was served reduced rations. Benson (p. 44) describes meeting one old boy who had been so imprisoned for four weeks. Henry Thompson describes three such punishment rooms and a fourth, harsher still, with little day light and only a log for the boy to sit on.

The boys and girls were strictly segregated; even for the occasional excursion the boys went one day, the girls another. It was not, at that time, 'co-educational' as described by David Thompson (1996, p. 4). On some days the boys were taken for a walk on the adjacent common. The boys and girls came together only on Sundays for a joint assembly to listen to Bible readings.

The boys most consistently appreciated their daily breakfast of porridge and milk; least appreciated their 6 pm supper of two thick slices of bread with a dab of butter or cheese. Dinner varied. On Mondays and Fridays there were hot meat and vegetables, followed by a pudding; Tuesdays and Thursdays, there was pudding only; Wednesdays and Saturdays, “lobscouse,” described by Benson as “a sort of resurrection dish.” Dinner was special on Sundays; when in season fruit pies were served or otherwise cold rice pudding with raisins together with a tinfal of very small (i.e. weak) beer. Note that Quakers did not use the days’ pagan names: Sunday was ‘First Day,’ Monday, “Second Day,” etc.

What did Edmondson learn in his two years at Ackworth? As indicated, there were two classrooms: the reading room and the writing room, but with a little imagination almost any subject could be introduced under those titles. Benson mentions only arithmetic and simple accounting as other subjects; no mention of history or geography; no mention that Britain was at war with France or that a British army under Wellington was fighting with the Spanish against French armies invading Spain and Portugal. Benson scathingly commented (p.11):

From ignorance of the progress in the great world, comparing themselves only with themselves, the authorities of the out-of-the-way little world at Ackworth considered themselves perfect. They endeavoured to stand still, to remain as they were; but that being impossible, they ended in slipping backwards.

Benson (p. 62) summed up the Ackworth education:

Those who were fortunate enough to be sent to Ackworth – I think we may fairly place it before the other schools of its time – had been thoroughly drilled in the “three Rs”, and in spelling. What more could they want? Men and women who could read, write and spell well, who could keep accounts correctly and check promptly their tradesmen’s bills, possessed powers greatly in advance of those to be gained generally by people “not in affluence”.

Appendix IV EDMONDSON’S BÊTE NOIR – THE OWENITE QUEENWOOD FARM COMMUNITY

Edmondson allowed, even encouraged, a legend to develop suggesting his moral superiority to Robert Owen and to those in the Queenwood Farm Community, which had failed financially in 1845 providing him with an opportunity to take over Owen’s Harmony Hall for his school building and to rename it Queenwood College. It is of

interest therefore to glimpse, with the aid of Royle's 1998 research, the informal adult education and the schools in the Community.

Owen was involved with many worker societies with overlapping memberships. His building for the Queenwood Farm Community played a short role in his education activities but a long one in the history of Queenwood College. The Queenwood Farm Community according to Royle (1998, p. 95), was controlled by the Universal Community Society of Rational Religionist, itself formed in 1839 by merging the Association of All Classes of all Nations and the National Community Friendly Society, both of which were strongly influenced by Robert Owen who from 1814 had widely promoted the idea that capitalist society could be reformed through highly moral residential agricultural or industrial co-operative communities. Owen argued that the communities would gradually attract large numbers of workers and higher class people, and by their example they would bring about a moral reform in Britain, and the world. Owen built Harmony Hall as a palace for the Queenwood workers, incurring in the process a princely sum of £15,000 for the building and its expensive fittings, a sum which the supporting societies did not have.



Figure A6.1 Owen's Harmony Hall: Built 1841

Figure IV.1 Owen's Harmony Hall: Built 1841

The architect was Joseph Hansom (designer of the Hansom 'safety-cab') who favoured what was described as the 'Italianate' style. Robert *Fig.A6.1 Owen's Harmony Hall: Built 1841* Owen on 30 August, 1841, at age seventy, laid its foundation stone; he established a works nearby to provide the bricks, and directed the building operations. Harmony

Hall was advanced in design. It had central heating which extended into the walls of the kitchen garden, but it did not work! There were WCs close to all the bedrooms and dormitories, piped water and a waste disposal system for each bedroom, and bathrooms in the basement. There was a mechanical device to deliver food from the kitchen to the large dining room. Public rooms provided space for social functions, lectures and congress meetings of the Community supporters. There were three school rooms with nearby dormitories for forty residential students, four studies for teachers, and accommodation for ninety-six other adults. Member of associated societies and friends could arrange to visit: corresponding per the new, 'penny-post (per half-ounce) system and travel by the new train service to Winchester, thence the coach to a near-by village. By 1845 when the Community failed financially, a train station was built four miles from Harmony Hall. Royle (1998, pp. 166-7) indicated:

Alongside the farms, the most important activity at the (Queenwood) community was education, which was always more important than just its schools. Education in its broadest sense was the life of every member of the community lived in the spirit of harmony through work and leisure.

In November, 1839, enthusiastic members of the various affiliated organisations arrived to live and work in the new community, referred to in Census records as the Queenwood Farm Community. According to Royle (1998, p. 84) "There were twenty-eight men, nine women and eight children ... They included agriculturalists and men with a wide variety of skills in the building trades." Work started to provide adequate accommodation but it could not be completed quickly and the first inhabitants passed a cold winter in cramped quarters. They did not neglect self-improvement. Their first winter program was intensive. Royle (p. 167) described it: "After tea and a public business meeting the daily programme was: "Monday – a dancing class to eight o'clock; Tuesday – a drawing class followed by grammar until nine; Wednesday – agriculture and botany followed by dancing; Thursday – instrumental music and an early ending at eight; Friday – geography followed by education; Saturday – vocal music until eight. There was a daily mathematics class from five to half past six in the morning." There were fewer residents in the second winter and the program was modified. They worked from six in the morning to five in the afternoon – no early mathematics class. Mondays – singing until half past nine or ten; Tuesdays – a special class for women (there were four); Wednesdays – grammar and similar studies, but this was not popular. Otherwise "conversation,

books and newspapers seem to have filled the leisure hours” (Royle, p.167). Sundays were at leisure. In the evenings the ‘family’ might have informal discussions with the acting governor, James Rigby.

Some found their visions of a socialist community did not match the Queenwood reality, and others lacked the skills necessary to develop an agricultural community so that numbers reduced. By the 1841 census the residents were down to “nine adult males, four females, eight children, a local servant girl and two local ploughmen” (Royle, p. 86).

In 1842 the community was able to move into part of the incomplete Harmony Hall and regular adult classes resumed during the 1842-3 winter. Each weekday evening, after tea, there was a discussion on the business of the community followed on most evenings by classes until ten o’clock. Topics included dancing, singing, instrumental music, French, writing, arithmetic, drawing, ‘a practical subject’, English grammar, elocution and discussion of articles in the supporting newspaper, *New Moral World*. On Sunday evenings, there was a lecture on “the principles and objects of the Rational System of Society” (Royle, p. 168). Before and during its time in Harmony Hall the Community maintained a library of books donated by the Community’s supporters. Royle (1998, p.169) wrote

This programme of educational leisure, rational amusement and mutual self-improvement was significant in the community for it spelt out something about the quality of life. ... Opportunities for working-class self-expression, outside the culture of the public house were rare ... and even rarer, for women.

In 1842 the community established an infant school for children under seven and, towards the end of the year, as described by Royle, sought a teacher to take charge of a “Boarding House and Educational Establishment at Harmony Hall.” School fees were to be £25 per year but children of community parents were free and there were reductions for children of members of associated societies. In addition to the existing infant school there was to be an elementary school for children seven to fourteen and a polytechnic. The elementary school was to offer “every department of useful knowledge, now taught in the best schools combining practical as well as theoretic instruction in the Arts and Sciences.” The polytechnic was to provide youths over fourteen with an education in the theory and practice of agriculture and the other trades carried out in the community. The overall aim described by Royle, was “to fit

the pupils to become highly intelligent and active member of colonies formed upon scientific principles.” So that, twenty-six years after Owen’s New Lanark school, *The Institute for the Formation of Character*, and after he had lost much of his money in attempting in the 1820s to develop the *New Harmony* colony in America, Owen and his supporters in England still saw their educational ventures as gateways to communities which would transform capitalist society.

The numbers of children in the Harmony Hall schools totalled thirty-five boys and twenty-six girls in 1843, ninety-four in 1844 of whom sixty-four were paying fees but in 1845 it fell to seventy-one of whom only thirty-five were paying fees. The number of children coming from outside the community indicated the location was not a barrier for a boarding school and that the school aims could attract students. However, the number leaving quickly – fifty-six between April 1843 and December 1844 – indicated bad management.

Royle (pp. 171-181) described the schools compounding problems: appointment of a head teacher not in sympathy with a rational and secular school syllabus, reduced fees to attract more students when the school was already operating at a financial loss; teachers inadequately trained to conduct a school without punishments, changing the curriculum to that of a school of industry without reference to the paying parents all indicated a management based on hope, not rational behaviour. The financial collapse of the schools at the same time as that of the farm community now based in its very expensive and partly unpaid-for building led to their closure on 29 September, 1845

Appendix V Queenwood College Evening Lectures, Chemistry Examinations, Staff Activities, Mutual Improvement Society, Student numbers and Staff Details

During the first fifteen months of Queenwood College’s existence, Frankland and Tyndall contributed to four “schools”: a normal, hard-working day school, an agricultural college, an evening institute and with other staff, to the School’s Mutual Improvement Society.

V.1 Evening lectures

The Queenwood Reporter for February 15, 1848 referred to “the following outlines, furnished by two of our lecturers [who] will exhibit their plans for the present year.” Thompson, D. (1955, p. 249) interpreted the statement of intent as a statement of

accomplishment. He wrote: "Here is the joint scheme of science lectures given by Frankland and Tyndall during the year 1848" and reproduced the syllabus (Table A7.1 below) in his 1955 article. In their journals Tyndall and Frankland indicated they were asked for their lists at short notice, and as indicated in Tables A7.2 and A7.3 had delivered 41 of their science evening lectures in 1847.

Table A7.1

Syllabus of evening lectures planned or given by Tyndall and Frankland

Tyndall's syllabus

The Steam Engine.

Watt's single and double acting engine, cylinder, condenser, air-pump. Expansive principle; laws of Dalton and Mariotte. Motion of rotation; the crank, the eccentric, sun and planet motion, its mechanical principles. The governor; laws of vibration. Pistons, packed and metallic. Boilers; steam space, and water space, steam gauges; the indicator. Contrivances to prevent explosion; safety valves, fusible plugs. Horse-power; rules employed to determine it. Locomotion; high pressure engines; early forms of the locomotive, Trevethick's engine, walking engine; fictitious difficulty with regard to adhesion, rack rails. George Stephenson. Sub-division of flue into tubes, recent improvements, lengthening of boilers; Stephenson's patent. General Paisley.

Railways.

Choosing the ground; trial levels, survey, parliamentary levels, plans and sections. Instruments; the spirit level, the theodolite, the transit instrument. Standing orders; serving notices, depositing, passage of a railway bill through parliament. Working section, cross sections, cutting and embanking, curves and slopes. Tables for earthwork;

Frankland's syllabus

"Inorganic Chemistry.

The nature and properties of all the elementary substances and their compounds; the atmosphere, its constitution, the principles involved in ventilation; water; its physical and chemical properties; its supply to towns; causes of hardness in water, and methods of their removal. The chemistry of irrigation and drainage. The properties of metals and their alloys; methods employed in extracting them from their ores; their various uses in the arts. Chemical properties and preparation of acids, bases, and salts. Theory of dyeing and calico-printing. Application of chemistry to the manufacture of porcelain, earthenware, etc.

Organic Chemistry.

The constitution of organic compounds. Composition and properties of saccharine and amylaceous bodies ; gum, pectine, lignine, etc. The processes of fermentation and decay ; manufacture of fermented liquors, alcohol, vinegar, etc.

Agricultural Chemistry.

Relation between the animal, vegetable, and mineral kingdoms. The nutrition of plants and animals. The origin of soils, and their adaptation to the growth of different species of cultivated plants. Theory of manuring, applications of chemistry to the determination of the relative value of manures, substances used in the feeding and fattening of cattle, etc. Ashes of plants. Effects and uses of fallow. Rotation of crops, etc.

Botany and Vegetable Physiology.

Object and design of the science. Adaptation of plants to the circumstances in which they are placed. Elementary tissues. Organs of plants, their structure and functions. The root. Stem, leaves, and flowers. Division of plants into three great classes. Eddogens, Exogens and Acrogens. Classification of plants, Linnaean or artificial system. Natural system. Cultivation of the grasses. Cereals, tubers, etc. Application of the science to agriculture.

V.2 Details of evening lectures recorded by Tyndall or Frankland

Evening lectures were a feature of the Queenwood curriculum. Whether, because of their intensity, they were to the students during Frankland's and Tyndall's fifteen months at the College might be debatable as the students received at least 60 in the first (half-year) term; 56 in the second term and 24 in the first half-term of the 1848-49 school year. As only those listed in either Frankland's or Tyndall's diaries have been recorded in the following Tables the total number of lectures could have been greater, especially after the first term. By the second term Frankland and Tyndall were frantically preparing themselves to be Ph.D. candidates at a German University and did not attend every lecture. Also, there are occasional gaps in their diaries. Of the 140 recorded, Frankland delivered 82 (59%), Tyndall 31(22%) and all others 19%.

Figure 3:

Summary of Evening Lectures at Queenwood College during the 15 months Frankland and Tyndall taught at the College (Details from Tyndall's and Frankland's journals)

1847-48: First term: August-December		1847-1848: Second term, January-June		1848-49: First term, first three months: July-Sept.	
	<u>no.</u>		<u>no.</u>		<u>no.</u>
Frankland	27	Frankland	37	Frankland	18
Tyndall	14	Tyndall	12	Tyndall	5
Yeats	8	Yeats	3		
Edmondson	3	Edmondson	1	Edmondson	-
Davidson	3	Cockayne	1		
Singleton	2				
Fawcett - stdnt	2	Fawcett - stdnt	1	J. Mansergh-stdnt	1
R. Mansergh – stdnt	1	Johnson Bailey - stdnt	1		
Total	60	Total	56	Total	24

Of the total 140, Frankland delivered 82 (59%), Tyndall 31(22%) and all others 19%.

Table A7.3

Evening lectures at Queenwood: First term (August-December, 1847) as recorded by Tyndall or Frankland

Date	Lecturer	Subject
Aug. 23	Edmondson	Subject not stated by Tyndall
Sep. 8	Tyndall	Management of the human skin (1)
Sep. 13	Mansergh (stdnt)	Lancashire
Sep. 14	Tyndall	Skin (2)
Sep. 15	Frankland	Botany
Sep. 16	Tyndall	Skin (3)
Sep. 17	Frankland	History of Chemistry: The work of alchemists, such as Hermes Trismegistus, led to the science of Chemistry which, today, contributes to agriculture and technology. But do not think that a science develops by chance. It requires a scientific mind to detect general laws from many facts.
Sep. 20	Frankland	Utility of Chemistry: F. instanced gas and safety lamps; Bunsen's and Playfair's recent research which showed that 80% of coal energy used in smelting iron &c is wasted; chemical analysis may show deficiencies in soil or quality of water used in irrigation; conditions in which peat earth or particular minerals are good or bad for the soil; Earl of Chichester's oil cake.
Sep. 21	Tyndall	Skin (4)
Sep. 22	Frankland	Half-holiday school excursion to "Deanbury Hill from which we had a magnificent prospect". F. used the surrounding flowers for a lecture on botany
Sep. 23	Edmondson	Not stated
Sep. 24	Frankland	Specific gravities.
Sep. 30	Tyndall	Skin (5)
Oct. 1	Frankland	Specific gravities of fluids and vapour
Oct. 2	Frankland	The properties of the atmosphere: A most interesting lecture. The experiments were very effective.

Date	Lecturer	Subject
Oct. 4	Frankland	Cohesion and repulsion: F's experiments proving the change of law regarding water which takes place from 40 ^o F downwards were very beautiful indeed.
Oct. 5	Davidson	Eclipses
Oct. 7	Tyndall	Skin (6)
Oct. 8	Frankland	Heat. F. discussed thermometers from "Galileo's first rude invention to the present time." He demonstrated the differential thermometer and that the same quantity of heat produced different expansions with various liquids; introduced idea of specific heat; the Fahrenheit and Centigrade scales and how to convert one to the other.
Oct. 9	Singleton	Perspectives
Oct. 11	Frankland	Heat, continued: F. discussed freezing and boiling temperatures of various liquids and solids. He introduced notion of latent heat.
Oct. 12	Edmondson	Agriculture
Oct. 13	Frankland	Botany. F. discussed the cellular tissue of plants and trees; its composition and how it functioned; photosynthesis; the movement of water in stems and roots; directions of plant growth.
Oct. 14	Tyndall	Skin (7). Effects of diet and clothes
Oct. 15	Frankland	Latent heat. (This was a major lecture by Frankland on heat and pressure of which Tyndall made extensive notes and diagrams.) F. discussed the latent heat required to convert a frozen substance to a liquid; to a vapour and to reverse the process. He discussed the formation of various crystalline products. He demonstrated the range of temperatures required to obtain various pressures of water vapour by heating water in a closed vessel and the temperatures at which water boiled under low pressures. He discussed the surface area of a boiler required to heat various volumes of water, alcohol, ether and turpentine.)
Oct. 17	Frankland	Distillation: fractional distillation of mixtures of liquids by taking advantage of their respective boiling points.
Oct. 19	Davidson	Astronomy
Oct. 21	Tyndall	The natural history of a Railway Bill
Oct. 23	Yeats	Life of Pestalozzi – Tyndall thought "most interesting"
Oct. 25	Frankland	Revision. F. examined the boys on his previous lectures.
Oct. 26	Davidson	Astronomy – Measuring the circumference of the earth

Date	Lecturer	Subject
Oct. 27	Frankland	Chemistry. Frankland lectured on Chemistry and exhibited a number of beautiful experiments. He contrasted three types of combination: a physical combination achieved by pressing two smooth metal surfaces together with a pressure of about 40 pounds to “make them as immoveable as a solid mass but yet the atoms are not in contact”; solutions, such as 3 quarts of oxygen dissolved in 100 quarts of water; and chemical combinations, several of which were explosive. - chlorate of potash and sulphur when ground in a mortar combine and explode with a crackling sound. - chlorate of potash, sugar and strong sulphuric acid combine intensely. - potassium and oxygen flame in water; hydrogen is liberated. - phosphorus and iodine produce a flame. F. produced a table of “elective affinities” to demonstrate the relative reactivities of various compounds: in order: barytes (barium sulphate or barium carbonate), stronchia (strontium compounds?), potash, soda, lime, ammonia, magnesia.
Oct. 28	Tyndall	Steam engines (1)
Oct. 29	Frankland	Not stated
Oct. 30	Yeats	Pestalozzi contd.
Nov. 2	Yeats	Not stated
Nov. 3	Frankland	Botany, exogenous and endogenous conditions
Nov. 4	Tyndall	Steam engines (2)
Nov. 6	Yeats	The Papal States in Switzerland
Nov. 9	Yeats	Not stated
Nov. 10	Frankland	Chemistry. Proust was the discoverer of the definite proportions in which elements combined. He found that sulphuric acid combined with a base in the proportion 37.3 to 62.7. F. presented the combination proportions of a number of substances and showed, for example, the various oxides of manganese were formed in constant proportions.
Nov. 11-18	Frankland	Subject and date not stated
Nov. 11-18	Yeats	Subject and date not stated

Date	Lecturer	Subject
Nov. 17	Frankland	Atomic theory and the formation of crystals. Water, salt and saltpetre being mixed and evaporated to dryness remain distinct in crystalline form. Sulphate of copper and sulphate of ammonia on the contrary combine and crystallize together. F. defined atomic volume as specific gravity divided by atomic weight and provided the atomic volumes for hydrogen, nitrogen, chlorine and oxygen.
Nov. 18	Tyndall	Steam engines (3)
Nov. 19	Yeats	The Pawnee Indians
Nov. 22	Frankland	Oxygen: The lecture covered the proportion of oxygen in air; incidence of oxygen in minerals, chemical properties of oxygen, methods of preparing it and the types of flames produced by burning phosphorus, sulphur or iron wire in oxygen.
Nov. 24	Frankland	Oxygen contd. How plants reduce carbon dioxide – fixing the carbon and releasing oxygen: more methods of producing oxygen; Priestley and Lavoisier's work in overthrowing the phlogiston theory.
Nov. 25	Tyndall	Steam engines (4)
Nov. 29	Frankland	Hydrogen. F. described properties of hydrogen. It was first discovered by Cavendish who thought it was the "lightness principle" required for the phlogiston theory; how to make by passing water vapour over red hot iron filings. It must be dried to use in balloons as water vapour has a high specific gravity and would diminish the 'lift'. The gas has a high refractive index.
Dec. 1	Frankland	Hydrogen and oxygen. Principle of light from a gas jet; commercial production of coal gas; fun with soap bubbles filled with a mixture of hydrogen and oxygen – when lit with a match they explode like thunder; lime-lighting and the oxyhydrogen blow pipe.)
Dec. 2	Tyndall	Watt's life and experiments
Dec. 6	Frankland	Water. (no details)
Dec. 8	Frankland	Water contd. Impure water may be distilled by freezing as water has a higher freezing temperature than many soluble substances; for example, icebergs are not salty. Water may also be distilled by boiling off products which have lower boiling points or, if higher, by boiling off the water and condensing it.
Dec. 9	Tyndall	Steam engines (5)
Dec. 10	Frankland	Botany. Endogenous and exogenous plant structures
Dec. 11	Yeats	von Fellenberg. "Most interesting," noted Tyndall
Dec. 16	Singleton	Tyndall was ill. Singleton took his place.

Tyndall and Frankland had left for their vacation before John Yeats gave a final lecture for the year. It has not been included in the lecture totals.

Table A7.4*Evening lectures at Queenwood: Second term (January-June, 1848)*

Date	Lecturer	Subjects
Jan 17	Frankland	Chemistry and Botany: Discussed recent examinations
Jan 18	Tyndall	Steam engines
Jan 19	Frankland	Supply of water to towns: Tyndall reports that F. dealt with the hardness of water and estimated the savings to people in cost of soap if the hardness were reduced at the municipal level.
Jan 20	Henry Fawcett (stdnt)	The condition of agricultural labourers. [H.F. used shorthand notes.]
Jan 22	Yeats	Not stated
	Frankland	Jan 22. "Wrote out Syllabuses of my lectures on Chemistry and Botany for publication in <i>The Queenwood Reporter</i> ."
	Tyndall	Jan 23. Sun. "Inhaled chloroform after dinner, extraordinary effects, poor Tris was totally drunk."
Jan 24	Frankland	Irrigation and Drainage.
Jan 25	Tyndall	The expansion principle and the nature of steam, common and superheated
Jan 26	Frankland	Hydrogen peroxide and the preparation of nitrogen
Jan 27	Johnson Bailey (stdnt)	Not stated
Jan 28	Frankland	Present condition of the crust of the globe, the evidences that exist of its high antiquity and the modern date of man
Jan 29	Yeats	The Character of Admiral Earl St. Vincent
Jan 31	Frankland	Diffusion of gases and the constitution of the stratosphere
Feb 1	Tyndall	Parallel motion applied to steam engines
Feb 4	Yeats	Y. substituted for F. who at Mrs Edmondson's suggestion went to Southampton to accompany Jane Edmondson shopping! Jane explained Quakers to Frankland.
Feb 7	Frankland	<i>In London, presented his co-paper with Dr. Kolbe to the Royal Chemical Society</i>
Feb 9	Frankland	Ventilation and the aqueous phenomena of the atmosphere
Feb 10	Cockayne	The manufacture of plate glass
Feb 11	Frankland	Geology: its history; importance to commercial prosperity of a country; theories of deposition of strata; order of superposition, &c
Feb 14	Frankland	Nitrous oxide. F. had prepared a large quantity and made sure it was pure. "I tested two doses on myself", wrote F. At the lecture F. administered the nitrous oxide ['laughing gas'] to between 15 and 20 persons.
Feb 16	Frankland	Nitric oxide and hypo nitrous acid
Feb 18	Frankland	The technical terms employed in Geology; he illustrated meaning of a 'fault'"

Date	Lecturer	Subjects
Feb 21	Frankland	Nitrous acid
Feb 23	Frankland	Nitric acid: its properties and commercial preparation
Feb 25	Frankland	Composition and decomposition of granitic rocks
Feb 26	Frankland	<i>An examination on chemistry from 10am to 1pm.</i>
Feb 28	Frankland	<i>Presented results of the examination to his students.</i>
Mar 1	Frankland	Ammonia
Mar 3	Frankland	Ancient Volcanoes and Basaltic Rocks; endeavouring to establish the identity between Basalt and modern Lava.
Mar 6	Frankland	Amidogen (term used at that time for the NH ₂ radical) and Carbon.
Mar 8	Frankland	Two modifications of carbon; Graphite and Charcoal.
Mar 10	Frankland	The agencies at present modifying the earth's crust
Mar 13	Frankland	Coke and Animal Charcoal.
Mar 14	Tyndall	Steam engines
Mar 15	Cockayne	(F. busy for coroner with analysis of stomach contents of corpse thought poisoned by arsenic. He found a trace of arsenic but it came from a reagent. No proof the man had been poisoned.)
Mar 16	Frankland	Carbonic acid
Mar 21	Frankland	Carbonic oxide
Mar 27	Tyndall	Lectured on (railway) gradients
Mar 28	Frankland	Manufacture of town gas. First in Manchester, 1804
Mar 29	Tyndall comment	Carpenter's shop opened, with fete. "Diggery" (must be Yeats) spoke long and ultimately laid a thick coat of varnish on Mr Singleton, he puts me in mind of the bat of Surniam (Surinam) which sucks your blood but fans the wound.
Mar 30	Frankland	T. reports "heard Mr F lecture on the classification of animals"
Apr. 11	Frankland	SO ₂
Apr. 18	Frankland	SO ₃
Apr. 19	Frankland	Nordhausen, SO ₃ and hydrated sulphuric acid
Apr. 20	Frankland	Devonian rocks and the fossils found in them
Apr. 21		"Good Friday. Edmondson did not seem willing to give us a holiday without it being asked for as a favour. Wat and I determined not to have one on such terms and worked the whole day on our own account."
Apr. 25	Frankland	SH and S ₄ H ₂
Apr. 26	Frankland	SH, SH ₂ , Cl ₂ . Selenium and its compounds with O and S
Apr. 27	Frankland	The carboniferous system: shewed the order of superposition in England to be 5. Upper Coal Grits, 4. Coal measures, 3. Millstone Grit. 2. Carboniferous Limestone, 1. Lower Carboniferous shale
Apr. 29	Frankland	Chemistry exam 9am-3pm. Allowing half an hour for dinner

Date	Lecturer	Subjects
Apr. 30 (Sun)	F and T	Up at 4½. Miss J had set out goodly supply of food. Started at 5½, through Romsey, for Rufus' Stone at Stoney Cross, walking at 4½ miles per hour; arrived at Royal Oak at 10.20, refreshment, into forest to see monument. "This relic of bye gone ages exhibited as usual the disagreeable propensity of most Englishmen viz, the cutting, carving, scraping and writing of names upon the iron case and the surrounding trees. At the Inn was a transcription of the memorial: "Here stood the oak tree whereon an arrow (shot by Sir Robert Tyrrel) at a Stag glanced and struck King William 2 nd (surnamed Rufus) on the Breast, whereof he instantly died on the 2 nd day of August, 1100." The original memorial had been erected in 1745 but much defaced a more durable memorial was erected in 1841 (as noted, it in turn was defaced.) F and T walked 35 miles on this excursion, taking train from Romsey back to Dunbridge. They were not popular with the Edmondson's at tea on Monday, having been absent without leave.
May 3	Frankland	Phosphorus and phosphorus oxide. F. wrote "Mr Dawes called at Queenwood and gave me a copy of his 'Suggestive hints...'"
May 4	Frankland	Coal, lignite, etc.
May 8	Tyndall	"As Mr E would not be present - changed my mind and gave the lads half an hour on the steam engine."
May 10	Frankland	T. reports – "Heard Mr F on the combination of phosphorus and oxygen – mentioned preparation of PO ₅ and Lime for filling decayed teeth
May 11	Frankland	T. reports –Mr F on coal – recent Putney investigation into relative value of coals
May 22	Tyndall	The atmospheric system
May 24		After dispute by T about a <i>Reporter</i> article, T & F spent 2 hrs at Dog; (Greyhound Hotel) and returned "in a very undesirable condition"
May 25	Frankland	Magnesian limestone or Permian System and the Botany & Palaeontology of the newer Palaeozoic Period
May 30	Frankland	Methods in detection of arsenic
May 31	Frankland	Detection of arsenic, cont.
GAP in T. journal June 1-11		
June 12	Tyndall	Examined lads for several hours in maths and mechanics
June 14	Tyndall	Left school for summer holiday

Table A7.5

Evening lectures at Queenwood: First 3 months (26 July to 25 September) of first term, 1848-49)

Date	Lecturer	Subjects
July 26	J. Mansergh (stdnt)	Frankland noted, "Gave an account of his adventures in Lancaster"
July 31	Tyndall	"Gave my first lecture on physics." In his introduction T. describes the restless nature of man. Always seeking new knowledge; building systems of thought that another will change. F describes T lecture as on "the properties". "He very clearly explained what is meant by the terms – Extension, impenetrability, inertia, divisibility and attraction. He shewed mathematically the infinite divisibility of matter."
Aug 1	Frankland	Boron and boracic acid
Aug 2	Frankland	Remaining compounds of Boron. Silicon and silicic acid
Aug 3	Frankland	"Lectured on Electricity – a very bad lecture; explanations badly made and materials badly put together; also owing to the damp condition of the air all the experiments failed."
Aug 7.	Tyndall	F. described T's lecture on Matter and its Forces, "he spoke on the difficulty of defining matter, of its properties (as described above on July 31) and then went on to describe the attractions of cohesion and gravitation; he shewed the reason why a body weighs less at the top of a mountain than at the bottom, at the equator than at the poles."
Aug 9	Frankland	Manufacture of glass
Aug 10	Frankland	Atmospheric electricity
Aug 15	Frankland	Chlorine
Aug 16	Frankland	Bleaching and disinfecting properties of Chlorine
Aug 17	Frankland	Animal and thermal electricity
Aug 21	Tyndall	Radiation and Conduction of Heat
Aug 22	Frankland	Hypochlorous acid and its action in bleaching
Aug 23	Frankland	The bleaching of calico &c and printing in the discharge style
Aug 28	Tyndall	Light
Aug 27-31	F. sick with toothache	
Sept 2 (Sat)	Frankland	"Instructed Mr Dawes' assistant (from King's Somborne) in Chemical Manipulation most of day. Staff meeting to discuss class arrangements to be weekly – a republic is restored.
Sept 5	Frankland	Chlorous and chloric acids
Sept 6	Frankland	Hydrochloric acid
Sept 7	Frankland	Voltaic electricity

Date	Lecturer	Subjects
Sept 9 (Sat)	Frankland	Mr Dawes' assistant (from Dawes's elementary school in King's Somborne) in lab all day
Sept 13	Frankland	Iodine and its compounds with oxygen
Sept 15	Frankland	R. Galloway arrives (to replace Frankland)
Sept 16 (Sat)	Frankland	With Dawes' assistant for whole day
Sept 19	Frankland	Introduced R. G. to "farmers" and transferred them to his care
Sept 19	Frankland	Iodine and bromine
Sept 20	Frankland	Compounds of bromine; the Daguerreotype
Sept 21	Frankland	Effects of Voltaic electricity
Sept 22	Frankland	Had Mr Halstead (teacher from King's Somborne working in the lab.) He brought 40 (!) vols. of Goethe's works as a present from Mr Dawes
Sept 25	Tyndall	Last lecture to the boys

V.3 Frankland's examinations

Frankland exercised his second class on 23 March, 1848 with a test that took two one-hour lessons to complete. Frankland's answers indicated he taught his class to use atomic numbers which he referred to as "atomic weights." The questions were:

1. When 1 cwt of chalk is burnt how much Lime will it yield?
2. A limestone yielded 33 per cent CO₂. How much CaOCO₂ did it contain per cent?
3. A limestone gave 40 per cent CO₂. How much impurity did it contain?
4. 18 grs. of a limestone gave 7.5 grs.CO₂ and .8 grs Fe₂O₃. How much CaOCO₂ and FeO did it contain per cent?
5. A quantity of soil weighing 25 grs. gave 4 grs CO₂ and 7 grs. CaO; the excess of Lime existed in the soil as silicate; how much of this and also how much CaOCO₂ did the soil contain per cent?

Indicating how he used his lecture time to extend his class work, Frankland noted he "lectured in the evening on Carbonic Oxide." The next day he extended the test for the second chemical class with five exercises about the hardness of water and then lectured on the subject to show, for example, that municipal softening of water could save people the cost of a great deal of soap.

For his senior (third) class Frankland set a five and a half hour examination on 29 April, 1848, 9 am to 3 pm, allowing half an hour for dinner. It was noted in The Reporter that "no note books or other sources of information are allowed."

1. How many compounds does Nitrogen form with Hydrogen?
Describe the processes by which Ammonia is formed both naturally and artificially. State its properties and uses. (15 marks)

2. In how many forms is Carbon met with? What are the peculiar properties of Wood Charcoal and Animal Charcoal? (10 marks)
3. Describe the compounds of Carbon and Oxygen, their preparations and properties. What decomposition takes place in the burning of Lime? When 1 Cwt of Chalk is burnt how much CaO will it yield, the atomic weight of CaO being 28. (10 marks)
4. Describe the compounds of Carbon and Hydrogen. What is the difference between putrefaction and decay? (5 marks)
5. Into what compounds are C, H and N resolved during the processes of combustion and decay? (10 marks)
6. State the processes for the manufacture of Coal Gas, what are the principal bye products formed and to what uses have they been applied? (15 marks)
7. Whence is sulphur procured, and in how many forms is it met with in commerce? Give the processes of manufacture. (10 marks)
8. Describe the commercial methods for preparing SO₃ and state the uses to which it is applied. (15marks)
9. By what tests can NH₃, CO₂ and SO₃ be recognized? (10 marks)

Frankland listed in his journal for 10 June, 1848 the following questions as “a written examination on Chemistry from 9 a.m. to 3 p.m.” for his senior class. He allowed half an hour for dinner. The questions were also printed in *The Reporter* for 15 August, 1848.

- Q1. How is phosphorus prepared and what are its properties? (10 marks)
- Q2. Describe the compounds of phosphorus with oxygen and hydrogen. (10 marks)
- Q3. How many varieties of PO₅ are there? Give the formula of each. (10 marks)
- Q4. How is arsenic manufactured? Describe the compounds which it forms with oxygen and hydrogen. (10 marks)
- Q5. Describe the operations necessary for the detection of arsenic poisoning and state minutely the points of distinction between arsenic and antimony. (25 marks)
- Q6. What are the conditions necessary to the efficiency of an antidote? What is the best antidote for arsenic? Show by a diagram the mode of its actions? (15 marks)
- Q7. From what minerals is antimony obtained and how is the pure melted product prepared? (10 marks)
- Q8. Describe the methods of preparation and the properties of the compounds of antimony with chlorine, sulphur and hydrogen. (10 marks).

There was a third test for his Senior class during September, 1848

- Q1. In what form is silicon usually met with, and in what proportions does it combine with the other elements? (5 marks)
- Q2. How do silicates contribute to the fertility of soils? (10 marks)
- Q3. To what useful purposes have soluble alkaline silicates been applied? (10 marks)

Q4. Describe the processes employed in the manufacture of glass. What is the composition of flint, crown, bohemian and bottle glass? (10 marks)

Q5. Why is a mixture of two silicates necessary for a good glass? (5 marks)

Q6 Describe the processes employed in the preparation of chlorine gas. To what uses has it been applied? Give diagrams. (10 marks)

Q7. How does chlorination destroy noxious effluvia and miasmata? (10 marks)

Q8. State the processes used in the manufacture of bleaching powder; how is it employed in the arts [meaning industry]? Give an example of the manner in which the percentage amount of chlorine in any sample of chloride of lime may be determined? (10 marks)

Q9. How is muriatic acid procured, what are its properties, and by what simple process can its strength be ascertained? Give an example. (10 marks)

Q10. How is iodine prepared; what are its properties, and how can it be detected? (10 marks)

Q11. Whence is bromine procured and in what relation does it stand to chlorine, iodine and oxygen as regards affinity? (5 marks)

Q12. Give an outline of the processes employed in the production of Daguerreotype images. What is the probable action of light upon the prepared plate? (5 marks)

Frankland recorded the results of the three senior chemistry examinations listed above which he set during the second term, January-June, 1848. He did not list any “farmers” results because, as part of their mutiny, no “farmer” answered any question at the first examination.

Table A7.6

Results of senior class chemistry examinations set by Frankland at Queenwood College during January-September, 1848.

Place	Name	Exam 1	Exam 2	Exam 3	Total	Average %
1	E. Yates	95	95	91	281	93.7
2	A. Parkinson	93	65	92	250	83.3
	H. B. Spencer	72	81	97	250	83.3
3	Neville Clegg	80	98	68	246	82.0
4	William Paley	62	79	95	236	78.7
5	John Heys	57	87	91	235	78.3
6	Johnson Bailey	55	64	99	218	72.7
7	James Mansergh	83	36	97	216	72.0
8	James Paley	67	60	79	206	68.7
9	John Duckworth	75	69	53	197	65.7
10	Isaac Stevens	68	66	39	173	57.7
11	B. Crossley	76	34	49	159	53.0
12	M. Blackmore	39	27	77	143	47.7
Average		70.9	66.2	79.0		72.0

(Possible marks in each examination were 100. Averages prepared by author.)

Frankland did not confide explanations to his journal for inconsistencies in the marks of Parkinson, Mansergh and Crossley, nor for the decline in marks by Duckworth, Stevens and Crossley. It is also to be noted that Frankland's examining did not appear to measure up to the statement in *The Reporter*, 15 February, 1848, "Our pupils' progress will be tested by their ability, and not by their amount of knowledge." Frankland's questions in these three examinations called for a good memory and not for a display of practical ability. Possibly, Frankland did not record his assessments of the students' laboratory work where they may have exhibited their practical ability.

V.4 Frankland as seen by his friends

On Sunday 10 September, 1848 after tea at Queenwood four friends, Edward Frankland, John Tyndall, John de Haas and Kirke White gathered to play, "Definitions". They started by lampooning each other. Frankland apparently was intrigued by his friends' descriptions and copied them into his journal for that day:

Tyndall apparently worried about his friend's future, wrote:

- "Frankland - an idea which will be very dear to me, or very doleful;
- a petitioner in physical sciences who like the damsel at the Roman gate is in danger of being crushed by her bountiful response;
- the germ of a tree which may afford humanity fruit and shade, or else a bush with berries ornamental but unedible."

Kirke White saw Frankland as a scientist of enormous ability who was being exploited by the Edmondsons. He wrote:

“Frankland - An enormous intellectual elephant, the most curious of its kind. He had once when young a pound of gingerbread placed before it. Well, instead of satisfying natural desire and eating this it seems bound by a strange infatuation to count over its physical structure. Occasionally, it takes one little nut, but seems to consider this quite a sin. P.S. This elephant intellectual is a source of great emolument to its owners.”

John Haas admired Frankland’s enormous intellectual capacity. He wrote:

“Frankland -
A sponge of the most enigmatical composition, of sterling stuff,
always imbibing knowledge without ever getting full.”

V.5 The sensitivities of John Tyndall

Tyndall came to Queenwood in his twenty-seventh year. During his school days in Ireland he had taken an intense interest in mathematics, surveying, French language and English grammar. He had “the power of visualising relations in space” so that he had no need of models for solid geometry. (Eve & Creasey, 1945, pp. 3-4) He worked as a surveyor with the Irish Ordnance Survey then was transferred to Preston, Lancashire to work with the English Survey from which in 1843 he was fired for supporting staff claims for higher wages and better working conditions. Then twenty-three, he was “a gallant youth with a burning zeal against injustice and oppression.” (Eve & Creasy, p. 11) It was a year before he obtained work with a private surveyor’s office in Manchester which led him to extremely hard work surveying tracks for various railway companies. With a depression and railway work slackening in 1847, he followed a friend’s advice and applied to George Edmondson for a position of teacher at Queenwood College.

Tyndall was extremely sensitive in mind and imagination to things about him. In a letter to “My dear Children” (not his!) written in his first weekend he described how the misty view at night of the surrounding cultivated farmland, with its lumps of chalk inspired him to see a mystical chalk village around the school.

On Sunday, 24 October, 1847 Tyndall saw the Northern Lights which he watched for about half an hour during which “a lurid glare ... spread over the heavens ... (which appeared) ... to proceed from some enormous conflagration.”

(Then) it suddenly burst into indescribable splendour and for 15 minutes we enjoyed a scene the most magnificent that could be conceived, enormous fans of purple light flashed and quivered over half the horizon, all pointed to the zenith which resembled the apex of an umbrella shaking from its silky folds of ethereal beauty.

On Monday, 29 November, 1847, Davidson (the mathematics teacher), Frankland and Tyndall experimented with sniffing ‘sulphuric ether’. Tyndall described the effect:

I proceeded to inhale the vapour its first effect upon the lungs was disagreeable, but after a few trials and by gradually increasing the length of inspiration I inhaled it with ease and pleasure. The brick walls began to shine more brightly and to twist and quiver in sundry funny contortions, my brain became more ethereal, it seemed to have stepped out of its crust of earth and to use its power with entire freedom, now bounding up to the heaven and chasing Lescell's [Lascelle's] comet round the planet Jupiter, again descending upon a flowering earth where it revelled in most irrational delight. As I recovered I found myself gifted with an amazing volubility. I fancied I had hit upon some splendid discovery on the relations of mind and matter, and starting up I rapturously exclaimed 'I would not have missed it for a thousand guineas.' A walk to Broughton [a mile and a half downhill] set me all right, tho' the smell of the vapour clung to me tenaciously.

Tyndall was at ease with members of staff and school visitors, readily engaging them in discussions of religion or politics but he was sensitive to his relationships with the Edmondsons. For example, he was uneasy about the quality of his first evening lecture until the Edmondsons expressed their pleasure with hearing it. He was extremely hurt if Mrs. Edmondson and her daughter, Jane, the other members of the school editorial committee, disagreed with him. On 24 May, 1848, he had one such disagreement which so upset him he gathered Frankland for a two hour session at the local pub, which put each of them into "a very undesirable condition". Tyndall did not confide to his diary the detail which so upset him other than it related to an article submitted for the school *Reporter*.

On 15 May, 1848, Tyndall recorded extensive notes which in the RI archives appear as six closely typed pages. The notes are prefaced by the words, "preparing lecture" and the context indicates they were intended for a talk to the schoolboys. The following sub-headings are inserted to group Tyndall's notes. His talk was about science and social conscience.

On science

Science is built on a few general principles which anyone can grasp. Science moves forward on the basis of firm deductions. "She reduces the most stupendous operations of nature to the simplest mechanical experiments." To understand centrifugal force, we can go to a potter's wheel. We can understand optics when we think how our eye can record big landscapes. Nature's great experiment which produced "this enormous Hampshire chalk basin can be repeated in the laboratory by the smallest boy among you." The gigantic heavens have been charted; the path of comets can be followed. "The thunderstorm is but an enlargement of an electric spark."

A schoolboy and a scientist can each enjoy the sight of a rainbow but the scientist who understands the principles which permit a rainbow may use the principles for wider discoveries.

Limits to science

“Science seeks to establish general laws by which we may understand how our universe works. It cannot establish first or ultimate reasons for the existence of the universe.”

Use of information

“Every boy should read but must remain master of his reading. He should not adopt the opinions of others without thinking about what they write and seeking corroboration for the opinions he forms.”

Forming and holding convictions

“Some of you are reading *Chesterfield’s advice to his son* (which is) an elaborate treatise on politeness” but politeness must come from an inner feeling of kindness to others which, at times, might cause you to do something which might not be seen as correct etiquette. Your action might offend some but you will have a good conscience about it. You must follow the truth; not be constrained by what society thinks.”

Summary

Tyndall devotes his final page and half to a digression about his own boyhood and his belief that the world is moving asymptotically to perfection. One sentence expressed his message: “If I can only awaken in you a spirit of thoughtful, independent enquiry I shall care little if you remember my words or not.”

On Monday, 25 September, 1848, Tyndall gave a farewell talk to the school, which included his thoughts on education, the spirit of science and social conscience. His notes covered more than six pages of his journal. (Again, sub-headings are inserted to group Tyndall’s notes.) His talk was about education and social conscience. His notes start, “Lectured for the last time, gave the lads a sketch of my connexion with Queenwood and afterwards proceeded thus.”

The art of teaching

“We can only love (our students) and by making them love us, engage them to follow our example.”

Our method:

“We make ourselves walking chairs upon which their intellects lean until they learn to walk alone [...] As Johnson Bailey (one of his senior students) finds that he can manage quadratic equations and impossible roots as well as I can my sovereignty ceases [...] his next step will be beyond me [...] and then our relations are reversed. He becomes virtually my master.”

Your challenge:

“The higher you climb, the fewer are there to help you. You reach a summit and stand alone. You have no archetype to follow. You find you are not dependent on others. You realise “your ideal is a self-existent quality [...] this I believe to be the most important step in human education when we are able to shake away the sensuous part of our nature and to live a life of thought.”

Reason for learning science:

“I shall work hard there (in Germany) as a student of physical science [...] not for the mere purpose of playing with natural laws and compelling the rocks to tell me of what they are made, or summoning the stars of heaven to my study and extorting from them the secret of their motions [...] that would be committing words to memory regardless of their meaning. What are the sun, stars, science, chemistry, geology, mathematics but pages of a book whose author is God! I want to know the meaning of this book.”

Importance of religion:

Good thoughts, truth, impulses to do good come from God and He may be experienced from within yourselves. Listen to that inner spirit and be strong because elements in society will test you; they will “try to tie you to a stake like a donkey and thus cut off your pasture.”

Be independent of society dictates

“Enter society like free citizens.” Do not be bound by a society that would have you “throw away your boyish speculations and hopes of doing good.” Do not follow the thousands who would have you act as if you were saying: “I will screw down the poor to enable myself to appear respectable. I will insult the helpless, toady the powerful and lick the dust of a rich man’s shoe.” [...] “If we examine the claims of society to the power which it wields we shall see that it has no rightful claim at all, nor has it any power unless we choose to bestow it.”

Tyndall concluded his notes with an exhortation to the students to fit themselves for the task of “making some portion of society better than it is.”

John Tyndall and Edward Frankland departed from Queenwood College at the end of September, 1848 to seek their Ph.Ds. at Marburg University. (Refer Chapter 7) Each obtained his doctorate. Tyndall returned to Queenwood College in 1852 and left

before the end of 1853 to become a professor at the Royal Institution. (See Appendix to Chapter 9: N8, N9, N18.)

V.6 The Mutual Improvement Society

Tyndall speaking at the 1854 Royal Institute lectures on science in education presented a modern approach which John Dewey would surely have approved! Unlike the previous lecturers, he did not try to fit science into the classical carapace but accorded it its own domain as something natural, arising from the curiosity of the child.

Tyndall attacked classical education as laying down “a system of education which shall hold good for all ages” yet the “spirit of humanity” manifests itself in various forms depending on time and situations.” (RI, p.173) Effectively, calling on the Divine (“Nature’s manifest designs”) by which man gained the capacity to wonder, to think, to explain, it became man’s duty to exercise those capacities. (RI p.179) A classical education which ignores “our new continents of thought [...] unknown to the ancients [...] would be treason to the trust committed to us [...] to sacrifice the hopes and aspirations of the Present out of deference to the Past.” (RI, p. 181)

“Physics, said Tyndall, is a means of contributing to education defined as improving and developing mental faculties; it is an implement of culture not a branch of education the idea of which could lead to a static perception of Physics as an intellectual training device. Physics can contribute to intellectual development by aiding “the acquisition of specific knowledge and the ability to render it productive.” (RI. pp. 172-3)

Tyndall illustrates how a schoolboy urge for knowledge that physics could supply could arise and to some extent be satisfied informally. Without naming the school, he described the Queenwood College Mutual Improvement Society as consisting of “eighty to ninety boys, varying from eighteen to eight years” who would list questions for discussion with the other boys and masters who attended the weekly meetings.” Examples of the boys’ questions (RI, p. 183) were:

- What is frost?
- Why are thunder and lightning more frequent in summer than in winter?
- What occasions falling stars?
- If a towel be wetted with water, why does the wet portion become darker than before?
- Does the dew rise or fall?
- Is there more oxygen in the air in summer than in winter?
- What is the cause of perspiration?
- Is it true that men were once monkeys?
- What is the difference between the *soul* and the *mind*?
- Is it contrary to the rules of Vegetarianism to eat eggs?

Tyndall pointed out that many of these questions came directly from nature and represented a desire to find the cause of natural observations. “A number of teachers

were usually present, and they and the boys made common stock of their wisdom in furnishing replies.” That to Tyndall was education at work. Tyndall said that education should help boys get answers to their natural questions, not have their questions put aside in favour of centuries-old information which left the boys “in absolute ignorance as to whether the material world is governed by law or chance.” (RI, p. 189)

V.7 Staff during Edmondson’s years: 1847-1863

The following tables are fairly complete thanks to Tyndall’s and Frankland’s journal entries, Hirst’s journal entries cited by Brock (1996), the 1851 and 1861 population census entries for Queenwood College, the advertisements (Appendix to Chapter 9: N8, N15, N18, N28) in which Edmondson set out his staff details and news reports about lectures to local societies by staff members. There are gaps in the table where the writer has no information about the date on which a staff member resigned or his successor started, or whether in the interval another teacher came and went.

Edmondson died suddenly in May 1863. Unless staff had previously given notice that they would resign in June at the end of the school year it is surmised, they continued to December, 1863, the end of the autumn term. Certainly, this was the case for Débus who continued for the next four years with Willmore; probably also for Wright though he soon started his own school at Southsea and Haas who returned to Switzerland and opened a school.

Table 7:7 a

Queenwood College Staff in Edmondson's time: 1847 (Term 1) to 1850 (Term 2)

Staff	Subject	1847		1848		1849		1850	
		T1	T2	T1	T2	T1	T2	T1	T2
Davis, R.	Farm mngr	x	x	x	x	x	x	x	x
Frankland, E	Chem	x	x	x	*				
Tyndall, J	Phys	x	x	x	*				x
Davidson	Maths	x	x	x					
Singleton, J	English	x	x						
Yeats, J	Hist/Geog	x	x	x	x				
Haas, J	Mod. Langs		*	x	x	x	x	x	x
Cockayne	Chem		*						
Morton	?		x	x					
Cartwright, J	Music		x	?					
Taylor, H	English								x
Wright, R	Maths								x
Galloway, F	Chem			*	x				
Baker, G	Music					x	x		
Wilkins, S	Maths								
Cornwall, W	Music								x
Debus, H	Chem						x	x	x
Iliff, F	English								x
Mummery, J	English & Classics								x
Hirst, T	Maths & Ph								x
Smith, F. R.	Physics								

Brightwell, D	Surveying								
Trevor, Wm	Surveying								
Hughes, D	English								

Table 7:7 b*Queenwood College Staff in Edmondson's time: 1851 (Term 1) to 1854 (Term 2)*

Staff	Subject	1851		1852		1853		1854	
		T1	T2	T1	T2	T1	T2	T1	T2
Davis, R.	Farm mngr	x	x	x	x	x	x	x	x
Frankland, E	Chem								
Tyndall, J	Phys	x	x			x	x		
Davidson	Maths								
Singleton, J	English								
Yeats, J	Hist/Geog								
Haas, J	Mod. langs	x	x	x	x	x	x	x	x
Cockayne	Chem								
Morton	?								
Cartwright, J	Music								
Taylor, H	English	x	x	x	x	x	x	x	x
Wright, R	Maths	x	x	x	x	x	x	x	x
Galloway, F	Chem								
Baker, G	Music								
Wilkins, S	Maths								
Cornwall, W	Music	x	x	x	x	x	x	x	x
Debus, H	Chem	x	x	x	x	x	x	x	x
Iloff, F	English	x	x			x	x		
Mummery, J	English & Classics	x				x			
Hirst, T	Maths & Ph	x	x	x		x	x	x	
Smith, F. R.	Physics								
Brightwell, D	Surveying								
Trevor, Wm	Surveying								
Hughes, D	English								

Table 7:7 c*Queenwood College Staff in Edmondson's time: 1855 (Term 1) to 1858 (Term 2)*

Staff	Subject	1855		1856		1857		1858	
		T1	T2	T1	T2	T1	T2	T1	T2
Davis, R.	Farm mngr	x	x	X	X	X	X	X	X
Frankland, E	Chem								
Tyndall, J	Phys								
Davidson	Maths								
Singleton, J	English								
Yeats, J	Hist/Geog							x	
Haas, J	Mod. langs	x	x	x	x	x	x	x	x
Cockayne	Chem								
Morton	?								
Cartwright, J	Music								
Taylor, H	English	x	x	x	x	x	x	x	x
Wright, R	Maths	x	x						
Galloway, F	Chem								
Baker, G	Music								
Wilkins, S	Maths								
Cornwall, W	Music	x	x	x	x	x	x	x	
Debus, H	Chem	x	x	x	x	x	x	x	x
Iliff, F	English								
Mummery, J	English & Classics								
Hirst, T	Maths & Ph								
Smith, F. R.	Physics			x	x	x	x	x	x
Brightwell, D	Surveying							x	x
Trevor, Wm	Surveying							x	x
Hughes, D	English								

Table 7:7 d

Queenwood College Staff in Edmondson's time: 1859 (Term 1) to 1862 (Term 2)

Staff	Subject	1859		1860		1861		1862	
		T1	T2	T1	T2	T1	T2	T1	T2
Davis, R.	Farm mngr	x	x	x	x	x	x	x	x
Frankland, E	Chem								
Tyndall, J	Phys								
Davidson	Maths								
Singleton, J	English								
Yeats, J	Hist/Geog								
Haas, J	Mod. langs	x	x	x	x	x	x	x	x
Cockayne	Chem								
Morton	?								
Cartwright, J	Music								
Taylor, H	English	x	x	x	x	x	x	x	x
Wright, R	Maths								
Galloway, F	Chem								
Baker, G	Music								
Wilkins, S	Maths								
Cornwall, W	Music								
Debus, H	Chem	x	x	x	x	x	x	x	x
Iliff, F	English								
Mummery, J	English & Classics								
Hirst, T	Maths & Ph								
Smith, F. R.	Physics	x	x	x	x	*			
Brightwell, D	Surveying	x	x	x	x				
Trevor, Wm	Surveying	x	x	x	x				
Hughes, D	English	x	x	x					

V.8 References Appendix V

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Appendix VI QUEENWOOD ADVERTISING, NEWS AND PROMOTION FROM DIGITAL NEWSPAPER ARCHIVES 1847-1863

VI.1 Use of digital newspaper archives

To examine Edmondson's advertising, promotion and school news the author initially searched newspapers which covered the school's three "catchment" areas. First, Edmondson wanted to retain students from his previous school in Preston, Lancashire, and continue to attract students from the north where his name had been known for twenty years or more. Appropriate newspapers selected were *Lancaster Gazetteer* (Edmondson's home town), *Blackburn Standard* (town of Edmondson's first schools), *Preston Chronicle* (town of Edmondson's recent school) and newspapers which covered Lancashire's principal cities, such as the *Liverpool Mercury* and *Manchester Times*. The second important area was the one to which he had moved. This was the triangle formed by the cities of Winchester, Salisbury and Southampton. In his advertisements Edmondson located the school as "Nr. Stockbridge, Hants." and/or by reference to the Dunbridge Railway Station which was four miles from the school. The local newspapers selected were *Hampshire & Portsmouth Telegraph* and the *Hampshire Advertiser*. The third was the very large area to be developed along the south coast and directly to London and to Bristol and Wales. Accordingly, newspapers based in those areas were also searched: the *Bristol Mercury*, *Pall Mall Gazette*, *Morning Post*, *The Times London*, *The Sunday Times* and the *Times Educational Supplement*.

The newspaper searches were conducted on-line through digitised newspaper archives which were accessed at the State Library of Victoria, Australia, mostly during 2012 and 2013 and with further checking in 2014 of Willmore's period: 1864-1896. The sources included the *19th Century British Library Newspapers: Parts 1 and 2, 1800-1900*; *Illustrated London News Historical Archive: 1842-1903*; *Sunday Times Digital Archive: 1822-1906*; *The Times London Digital Archive: 1788-1908*; *Times Literary Supplement Historical Archive: 1802-1909* and *Gale NewsVault* which included the *19th Century British Library Newspapers: Parts 1 and 2* and the digitised archives of *The Times London*, *The Sunday Times*, *The Times Literary Supplement* and *The Illustrated London News*. *Gale NewsVault* offered the most comprehensive coverage at the time but was troublesome to use.

VI.2 Edmondson's Advertising, News and Promotion: 1847-1863

Edmondson's promotion was of three types. His first was to prompt readers' name recall and recognition with one or two line announcements in the Education sections of newspapers' classified advertising with such lines as: "Friends and students of Queenwood College are reminded the school will resume for second term on 17 January." It did not seem productive to detail this type of advertising. His second type, in longer advertisements, presented the school situation and curriculum, provided news about forthcoming school events such the end of term summer concert and detailed staffing, fees and teachers' academic experience which other private schools in the Hampshire-Southampton-Portsmouth region could not match and seldom referred to in their advertising. The third type was "public relations" in the form of journalists' articles clearly stimulated by interviews with Edmondson and which appeared in the local and national press. Advertisements of these second

and third types greatly extended hitherto available information about the history of Queenwood College and its teachers.

Items cited in the following pages are identified as N9.1, N9.2, N9.3, etc.

N9.1. 1847: First announcement of Queenwood College, and farewell to Tulketh

The following advertisement appeared on Saturday May 1, 1847 in *The Bristol Mercury*, *The Preston Guardian* and *The Hampshire Advertiser & Salisbury Guardian*. The advertisement was repeated in *The Manchester Times and Gazette*, Friday, May 7 and Saturday May 22; *Hampshire Telegraph and Sussex Chronicle*, Saturday, May 15; *The Hampshire Advertiser & Salisbury Guardian*, Saturday May 15, 22 and 29; *The Bristol Mercury*, Saturday May 22. In this advertisement Edmondson follows the Quaker practice of avoiding the pagan names of months and days.

QUEENWOOD COLLEGE

Tulketh Hall, near Preston, Lancashire

4th mo, 23rd, 1847

HAVING VERY GENERALLY ANNOUNCED HIS INTENTION OF CHANGING HIS PRESENT RESIDENCE FOR A MORE EXTENSIVE ONE, AT THE CLOSE OF THE CURRENT HALF YEAR,

George Edmondson

Wishes to lay before his Friends, and all who are interested in the subject of Education, the capabilities of his new Establishment, QUEENWOOD COLLEGE, near Stockbridge, Hants, and the plans and objects which he purposes to pursue there.

The possession of a Farm of upwards eight hundred acres, the assistance of an experienced and competent Farm Superintendent, and of a talented resident Chemist, with a well-appointed laboratory, enable him to offer many advantages to those wishing to study the science and practice of Agriculture. In Civil Engineering, he will be able to give a complete course, both office and field work, comprehending railway surveying and levelling, setting out railway curves and laying down gradients, land and estate surveying, specifications, estimates, making out plans, sections, specifications, estimates, &c., the construction of roads, canals, bridges, &c.

Natural and Experimental Philosophy will hold a prominent place in the plan of instruction, a valuable collection of electrical, pneumatic, galvanic, magnetic, and mechanical apparatus being provided for the use of the lecturers and their pupils.

At the same time, it is not G. E.'s intention to confine himself to these branches of instruction but to furnish a good classical, mathematical, and commercial Education; and, in addition, to provide competent professors of Painting and Modern Languages

G. E.'s terms are Fifty Guineas per annum, payable half-yearly, in advance, for every advantage of the College, including stationery.

Especial attention will be paid to Religious Instruction and the study of the Holy Scriptures.

Till the 20th of 6th mo., application for the admission of Pupils, or for further information, may be made to G. E., Tulketh Hall, near Preston, Lancashire.

Altogether, the advertisements covered Edmondson's present Lancashire constituency, the principal port and city of Bristol and the southern triangle of Salisbury, Winchester and Southampton in which the new school was situated. Later, Edmondson extended his advertising to include London newspapers as the number of his students from the north diminished and the centre of gravity for his students' homes moved south. Edmondson moved quickly to find successors for Tulketh Hall and by Saturday, June 19, he was able to place this advertisement in the *Preston Guardian* to introduce the new incumbents to the public

N9.2. 1847: New owners of Tulketh Hall School

TULKETH HALL ACADEMY
NEAR PRESTON

On retiring from his duties at Tulketh Hall, GEO. EDMONDSON takes the opportunity to introduce Dr. SATTERTHWAITE AND WILLIAM THISTLEWAITE to the favourable notice of his numerous friends. The distance to which he is himself about to remove must necessarily deprive him of several of his present pupils, to the friends of such, as well as those not immediately connected with him, G. E. wishes to recommend his successors.

The advertisement continued with his successors' announcement that their curriculum would be "liberal and comprehensive", "thorough and extensive". It would include: Greek and Latin, principal European languages, mechanical and ornamental drawing, mathematics and weekly lectures on a systematic plan, to communicate, in the course of the year, a wide range of information in general science.

This combined advertisement was repeated during September, October, November and December 1847 in Lancashire, Hampshire and Belfast newspapers.

N9.3. 1848: Advertisement for beginning of 1848-49 school year:

The following advertisement appeared in the *Hampshire Advertiser* for 15 and 22 July, 1848. As Tyndall and Frankland were leaving at end of September, 1848 and Frankland's replacement, Robert Galloway, as yet an unknown force, possibly explained why Edmondson mentioned no staff names. This advertisement contained messages which, perhaps, weakened the opening message that this was a unique establishment with respect to the educational outcomes it offered. How would prospective parents without explanation have interpreted the idea of eight year olds in the same establishment as men of 25? Considering the hard lines between members of the Established Church and the dissenters, could parents think a Quaker-led school would adequately attend to the spiritual needs of Church of England children? And could a Quaker school syllabus which excluded what to Quakers were pagan languages and pagan history, then requirements for admission to Oxford and Cambridge universities, adequately prepare students for the professions? Edmondson is careful to use the words, "professional life," not "professions". And what, at that time, might have been the connotation of "natives"? Edmondson, at the beginning of Queenwood's second year seemed uncertain about his message.

QUEENWOOD COLLEGE, STOCKBRIDGE, HANTS

(Dunbridge station, Salisbury Branch, London and South-Western Railway)
For Agriculture exclusively, or for Civil Engineering, for Commercial or Professional Life, will RE-OPEN July 25th, 1848.

An estate of nearly 800 acres, the whole under cultivation, a well-fitted-up Laboratory, extensive Philosophical Apparatus, Workshops, Gardens, Gymnastic Grounds, &c. afford every facility for giving Youth an education in harmony with the requirements of the age. French and German are continually spoken in the Establishment by natives. The staff of Teachers, English and Foreign, is numerous. The pupils vary in age, according to their pursuits, from 8 to 25, and attend, at the option of their parents, either the services of the Established Church, or that of Dissenting Chapels in the neighbourhood of Queenwood.

Terms, including extras, Fifty to Sixty Guineas per annum, payable half-yearly in advance.

For Prospectuses, and further information, apply to GEORGE EDMONDSON, address as above.

Variations of this advertisement were used during 1850-51, principally in the *Hampshire Advertiser*, *Hampshire Telegraph*, *Preston Guardian* and occasionally in the *Blackburn Standard* or *Manchester Times*.

N9.4. 1848-49: National publicity

On September 30, 1848 and again on January 13, 1849 Edmondson and Queenwood College were featured in *The Illustrated London News* in a series of articles about agricultural colleges. The January 13 article which appears below was reprinted with acknowledgement in the *Manchester Times* for 10 February 1849 and in the *Preston Guardian* for May 19. It read as follows:

About four miles from the Dunbridge Station, on the line from Bishopstoke to Salisbury, stands this handsome building, to the present uses of which we made allusion in a leading article in this Journal of September 30th last. We mentioned, in writing on the subject of Agricultural Colleges, and the advantages they afforded to this country, that Queenwood College was one of them. The statement however requires a little explanation, as Queenwood is not an exclusively agricultural seminary, but a college in which every branch of education is taught; and which, in addition to the usual course of classical and commercial study, provides, on a farm of 800 acres, for such young men as wish to turn their attention to agriculture, an opportunity to make themselves acquainted with it both practically and scientifically. Its principal - who was employed in Russia by the Emperor Alexander, in the reclamation of waste lands around St. Petersburg - is not merely an agriculturist, but an experienced teacher, who is imbued with a deep consciousness of the importance of school as an introduction to life. The celebrated establishment of M. de Fellenberg, at Hofwyl, is the model, to a great extent, of Queenwood College, as far as the principles on which it is conducted are concerned. Like M. de Fellenberg, the principal of Queenwood is of the opinion that the first business of an educator is to develop the various faculties of the youthful mind fully and harmoniously, and the next is to give these faculties a proper training, with strict reference to the future destination in life of the pupil. We

have not space, however, to enter at length on this subject; but, having set ourselves right on the point of agriculture, must confine our notice of Queenwood, as a public seminary, to the fact, that it is one of a kind of which we should rejoice to see many in England. The building itself [of which an engraving appears that occupies 5/11^{ths} of the article space] was constructed under the superintendence of Mr. Robert Owen, and is in fact the famous “Harmony Hall,” where that philosopher, if such he may be termed, attempted to carry out on a small scale his views for the regeneration of society, and to establish the Millennium. On the gable of the building appears the inscription, inlaid with flints, “C. of M., 1842.” On enquiring the meaning, we were informed that it signified “Commencement of the Millennium, 1842.” The Owenite Millennium, however, was of but small duration. The disciples consumed more than they produced – disputes arose – Harmony became inharmonious, and the fine building and farm on which large sums had been expended, became an unprofitable speculation. The result was that the establishment was broken up for the benefit of its creditors – that the brethren were dispersed and Harmony Hall was shut up, and remained for a considerable time without either a tenant or an offer. Ultimately Mr Edmondson, of Tulketh Hall, near Preston, was induced to take a lease of it, to carry out on a more extended scale the educational principles for which he is celebrated and has so successively wrought out in the former establishment. He restored the ancient name of the farm, and under his auspices Queenwood College promises to be one of the most valuable seminaries in the kingdom.

Edmondson frequently inserted short advertisements of one or two lines such as: QUEENWOOD COLLEGE, near STOCKBRIDGE, Hants. will resume for the ... term on (date). These reminder advertisements are not listed in these notes. Here follow details of Edmondson’s more informative advertisements about the college staff and facilities.

N9.5. 1851. Appeal to emigrants

QUEENWOOD COLLEGE
NEAR STOCKBRIDGE, HANTS
(Dunbridge Station, Salisbury Branch, South Western Railway)
For Agriculture (Farm 800 acres), Civil Engineering, and Practical Chemistry,
and for Classics, Scientific and Commercial Education.
See Prospectus, to be had of GEORGE EDMONDSON, Principal
The attention of Young Men about to Emigrate is especially invited to this
Establishment.
The first Session of 1851 will commence on the 16th inst.

In January 11, 1851 Edmondson introduced in the *Preston Guardian* an interesting variant to the N9.3 advertisement, possibly in response to advertising at the time seeking immigrants to Cape Colony, South Africa. He repeated this advertisement in the *Hampshire Advertiser* of July 05, 1851.

N9.6. 1851: Staff public lecture

The *Hampshire Telegraph* for January 25, 1851 noted that the Romsey Mutual Improvement Society had received a lecture on Tuesday last from “Mr. Yeats of

Queenwood College ... embracing an historical sketch and progress of the working class in Great Britain.”

N9.7.1851: College name in irrelevant news

The *Hampshire Advertiser* for April 12, 1851 carried a rather forced note which included the phrase, “within a hundred miles of Queenwood College” – perhaps the hand of Jane or Anne Edmondson? Under the head of “Romsey”, a town near Queenwood College, the Advertiser reported that:

a person who lives within a hundred miles of Queenwood College, took three days, two of thought and one of action, to complete the Census Household Schedule (in the recent Population Census of March 31). With only self and wife living at home, he misunderstood the instruction ‘that this is a correct return of all the members of this family’. He added details of all children, whether or not living at home, their workplaces and domiciles.

N9.8. 1852: Tyndall returns; 1852 staff

Anticipating the return of John Tyndall together with Heinrich Debus who Tyndall had recruited at Marburg, Edmondson announced in the *Preston Guardian*, January 3 that staff for the first session of 1852, starting on 15th January, would include:

Maths and Nat Phil: J Tyndall, esq., PH.D, Foreign Member of the Physical Society, Berlin
 Chemistry: H. Debus, esq., PH.D., late Chemical Lecturer and Assistant, in the Laboratory of Professor Bunsen at Marburg
 Mod Languages: J. Haas from Fellenberg etc
 Geodesy: R. P. WRIGHT
 Painting and Drawing: R. P. Wright
 Classics – (blank)
 Eng Lit: H. Taylor, late Pupil of Fellenburg

Edmondson repeated this advertisement in the *Preston Guardian*, January 10, and the *Hampshire Advertiser*, March 27 and April 03.

N9.9. 1852: Public lecture by Tyndall

Tyndall was soon in demand. The *Hampshire Advertiser* for April 03 reported that “last Tuesday, Dr. Tyndall of Queenwood College delivered the last lecture of the season to the Salisbury Young Men’s Improvement Society.”

N9.10.1852: National publicity

Queenwood was favoured in 1852 with considerable publicity as several newspapers carried unacknowledged extracts from the *Illustrated London News* article of January 13, 1849, together with up-to-date College news. Covering Edmondson’s birthplace, the *Lancaster Gazette*, May 22, 1852, quoted from the *Hampshire Independent* an article from which the following extracts are taken:

We have much pleasure in publishing the following account of the above establishment, furnished by a correspondent who has recently visited the

place. This narrative ... made capabilities of this fine institution more generally known.

Queenwood College was built under that extraordinary man, Robert Owen, the head of Socialists in this country who expended a sum of forty thousand pounds in erecting a splendid mansion and in bringing the surrounding land into a high state of cultivation. In accordance with Mr. Owen's theory, external circumstances were to be so arranged that want and wickedness should disappear and the Golden Age revisit the earth. The experiment failed, as all experiments must fail wherein the religious wants of man are ignored. The community was dispersed, and the house, farm, and appurtenances, fell eventually into the hands of the present spirited proprietor, Mr George Edmondson, who is a member of the Society of Friends. Queenwood stands nearly midway on the straight line from Salisbury to Winchester. The Roman road connecting both cities passes through the estate. It is four miles distant from the Dunbridge Station of the South-Western Railway, and a three hours' journey from the Waterloo Terminus, London. Its situation is most salubrious, the air is pure and dry, and its general healthfulness, indeed, is well attested by the rarity of physicians' visits.

The article concluded with a description of Queenwood's junior and senior school departments.

N9.11.1852: New gas lighting

The *Blackburn Standard* covering the town in which Edmondson established his first schools, on May 26, 1852 carried an article identical in its opening paragraphs with those in the above Lancaster Gazette about the "correspondent who had recently visited the place" and the community origin and collapse under Robert Owen. The article added the following information.

Attached to the school is a large and breezy playground, in one angle of which an extensive gymnastic apparatus is erected. The pupils work hard in class, but the attention paid to their physical education out of doors combines with the natural healthfulness of the place to keep them vigorous and happy. The domestic arrangements are admirable; I was particularly struck with the tasteful and substantial manner in which the house is furnished, the arrangements for thorough ventilation, the snow-white purity of the bed furniture and the quite and good order everywhere manifest. On approaching the establishment by night, the visitor is greeted by a cheerful light, which proceeds from the windows and approaches to the mansion, and imparts to the place an air of indescribable comfort. The College has its own gas works, from which pipes ramify through the whole concern. The gas is what is termed "White's Hydrocarbon Gas," a combination of gas obtained from water with that obtained from the richer cannels during carbonisation. The light is a very brilliant one, yet soft and pleasant to the eye. I was interested to learn that by this method 12,500 cubic feet per ton had been obtained at Queenwood from Sunderland coal, but that a Scotch cannel [seam of coal] is now made use of there, which produces the enormous quantity of 45,000 cubic feet per ton. The scenery in the neighbourhood of Queenwood is remarkably beautiful, and the estate is intersected by a magnificent avenue of ancient yew-trees, which

interlace their *sombre* branches overhead, and present the appearance of a solemn cathedral aisle, in which the songs of the thrush and the nightingale are substituted for the peal of the organ. To me, fugitive from the noise and dinginess of a great city, this visit has been full of enjoyment, as the memory of it is full of pleasure; and to anyone interested in these matters, and wishful to spend a day profitable and pleasantly, I would strongly recommend a trip to this interesting place.

N9.12.1852: Gas lighting repeated

The *Manchester Times* for May 29, 1852 carried the same article as that in the *Blackburn Standard*, three days previous. The coincidence of dates and content suggest that the three newspapers took their material from a common source, the *Hampshire Independent*.

N9.13. 1852: College summer concert

At this period, the Queenwood school year was divided by a Christmas-New Year break and a summer holiday into half-year sessions. Queenwood developed a tradition of an open-house concert just before the summer holiday. This report in the *Hampshire Advertiser*, July 10, 1852 shows that Tyndall had indeed returned with a big bang.

QUEENWOOD COLLEGE.- The half-yearly examination of pupils educated at Queenwood College took place on Monday se'nnight. The progress the pupils had made during the preceding six months reflected great credit on the students well as the teachers. The performance of vocal and instrumental music under the direction of Mr. Cornwall, the teacher of music at the establishment, gave great satisfaction. Dr. Tyndall delivered a lecture on Electro Magnetism, in which he introduced some highly interesting experiments. Among many others were, the decomposition and recombination of water by the electric fluid, the evolution of chlorine, the grand bleaching agent, from common salt dissolved in very dark litmus coloured fluid, the latter becoming colourless as the chlorine was evolved. That wonderful phenomenon, the electric light, was exhibited, and not a little amusement was created in witnessing the firing of a battery of cannon placed on the lawn at some distance from the College, the circuit being completed by a young lady at the lecture table. After the lecture the company adjourned to the large dining hall, to partake of an elegant supper which had been provided by the kind hospitality of the excellent hostess. Queenwood College was once denominated Harmony Hall, and *discord* led to the dispersion of its inmates. Robert Owen and his followers here expended a sum of forty thousand pounds in endeavouring to realise a delusive dream, but failed in their attempts. The society was broken up, and the noble mansion which Owen had erected, the fields he had tilled, and the grounds he had ornamented, passed into the possession of the present proprietor, Mr George Edmondson, who devotes them to wiser and more practical purposes. Owen displayed great discrimination in the selection of his Utopia, as a healthier spot could scarcely be found. The educational institution comprises two departments entirely distinct. In the one, boys are educated for professional or commercial pursuits:

in the other, agriculture is practically taught, and an excellent laboratory, together with a farm of 800 acres, are found to be valuable auxiliaries to the branch of study.

The repetition of phrases supporting the legend of Edmondson as the saviour of Harmony Hall from the godless socialists in this report and in N8-N11 suggest a single source – a sympathetic newspaper reporter or, perhaps, Edmondson’s publicity team of wife and daughter – who appeared to seize every opportunity to publicise the College and emphasise the Edmondson “saviour” legend.

N9.14.1852: Public lecture

The *Hampshire Advertiser*, September 25, 1852 reported that J. Haas of Queenwood College lectured at the Southampton Polytechnical Institute.

N9.15.1852: Queenwood staff for 1853

The final College advertisement for the year appeared in the *Hampshire Advertiser* issues for December 11 and 18. It listed the staff for the next term, starting on January 20, 1853, and followed the same format as N6:

Maths and Nat Phil: J Tyndall
 Chemistry: H. Debus
 Classics and History: Mr. Prout
 Modern Languages and Foreign Lit.: John Haas
 Geodesy: Richard P. Wright
 Painting and Drawing: R. P. Wright
 English and Junior Maths: Mr. Benjamin Hough
 Music: William Cornwall
 Farm Superintendent: Mr. Richard Davis

There was little publicity of note in 1853.

N9.16. 1853: Tyndall public lecture

The *Hampshire Advertiser* of February 14, reported that on February 11, Tyndall “delivered a lecture on ‘Light and Electro Magnetism’, highly illustrated by experiments” to the Southampton Polytechnic Institute.

N9.17. 1853: Advertisement in *The Times*

In July, Edmondson placed a four-line advertisement in *The Times*, London, July 26 which gave his address for a prospectus and stated the date for the beginning of second term.

N9.18. 1853 College staff for 1854

In the *Bristol Mercury*, December, 31, Edmondson announced his staff for 1854.

QUEENWOOD COLLEGE
 NEAR STOCKBRIDGE, HANTS
 Principal- Geo. Edmondson
 - Mathematics and Natural Philosophy:

Dr. Thos. A. Hirst, of the Universities of Marburg and Berlin
 -Chemistry: Dr. Heinrich Debus, late assistant in the Laboratory of Professor Bunsen, and Chemical Lecturer in the University of Marburg
 -Classics and History: Mr John S. Mummery, L.C. P.
 -Modern Languages and Foreign Literature: Mr John Haas, from M. de Fellenberg's Institution, Hofwyl, Switzerland
 -Geodesy: Mr Richard P. Wright
 -Painting and Drawing: Mr. R.P. Wright
 -English and Junior Mathematics: Frederick Illiff, M. A., late scholar of Trinity College, Cambridge and M.C.P.
 - Ditto: Mr William Singleton
 - Music: Mr William Cornwall
 Terms: Boys under 12, £40 p.a. 12-16, £50, Over 16, £60
 The first session of 1854 commences on the 20th of January

Compared with the previous year's list (N14), Tyndall has left to be a Professor at the Royal Institution and has brought in his friend Thomas Hirst to replace him. Prout and Hough have left but three have come to replace them: Mummery, Iliff and William Singleton – surely Anne Edmondson's brother, forgiven for whatever disgrace caused Edmondson to sack him in 1848 – but earning only a “ditto” in the advertisement. Important for the stability of any school Edmondson was now gaining a solid core for his staff with Debus, Haas, Wright and Cornwall, and Richard Davis, who has been managing the farm since 1846 and continued, according to Royle (p. 222), until 1885.

Brock (p.14) reported that Queenwood had 76 students in 1853.

Mummery in November, 1953 had “purchased a German doctoral degree for £25” and, presumably, started to refer to himself as “doctor”. Hirst, according to Brock (p. 15) threatened to expose Mummery to parents and persuaded Edmondson to dismiss him. Not deterred by his sacking, Mummery opened a school in Uxford, near London, and unless he had completed a doctorate in the meantime, he continued falsely to describe himself as “Doctor” and ambiguously, as “member of Council” of Queenwood? This was Mummery's advertisement in *The Times*, January 01, 1857.

IVER GRAMMAR SCHOOL, near Uxbridge (Great Western), conducted by Dr. MUMMERY, M.A., L.C.P., First Greek and Latin Prizeman of 1852, member of Council and formerly Classical Master at Queenwood College, Hants. Term 22-28 guineas. Duties will commence January 16.

N9.19. 1854: Hirst's unsuccessful public lecture

1854 was not notable for Queenwood College advertising. The *Hampshire Advertiser* for February 25 reported that on the previous Monday evening at the Salisbury Literary and Scientific Institute:

Dr. Hirst of Queenwood College, delivered a lecture on “Electricity and Magnetism”, but lectures of this kind do not appear to be popular in Salisbury, and the lecture was not so well attended as it deserved to be.”

Perhaps, it was not the fault of the good members of the Salisbury Institute as Brock (1996, p. 14) cited Hirst's *Journal* for 30 October, 1853 to the effect that Hirst had discovered “he lacked the talent ever to shine as a popular lecturer”.

N9.20. 1854: Christmas concert

At the end of the year, The *Hampshire Advertiser* for December 23, 1854, reported that:

on Monday last, the Queenwood College Christmas Concert attracted one of the most numerous audiences which the spirited proprietor of Queenwood has yet assembled at its joyous holiday celebrations. The concert room was fitted with exceeding taste and flooded with gaslight. ... [There was] a high standard performance of Mozart, Mendellsohn and other great masters... The singing of Master Dunville deserves special notice... repeatedly encored ... and that all ... reflects great credit on Mr Cornwall, the musical preceptor of the College. The reporter also noted that thanks to performers was given by Rev Stanlake Lee of Broughton and that "Professor Tyndall (of the Royal Institution) followed highly eulogising the candour, sincerity, and honest devotedness to their profession on the part of the preceptors at Queenwood.

Behind the scenes of this festival of light and jollity, at the end of 1854 Iliff left the school. He had resigned at the school's internal chaos. Brock (p.18) cited Hirst's journal for 23 April 1854 to the effect that "Iliff had decided to quit because, expecting to find Queenwood a 'model place' had found it was 'conducted by an imbecile, and that its success is not owing to, but in spite of, [Edmondson's] management." Brock also cited Hirst's journal for 26 November, 1854, in which Hirst referred to Edmondson as "a foolish little man, a thick-skinned, acrid blockhead."

N9.21.1855: Short advertisements

During 1855, when the Crimean War was at its height, Edmondson used a small, three-line advertisement which first appeared in the *Hampshire Advertiser* for January 13, 1855.

QUEENWOOD COLLEGE, NEAR STOCKBRIDGE, HANTS.
Prospectuses may be had on application to GEO. EDMONDSON, Principal.
The First Session of 1855 will commence on the 25th of January.

During the year Edmondson repeated this advertisement, with appropriate changes to date of school term, in the *Hampshire Telegraph* (June 23, 30, July 7, 21) and in the *Bristol Mercury*, June 30.

N9.22.1855: Ten teachers' advertisement

Edmondson's second advertisement for the year emphasised, without naming them, that the school had ten teachers and a strong science and mathematics curriculum. The following advertisement first appeared in the *Hampshire Advertiser* for September 08, 1855 and was repeated in five further issues (15/22 September, 20/27 October, 15 December) and with slight variations in the *Hampshire Telegraph* (3 November and 15 December) and the *Preston Guardian* (22 December).

QUEENWOOD COLLEGE, near STOCKBRIDGE, Hants.
Principal – Geo. Edmondson, assisted by Ten Resident Masters.
The course of studies in this Establishment includes, besides the usual English routine, Mathematics in all its branches, Natural Philosophy, Chemistry, both

theoretical and practical (laboratory), Classics, Foreign Languages, Geodesy, Mechanical Drawing, &c. Junior pupils receive a sound general education, whilst the studies of those more advanced are specially adapted to their future pursuits.

Prospectuses may be had, on application to the Principal.

N9.23. 1855: Summer celebration

The *Hampshire Advertiser* for June 16 reported Queenwood's annual summer end-of-term event.

QUEENWOOD COLLEGE- The midsummer vacation was, on Monday last, preceded by one of those happy entertainments for which, among secondary matters, this establishment is famous. The day was favourable, and the exceeding beauty of the place, with its fine trees and flowering shrubs, the numerous and admiring visitors and merry-hearted collegians, made up a scene of which the gaiety was contagious and the charms complete. Monday's proceedings seem to have surpassed all previous *fêtes* in extent and variety.

The program included:

A musical treat directed by Mr Cornwall ... generous refreshments ... a survey of drawings ...

an exhibition of gymnastic skill ... at eight o'clock, an interesting and well conducted debate on the present system of purchasing promotion in the army.

N9.24. 1855: Public lecture and appearance

During 1855, the *Hampshire Advertiser* for February 10 noted that "last Wednesday", Dr. Debus of Queenwood College gave a "very interesting lecture illustrated by experiment" to the members of the Polytechnic Institute. In its issue for August 25, the *Hampshire Advertiser* noted, among others, that George Edmondson had attended "Wednesday last" the annual meeting of the Hampshire and Wiltshire Educational Society.

N9.25. 1856: Staff continue community service

Dr. Debus continued each year to present public lectures, illustrated with experiments, to local societies. His subjects included "water", "salt" and "combustion". William Cornwall, the school's music master, also contributed to the school's identifying itself with the community. He became director of the Choral Society in the nearby village of Broughton and reports appeared of the Society's performances.

N9.26. 1856: Queenwood cricket takes to the field

The first report of a Queenwood College sporting activity appeared in the *Hampshire Advertiser* for June 14, 1856:

The Queenwood College cricket team was "defeated by Mr. Bruce's eleven by 119 runs at the New Sarum [Salisbury] Cricket Ground."

The same issue carried happier news for the nation. The Crimean War had ended and a thousand people celebrated at Alderbury. Queenwood cricket improved in the

following year suffering according to the *Hampshire Telegraph* only narrow defeats on Monday, June 1, 1857 against Hyde House School of Winchester.

During 1856, 1857 and up to August 1858 Edmondson continued his “10 masters” (N.22) advertisement in the same newspapers as in 1855. In the *Hampshire Advertiser* for January 09, 1859, it was noted that the content of Edmondson’s “Ten masters” advertisement appeared with “ten” changed to “nine”.

N9.27, 1858: The Oxford Middle Class Examinations

The Oxford Middle Class Examinations were introduced in 1858 for the benefit of boys leaving private and grammar schools who were unlikely to continue to universities. Newspapers in 1858-60 were searched for information, not altogether successfully as national and Queenwood examination results were not adequately reported. The findings and implications for Queenwood are discussed in Chapter 8.

N9.28. 1858: Queenwood College staff

In the *Hampshire Advertiser* for August 28 Edmondson again reported details of Queenwood staff. His list illustrates stability with respect to Heinrich Debus, Richard Wright, John Debus and William Cornwall but the five new names continue to indicate a high rate of change in other staff positions. Wright’s “Geodesy” of previous advertisements which listed staff has changed to “Practical Surveying, Levelling, &c”. Edmondson’s link with Hofwyl continues with a teacher of German arriving to share language teaching with Haas.

Edmondson’s original fees of 1847, 50 guineas per boy per year, varied little over a decade shown by the Office for National Statistics as a decade of fairly steady prices. A charge of £8 per year has been introduced for laundry and mending.

QUEENWOOD COLLEGE near STOCKBRIDGE, Hants	
Dunbridge Station, Salisbury Branch, South Western Railway.	
Principal: George Edmondson	
Natural Philosophy and Mathematics – Frederick R. Smith, L.L.D.	
Chemistry – Dr. Heinrich Debus, late assistant in the Laboratory of Professor Bunsen, and Chemical Lecturer in the University of Marburg.	
Classics and History – Daniel Hughes, M.A. Jesus College, Oxford	
Modern Languages and Foreign Literature – Mr. John Haas, from M. de Fellenberg’s Institution, Hofwyl, Switzerland	
German – Mr. Nicholas Wegmuller, from M. de Fellenberg’s Institution, Hofwyl, Switzerland.	
Practical Surveying, Levelling, &c – Mr. Richard P. Wright	
Drawing - Mr. Richard P. Wright	
English - Mr. Daniel Brightwell.	
English – Mr. William Trevor.	
Music – Mr. William Cornwall	
Terms	
Boys under 12 years of age:	£45 p.a.
12 and under 15:	55
Above 15	65

Laundress and sempstress fee 8 p.a. (Omitted if two or more from same family)

N9.29. 1858: Queenwood fete

The *Hampshire Advertiser* for August 28, 1858 reported a Fete at Queenwood College on Thurs August 25:

We seldom have had to record a more interesting event than the rural festival, or pic-nic, given by the worthy Principal of this excellent scholastic institution to his friends and to those interested in the important subject of education on Thursday last. Mr. Edmondson is eminently qualified for carrying out the great principles of education; his system being based on the soundest of theories, strengthens the expanding mind of the young, and prepares them for taking a prominent position in any sphere circumstances may place them in, in after life.

Nearly three hundred ladies and gentlemen, including several former pupils at Queenwood, attended on this occasion. The grateful repast was laid out in the Yew-tree avenue, under the shade of venerable relics of the Tudor age, which, arching over from either side, form a long vaulted aisle of great natural beauty. This avenue is an important feature on the Queenwood estate, formerly a part of the hunting seat of Tudorley, or Tytherley, of the eighth Harry. A sudden bend in the avenue brought the visitor rather unexpectedly to the festive scene, where, pendant from the rugged branches, the flags of all nations fraternized in the gentle breeze, emblematic of the universality of education. The toute ensemble was everything that could be desired, the weather was delightful, and joy and happiness on every countenance.

The students competed for prizes in the "Isthmian games" and visitors were able to inspect the school house – admirable arrangements – the classrooms and chemical laboratory – the spacious and airy sleeping apartments, every part of the arrangements show the practical mind of the Principal.

We must, however, not omit to mention the bath-room, fitted up in a most complete manner, with twelve separate private baths, in which the luxury of warm water is enjoyed by the pupils at all seasons of the year. It is almost needless to add that the excellent medical adviser has almost a sinecure office, sickness being very rare indeed among the pupils.

After tea on the beautiful lawn in front of the College the pupils gave a concert under direction of Mr. Cornwall. . .the lecture room was tastefully decorated. . . In the interval signed by thirty old boys an address was presented to Mr. Edmondson.

"We, the undersigned, former pupils of your establishment, are desirous of expressing to you the pleasure we feel at assembling, in accordance with your kind invitation, to revisit the place where we most happily passed so very important a period of our lifetime.

It had been peculiarly delightful to each of us to meet once more those from whom we have received so much kindness as from yourself, the members of your family, and staff of teachers beside those of our former comrades who have been able to partake of your hospitality, and whom we may have no future opportunity of seeing.

We therefore take the advantage of the occasion to thank you for thus enabling us to rekindle the friendships formed in our school life, and also of wishing you every success and the blessing of heaven may crown the life and future labour of yourself and family.”

During 1859, Edmondson continued with his “nine masters” advertisement, repeating it eight times in the *Hampshire Advertiser* between January and July.

N9.30.1860:Local competition

There was little news in 1860 about Queenwood College activities. The *Hampshire Advertiser* did not report Christmas or end of year concerts. In the absence of Queenwood College news and advertising, the opportunity was taken to examine the advertising of other schools in Hampshire, the Isle of Wight and nearby coastal towns. The *Hampshire Advertiser* for July 21, 1860, carried the following school advertisements (slightly edited). They indicated a cluster of schools which sought to prepare students for entrance to naval and military careers, not surprising considering the nearness of major ports and naval bases. In some cases the schools advertised for “sons of noblemen and gentlemen”. The number of schools in the Hampshire area which regularly advertised in the local papers indicated a considerable market for students whose parents could afford boarding school fees but Queenwood’s market appeal was limited: It did not provide a curriculum to prepare students for Oxford or Cambridge from which conscientious Quakers and other dissenters were excluded. As a Quaker-led school it would not have encouraged students to prepare for the military services – and Edmondson was a strong pacifist – nor sought class-distinguished students when Quakers discouraged pride in place. Edmondson’s market was thus limited. His original claim as a superior science-based academy was still strong: he had a high staff-student ratio and apparently well-qualified teachers. No other school advertised a Chemistry teacher. Elizabeth School, Guernsey offered civil and military engineering but its teacher was identified only by a teaching certificate – Member of the College of Preceptors.

IVY CHURCH ACADEMY, Classical, Mathematical, and Commercial, in union with the Royal College of Preceptors. Conducted by Mr. Sopp, L.C.P.

The Duties of this School will (D.V.) be resumed on TUESDAY, July 31st.

The Course of Instruction comprises the subjects appointed for the Examination of Pupils in union with the College of Preceptors. Highly respectable references can be given.

CUMBERLAND HOUSE CLASSICAL and MATHEMATICAL SCHOOL
Southampton

PRINCIPAL – Mr. LAVANCHY

Young gentlemen are prepared for the Military, Naval and Oxford Middle Class Examinations.

THE CHURCH, ARMY, AND NAVY, EGYPT HOUSE, NEAR WEST COWES
MR. WHITE begs to announce a few vacancies in his school for the SONS of noblemen and gentlemen. The course of instruction comprises a strict preparation for MILITARY and NAVAL CADET-SHIPS, and secures a good position for the pupils in the PUBLIC Schools.

Sea bathing and boating upon the spot. Duelling and the sword exercise are taught by a Serjeant of the Line.

HYDE HOUSE SCHOOL, WINCHESTER

PRINCIPALS: DR. BEHR and REV. EDWARD FIRMSTONE, M. A. (late scholar of Lincoln College, Oxford) assisted by Graduates of Oxford and Cambridge and Foreign Master (all of whom are residential).

This School is established for the education of the sons of noblemen and gentlemen, with a view to prepare them for the Universities, for the Public Schools, Naval, Military, and East India Colleges, the newly organised Competitive Examinations or any of the various professions.

ROYAL NAVAL ESTABLISHMENT

Eastern Parade, Southsea

Late Mr Thomas Eastman's (R.N.)

The following gentlemen have recently passed from this establishment as Naval Cadets: Messrs Hough, Dugdale, Coddington, Gissing, Lindeman, Bancroft, Campbell, Herbert, Kingscote, Wells, Baring, The Count F. Metaxas, Massy, Joyce and Watkins.

350 Gentlemen have passed from this Establishment as Naval Cadets, and more than 200 as Marine Cadets, &c.

ELVIN HOUSE SCHOOL, ANDOVER

"The College List in the Educational Times shows that, at the last Examination in May when 469 candidates from 44 schools competed, this School ranked first in Arithmetic, Natural Philosophy and Drawing; and, on former occasions, it has taken the lead in other subjects.

For an additional test, Mr Loxton (Principal) begs to refer to the Syndic's Analysis of the Oxford Middle Class Examinations in December, 1858, No. 100. The students' "uniformly good health" shows "unremitted attention given to the physical development of the pupils."

THE SOUTHHAMPTON COLLEGE AND BOARDING SCHOOL

Patrons: The Lord Bishops of Winchester, Bengal, Madras and Bombay

Principal: James Duncan, M.A., F.R.S.E.

The object of this Institution: Is to ensure to the Sons of Noblemen and Gentlemen a high Collegiate Education, with the care and comforts of a first-class Boarding School.

Course of study: Besides having especial reference to the Universities, includes preparation for the Naval and Military Colleges; for Commissions in the Army; for direct appointments to the East India Company's service; for the competitive Examinations for the Civil Service; and for professional pursuits in general.

ELIZABETH COLLEGE, GUERNSEY

Permanent Visitor: THE RIGHT REVEREND THE LORD BISHOP OF WINCHESTER

Principal -The Rev. A.T. CORFE, M. A., Oxford.

Vice-Principal - The Rev. J. OATES, M. A., Oxford.

Masters:

Classical and Mathematical: W. Lucas, B. A., Cambridge.

Lower School - Rev. W. Manning.

First Elementary French: M. (print illegible).

Second French: M. L. E. De St. Baer, B. A.

German - J. O. C. (Illegible), PhD (illegible) of the University of Brlangem (?)

Commercial, Civil and Military Engineering - T. Beesley, M.C.P.

Drawing: P. J. Naftel.

This College, founded and endowed by Queen Elizabeth, A.D.1663, was re-chartered by George the Fourth, A.D. 1826, when the present spacious building was erected.

The system of Education, commencing with an Elementary Course in the Lower School, comprises Religious Instruction, Classics, Mathematics, English, French and German Languages and Literature, Ancient and Modern History and Geography, Writing and Arithmetic, and affords complete preparations for the Universities and learned professions.

Pupils are admitted into the Lower School at eight years of age.

Peculiar facilities are offered to Students intended for any Department of the Civil or Military Service, and for Civil-Engineering. Special classes are formed to prepare candidates for direct appointments to Woolwich, Addiscombe and to Naval cadetships. Provision is also made for those who require instruction in Commercial Transactions and Book keeping, as well as in Land-surveying, Plan-drawing and Fortification.

The advertisement listed scholarships and prizes available at the school.

N9.31. 1861 Edmondson, inventor

The *Preston Guardian* for 25 September, 1861 carried this interesting item under the heading: "The following patents were sealed last week".

George Edmondson, of Queenwood in the county of Southampton (formerly of Tulketh Hall, near Preston) for improvements in washing machines.

N9.32.1861 Edmondson in Court

No school news was noted for 1861 but by December Edmondson was not thinking of washing machines. The Times, London, December 13, 1861 reported that on the previous day George Edmondson, Principal of Queenwood College, Hampshire was before the Court of Queen's Bench, Guildhall, as defendant in a wrongful dismissal case. Putting the story together from the Court Report, the Queenwood advertisement detailing staff (N.28.1858) and Hirst's resignation from Queenwood in May, 1856 to attend to his sick wife (Brock, p. 19), it seemed Hirst had introduced Frederick R. Smith, then headmaster of the Wesleyan School, Dublin to Edmondson as a possible successor. Edmondson appointed Smith in August, 1856 to take charge of Natural Philosophy and Mathematics at a salary of £180 per annum. According to the Court report, "no difference appears to have existed between the plaintiff and defendant down to August, 1861." The new school year was due to open on August 1 but, as usual, it was customary for an ad hoc time table to operate in the first fortnight until all the boys and staff had arrived. Each day, John Haas posted the provisional time table. On August 10, Smith was directed to classes. He protested to his first class that Debus had received no posting in the previous nine days, and he would not teach until Debus was assigned a class. Smith dismissed his class to the playground. Edmondson ordered Smith to recall his class. Smith refused and Edmondson wrote him a letter dismissing him. It was cited as: "Such a case as a master refusing to attend to my wishes has never occurred to me in my life before. Thou art no doubt aware that by refusing to take a class yesterday thou hast broken

the contract between us and rendered it null and void.” Smith immediately instituted action for a quarter’s pay in place of three months’ notice. The jury found for Smith and ordered Edmondson to pay £60 in damages.

No school news was identified in 1862 and on May 16, 1863 Edmondson suddenly died.

N9.33.1863. Obituary

On May 23, the *Hampshire Advertiser* carried this obituary.

We have with very much regret to announce the death of Mr. George Edmondson, who was known and highly respected by a very wide circle of friends, as the Principal of Queenwood College. Mr. Edmondson had been slightly indisposed on Wednesday week. On the previous day he went to Salisbury on business; on the Thursday morning he appeared not quite so well, and soon after he experienced a severe attack of apoplexy, which he survived but a few hours, and expired about 6 o’clock on Friday morning. His death will be heard with surprise and regret.

Many of our readers will remember Queenwood College under its former name of Harmony Hall, it having been built for the accommodation of a body of Socialists, a leader of that community, the late Robert Owen, then residing near. The principles of Owen did not take kindly root in Hampshire – the attempt to localise them failed – and the change which Mr Edmondson wrought in the use of the imposing and costly structure which had been erected at Queenwood was a matter of general congratulation at the time. Some of those who read these lines will also remember Queenwood after it had passed under the transforming hand of its late proprietor- when to the original edifice had been added, year by year, some new feature - such as a workshop for pupils mechanically inclined, a laboratory for students of a scientific turn, a playroom for the enjoyment of all, besides gas-works, water works, and cottages. Under its new ownership the region which had been a desert began to blossom with the rose: and few who ever shared them will forget the spectacle of those summer fetes, when the “school” was revelling in mirth and the eye was charmed with the cultivated beauty and the natural happiness of the scene. It needed an enterprising spirit to undertake this transformation and an indefatigable hand to accomplish it; but the work has been successfully done.

Mr. Edmondson, as we are informed by those who knew him well, had entered early in life into his vocation, and had therefore spent nearly half a century in the cause of education. From his 15th to his 66th year – to the day, that is of his death –he was perseveringly occupied in this labour, with the exception of a seven years’ interval during which he was engaged by Emperor Alexander I. in reclaiming certain waste lands near St. Petersburg. On his return from Russia he began life as a schoolmaster in the town of Blackburn, with a single day-scholar. His day-school very soon became a flourishing boarding establishment, too small to hold all applicants for admission. Mr. Edmondson then removed to Tulketh Hall in the neighbourhood of Preston.

In the year 1847 he left his flourishing school at Tulketh, to occupy Queenwood, which attracted him by the prospect of an increased sphere of activity and usefulness. Taking care to surround himself at all times with an ample staff of able coadjutors, Mr. Edmondson soon established a wide and well-deserved reputation for Queenwood as an educational college, and the number of pupils under instruction there has of late years averaged from 100 to 110. In these 16 years which he spent at Queenwood as many as 800 pupils have had the advantage of his training; by these, whether they are now men battling with the cares of life, or striplings about to take their part in that engagement - by all the gentle and considerate master of a former day will long be affectionately remembered. Benevolent, sagacious, industrious, earnest - a true Christian and warm-hearted lover of his kind - such is the testimony of those who knew best the character of the departed; in his case death may surely be regarded as the transit of a good man's spirit to "haven where it would be".

N9.34.1863. A second obituary

This delineated reasons why Edmondson's school had not flourished (a man of Quaker speech, North Country accent and manners unfamiliar in the Hampshire area).

N9.35.1863. The auctioneers' notice

Co-incident with Edmondson's death the representatives of the Owenite Community from whom Edmondson had bought the Queenwood leases, in 1847 finally settled its own mixed-up finances and was able to auction what it could of the Queenwood College assets. The Auctioneers' sale notice provided details of the school which the Edmondsons had developed. In the *Hampshire Advertiser* for October 10, 1863:

In Chancery Pare v. Clegg - Absolute Sale Hants - Queenwood College and Grounds, a costly and commodious Edifice, adapted for Educational purposes, to which is at present devoted, for a Private Asylum or Public Institution, with the compact farm of about 500 Acres with the complete Homestead, Cottages, two semi-detached Residences, Gas Works, & etc.

Messrs. Edwin Fox and Bousefield (the Persons appointed for the purpose) are directed to SELL by AUCTION, at the Mart, London, on WEDNESDAY next, October 14, at 12 o'clock, in the one lot, a VALUABLE LONG LEASHOLD ESTATE, known as QUEENSWOOD, situated in a healthy and fine Sporting part of the county of Hants, in the parish of East Tytherley, four miles from Dunbridge Station on the South Western Railway, nine miles from the market towns of Romsey and Salisbury, which are distant about twelve miles respectively, and seventeen miles from Southampton.

The Estate comprises a noble building, distinguished as QUEENWOOD COLLEGE, erected by the late Robert Owen, in the most substantial manner at an expense of upwards of £20,000, and admirably adapted for the accommodation of a large number of persons. It is at present in the occupation of the representatives of the late George Edmondson, Esq., (on a lease, expiring

in 1868) whose success as an educationalist has conferred a just celebrity on the place.

The Mansion contains eight large dormitories, each 33 ft. by 21 ft., lavatories, twenty other bed chambers, noble reception rooms, private parlours, spacious dining halls, banquetting saloon or lecture room, about 40ft. by 24ft.; a distinct wing, three stories in height, contains about fourteen class and school rooms, and the domestic arrangements are very complete.

The pleasure grounds (through which the house is approached by a carriage drive with lodge entrance) are beautifully laid out: there is also a large kitchen Garden, orchards, playing fields, &c. The out-buildings include laundry with steam-power; hospice, laboratory, and gas works, in complete working order, with supply throughout the premises; stabling, hothouse, &c. The land comprises about 500 acres chiefly arable; 328 acres called QUEENWOOD FARM, being within the parish of East Tytherley, and the remainder, called EAST AND WEST BUCKHOLT, being extra parochial.

Upon the farm is a complete homestead, with the bailiff's Cottage. Also, two modern Semi-detached HOUSES, lately built by Mr. Edmondson, whose judicious outlay on the estate subsequent to the large expenditure by the original lessee has added greatly to its value.

The property is held for a term of seventy-five years unexpired, at a low rental, and is underleased for a term, expiring as hereinbefore-mentioned, at a rental of £600 a year. May be viewed by permission, and particulars obtained from etc.

N9.36. 1863 Sale result

The *Hampshire Advertiser*, October 17, 1863, under head:

“Stockbridge_Queenwood College” reported that:

The executors of the late Mr. George Edmondson have purchased the lease of Queenwood College and farms, and intend to continue the school as a first-class educational establishment for boys. The school was opened in 1847 by Mr. Edmondson, who succeeded in a few years afterwards in getting together as many as 116 pupils. The arrangements are made for accommodating 120.

Clever executors! Presumably, Mrs Edmondson was now in charge of Queenwood College and no longer inhibited, if her husband ever were, by partners who owned eighty per cent of Queenwood College. We don't know if the other four shareholders were ever compensated. Royle (1998, p. 212) reports that “the hall was sold at auction for £2,800”. However, the above auctioneers' advertisement and the subsequent news report make it clear that “in one lot” the sale was of the property leases. William Pare, who was one of Edmondson's partners and a former Governor of the Queenwood Owenite farm co-operative, was instrumental in bringing about the sale through Chancery. He appealed against the price paid and the Court of Chancery caused the purchasers, Edmondson's executors, to pay the higher price of £3,900.

N9.37. Death of Mrs Edmondson

Mrs Edmondson lived just one month to enjoy her presumed proprietorship of Queenwood College. The *Preston Guardian* for November 21, 1863 reported her death:

On the 19 inst, at Weymouth, Ann, relict of the late Mr. George Edmondson, of Queenwood College, Hants, and formerly of Tulketh Hall.

And the *Hampshire Advertiser* for the same date:

On the 19th inst., at Weymouth, aged 65 years, Anne, widow of the late George Edmondson, of Queenwood College, Hants.

N9.38. 1863: Future of Queenwood

The *Hampshire Advertiser* for November, 21, also reported:

In our obituary of this day we have to notice the decease of Mrs. Edmondson, widow of the late Mr. George Edmondson, of Queenwood College, who died a few months [days!] since. We hear on good authority that the executors of the late Mr. Edmondson have purchased the long lease of the whole of this extensive and well ordered establishment, and that an arrangement has just been concluded with a gentleman, a member of the Society of Friends, at present conducting a large school in the North of England, by which the College will be transferred to him at Christmas, and continued on the plans so successfully adopted by the late esteemed principal.

Willmore's Advertising, News and Promotion 1864-1896

VI.3 Willmore's Advertising, News and Promotion 1864-1896

Charles Howson Willmore took over the school and became Headmaster on January 1, 1864. According to Parks and Gardens UK Willmore presided over Queenwood College until he closed the school and retired in 1896. Willmore's final advertising of the school was noted in 1894 and final news about the school appeared during 1895.

N10.39. 1864: Absence of Queenwood advertising in Willmore's first year

Puzzling is the fact that searches in 1864 newspapers, Willmore's first year, failed to identify any statement by Willmore or interview with him about his experience, qualifications and plans for Queenwood.

N10.40.1864: Ghosts of teachers past

The search of the 1864 newspapers produced eight advertisements with references to Queenwood College but all on behalf of other schools! In the *Preston Guardian* for January 9, 1864, T. S. Fraser announced he was opening a new school, the Chester Middle School, and that he was formerly a master at Wilmslow School, presumably

Willmore's, because the advertisement included "Reference permitted to the Principal of Queenwood College, Hampshire". Fraser repeated his advertisement in the *Preston Guardian* in the following week. It read: "Terms: 45 guineas inclusive for board and education, inclusive of French and German, no extra charges. Opening on Thurs. Jan 25, 1864. Prospectus will be sent post-free."

In the *Hampshire Telegraph* for January 23, June 18, July 9 and July 23, Richard P. Wright, whose "experience as a teacher was acquired during the past fifteen years under the late George Edmondson, Esq., of Queenwood College" advertised his "School for the General Education of Boys" at 6, South Parade, Southsea."

In *The Times* for July 13 and December 31, Dr. Mummery advertised his school, Iver Grammar School, near Uxbridge as providing "a religious, physical and practical education, with much attent on to comfort and health that for several years a sickness has been almost unknown. Principal, Dr. Mummery, First-Greek Prizeman and formerly Head Classical Master at Queenwood College. French and German spoken. Preparation for examinations. Terms 25-30 gs." [Mummery was dismissed from Queenwood at the end of 1853 for titling himself "Doctor" on the strength of a £25 certificate from a German university (see Appendix N9.18).]

N10.41.1865: Queenwood advertising

Willmore may have been a modest Quaker disinclined to "puff" himself or his school but his 1865 advertising suggested himself innocent of the function of advertising. Between July 22 and December 16, he placed the one advertisement nineteen times in the local *Hampshire Advertiser*:

QUEENWOOD COLLEGE near Stockbridge,
For particulars and terms apply to
Charles Willmore, Principal.

The advertisement suggested no reasons why any parent might apply for "particulars" and was restricted to the Hampshire area where, as indicated in N30 there was considerable competition from a number of schools. Willmore had only to look at the whereabouts of his students' homes to see regions to which his advertising could be directed

N10.42. 1866-1868: Queenwood advertising.

Willmore's advertising for the next seven years was mainly restricted to the *Hampshire Advertiser* and of the reminder type; just the school name and term dates. Willmore widened the scope of his advertising with an announcement in the *London Pall Mall Gazette* of July 30, 1868 to the effect that "Queenwood College, Hampshire, reopens Tuesday, August 4."

In the *Hampshire Advertiser* for August 8 and *Pall Mall Gazette*, October 12 and 15 a Longmans, Green advertisement appeared for Richard Wright's book, viz.,

ELEMENTS OF PLANE GEOETRY, for the use of Schools and College. By
Richard P. Wright, formerly teacher of Geometrical Drawing, &c in
Queenwood College, Hampshire. With a Preface by T. Archer Hirst, F.R.S, &c.,
Professor of Mathematics in University College London. London: Longmans,
Green, and Co., Paternoster Road.

In *The Literary Examiner* (London) for January 9, 1869 appeared the following review of Wright's book.

'Euclid's Elements' have proved too good a makeshift. That a work two thousand years old, not intended as a text book of geometry, should still be used as such, almost to the exclusion of its rivals, while every other science has its own little library of manuals brought down to the knowledge and methods of the day, is a great tribute to its merits, but not very satisfactory to friends of education. In spite of all its excellences, partly in consequence of them, 'Euclid's Elements' are not the best school-book. They teach some simple matters in a cumbrous way, attempt to prove some doctrines that cannot be proved, and omit some problems and theorems that are quite susceptible of demonstration. These are complaints often uttered of late years, and many unsatisfactory attempts have been made to provide a really good substitute. This volume of Mr. Wright's, if not altogether satisfactory, is so good that it seems as if a little more care would make it all that can be desired. As it is, it is a capital school-book, and worth the notice of all teachers who, in holiday time, are on the look out for a new hand-book of instruction for their pupils. It is based on the lecture-notes of Professor Hirst, one of the ablest, if not quite the ablest of our living mathematicians. He not having the time to work up his notes into a complete volume, the task has been undertaken, with his sanction and guidance, by Mr. Wright, who has also made good use of other men's views and plans, both at home and abroad. It will be enough for us here briefly to recapitulate the method of the book. Assuming that the pupil is already in possession of "many simple and incontestable true notions" which Euclid demonstrated with great ingenuity, it starts with an exposition of the properties of straight lines and their combinations in angles, triangles and parallelograms. These occupy the first book; the second treats of the properties of the circle; and these two supply a concise substitute for nearly all the Euclid that is taught in elementary schools. The third is intended to take the place of the discarded fifth book of Euclid, teaching proportion by the help of arithmetic and algebra. The fourth and last book treats of "the equivalence of figures, and the valuation of areas."

N10.43. 1869: John Bottomley on staff

In the *Hampshire Advertiser* for March 06, 1869, under the by-line of "Romsey Mutual Improvement Association:"

On Tuesday evening, Professor Bottomley, of Queenwood College, delivered a lecture for the above society, at the Townhall, on "Poisons and their detection." The subject was well treated.

John Bottomley, D.Sc. seems to have succeeded Dr. Heinrich Débus as the chemistry master at Queenwood College. Débus who had been recruited by Tyndall had arrived at Queenwood early in 1852 and continued after Edmondson's death with Willmore for four and half years before, as shown in the Clifton College Staff Register, he moved to Clifton College, Bristol for the beginning of the 1868-69 school year. Bottomley continued at Queenwood until at least March 1871 as the March Population Census showed him resident at the College.

N10.44.1869: International competition

If Willmore in 1868 felt that the publication and review of Richard Wright's book gathered negative publicity for Queenwood College, Wright was, so to speak, out-spaced in 1869 by John Haas who three times in the *Hampshire Advertiser*, June 16, 23 and July 03 advertised his Swiss school.

<p>EDUCATION ON THE CONTINENT.</p>

<p>Mr. JOHN HAAS (for many years of Queenwood College, near Stockbridge), Head Master of the College of Morat, near Neuchatel, Switzerland, receives into his House, a LIMITED NUMBER OF PUPILS, from 12 to 16 years of age. First class references. Terms and full particulars on application</p>
--

N10.45.1869: Cricket victory

The *Hampshire Advertiser* for September 29, 1869, reported that Queenwood's cricket team playing at home, narrowly defeated the Sherfield Park Cricket team.

N10.46.1869: Willmore performs

In its issue for December 04, 1869, the *Advertiser* reported that on the previous evening at Broughton the "fourth series of penny readings for the season was held under the presidency of Dr. Fox." There were songs and readings. The Principal of Queenwood College recited from Thackeray and Tennyson, giving with much feeling, 'Grandmother's Apology.'

N10.47.1869: Scholarship for Queenwood

Press mentions of Queenwood College concluded for the year with a report in *The Standard* (London), December 08, that Queenwood College had gained a £25 scholarship, one of ten awarded by the Sir Joseph Whitworth's Exhibitions.

N10.48. 1870-1873: Queenwood advertising.

1870 opened with John Haas early claiming the major share of references to Queenwood College and seeking students from Queenwood's home area. In the *Hampshire Advertiser* for January 15, 22 and February 05 Haas repeated his advertisement with the amendment that there would be "Vacancies after Easter".

N10.49. 1870: A top result for a Queenwood boy

The *Morning Post* for February 01 reported that William Henry Blake of Queenwood College had gained honours in the first division of the London University Matriculation examinations.

N10.50.1870: Mr Willmore's groom in knife attack

"Mr Willmore of Queenwood College" was mentioned in the *Hampshire Advertiser* for June 04, 1870.

<p>Henry Collins, groom to Mr Willmore of Queenwood College was attacked outside the Greyhound Inn, about 10 o'clock, on Sunday evening. He was attacked with a knife. Prisoner, Charles Offer, was found guilty.</p>

[That was the same pub referred to by Tyndall and sympathetic Frankland, as the “Dog”, where on May 23, 1848, they had drowned their sorrows after Tyndall had disagreed, and apparently been outvoted on the “Queenwood Reporter” committee by Mrs Edmondson and Jane Edmondson. Tyndall and Frankland had returned to the College that night in “a serious condition.”]

N10.51.1870: Cricket woes

“On Thursday last”, the *Hampshire Advertiser* for August 27, reported that the Queenwood eleven had been defeated by the Portswood Park Cricket Club.

N10.52.1871: Queenwood advertising for April

In the *Hampshire Advertiser* for April 05, 08 and 12, 1871, Willmore announced:

QUEENWOOD COLLEGE near STOCKBRIDGE, Hants.
THE NEXT QUARTER COMMENCES THURSDAY, APRIL 13.

[During that month there was fighting in Paris between Royalist troops and Paris communes attempting to take over the city.]

N10.53.1871: Athletics meet

On Saturday May 13, 1871 Willmore demonstrated his affinity with his boys in a ceremony to which it would be hard to imagine Edmondson lending his support as he disliked displays of emotion relating to differences in ability. Willmore took his boys to Abbot’s Park, near Southampton to take part in the Portswood Park Cricket Club’s annual spring athletic meeting. The *Hampshire Advertiser* for May 17 reported that the Queenwood boys were eligible to take part in twelve of the events. They won prizes in six of them: 200 and 300-yard races, a high jump, Siamese and sack races. Mr Willmore provided a silver cup for the Hammer Throw.

N10.54.1871: Queenwood celebrates Dr. Hopkinson’s achievements

On the next Saturday, Queenwood was again in the news. The *Hampshire Advertiser* for May 20 reported a celebration at the College to honour the academic distinctions of an old boy, Dr. Hopkinson. The report included:

QUEENWOOD COLLEGE- Now that education is so much talked about, it is a pleasure to bear record to the success of any of the schools in our neighbourhood, particularly when a senior wranglership is obtained, as it has been by Dr. Hopkinson, who was educated for nearly six years by Mr. C. Willmore, of Queenwood College. From Queenwood Dr. Hopkinson went to Owen’s College, Manchester, there he took the Dalton Mathematical Scholarship, subsequently took a Whitworth scholarship, an open scholarship at Cambridge, and the Sheepshanks scholarship. He further took a scholarship at London, of which university he is a doctor of science in two branches. All this, and his wranglership, and Smith’s prize, by the time he is barely 21 years of age (!).

In a large marquee which had been erected on the lawn, there were toasts and speeches, including an Address from the College boys to Dr. Hopkinson,

presented by the senior boy, T.G. Munyard. Dr. Hopkinson, in his reply said it gave him great pleasure to receive this address. He quite attributed his success in his studies and examinations to the six years he was under Mr. Willmore's care, and he begged to express the same publicly and to thank his old master for the kindness and attention he had always displayed to him.

At 5 o'clock the visitors and boys had tea together in the marquee, followed by sports. Dr Hopkinson was champion in the hurdle race, winning by a neck.

The 1st Wiltshire Rifle Band enlivened the whole proceedings.

Hopkinson had come to Queenwood with Willmore. His final years there would have been under Débus, the Chemistry master.

The *Newcastle Courant* for Friday May 26, 1871 under the head: THE SENOR WRANGLER AND HIS SCHOOL DAYS carried a brief account of the Queenwood College celebration for Dr. Hopkinson mentioning that the boys' address to Dr. Hopkinson was "engrossed on vellum" and that the boys assured him "that the honour done to Queenwood would ever stimulate to earnest effort on the part of the boys." The next day, May 27, *The Manchester Times* carried the same story under the same heading as the *Newcastle Courant*.

[In the same issue, the *Newcastle Courant* carried a dispatch dated May 8 which reported that Paris was in flames from the civil war and that fire engines from "all the districts around Paris" had been unable to get through the "circle of iron" to assist putting out the flames.]

N10.55. 1871: Queenwood advertising June-October

In the *Pall Mall Gazette* for June 19 and 24, 1871, Willmore presented a more positive, if still inadequate message about the school's function.

QUEENWOOD COLLEGE near STOCKBRIDGE, Hants
PREPARATION for the LONDON MATRICULATION EXAMINATION

The second half-year commences Tuesday, August 8

Between June 14 and October 14, 1871, the advertisement was noted 21 times in the *Hampshire Advertiser* that was in almost every issue of the bi-weekly. Only the dates of the next quarter or half-term varied.

[In the *Hampshire Advertiser* for June 21, the railways displayed excursion prices to the Crystal Palace in London to hear a Coronation performance of 4,000 voices.]

[*The Newcastle Courant*, May 26, 1871 reported an imminent strike by Tyne engineers in support of the nine-hour movement. *The Manchester Times*, May 27, reported workers in the heavy woollen trades were asking for the Saturday half-holiday to start at midday, rather than 2.0 p.m.]

N10.56.1872: Queenwood advertising

In 1872, Willmore continued to insert the same advertisement as previous in almost every issue of the *Hampshire Advertiser* up to June 15 when he varied the second line to read: "Preparation for the London Matriculation Examinations and for the Royal College of Surgeons". He inserted the amended advertisement three times in the *Pall Mall Gazette*, once in *The Graphic* (London) and continued it in almost every issue of the *Hampshire Advertiser* up to mid-October.

[The movement for improved working conditions came close to the school when near Romsey in May the *Hampshire Advertiser* for May 18 reported that:

The agricultural labourers of Braishield have started a "Union" for the promotion of all objects tending to improve their condition. They elected a committee and gave three cheers for the success of the Union. Also to two farmers who had, unsolicited, advanced their men's wages. The motion carried was that: Wages should be 13s a week; hours 6 to 5 o'clock (one hour less on Saturday); 4s 6d per day during hay harvest (with refreshment) and 3d an hour overtime; Harvest carting time to be from 5 to 7 o'clock; wages 4s (with refreshments), and 6d an hour overtime.]

In the *Hampshire Advertiser* for December 14, 1872 the school announced it would change to three terms a year.

QUEENWOOD COLLEGE near STOCKBRIDGE, Hants.
In accordance with the wishes of the great number of the Parents of the Pupils the SCHOOL YEAR will for the future be divided into THREE TERMS instead of two half-years.

N10.57. 1873: Queenwood advertising

Willmore continued to use the N10.56 advertisement with appropriate changes for dates of terms from January to September, 1873 with frequent insertions in the *Hampshire Advertiser*, two in the *Pall Mall Gazette* and one in *The Graphic*.

N10.58.1873: Cricket results

As in previous years the *Hampshire Advertiser* reported Queenwood cricket results: on May 7 the team was defeated at Hurstbourne Park and in July at home, convincingly defeated Winterslow.

N10.59.1873: Old Boy qualifies as surgeon

The *Hampshire Advertiser* for July 26, 1873 noted that Gilbert Herbert Coates, surgeon, of Salisbury, former Queenwood College student, had passed the membership examination of the Royal College of Surgeons, London.

N10.60. 1873: Detailed Queenwood advertisement

In the December 18, 1873 issue of the *Hampshire Advertiser* appeared the longest school advertisement noted since Willmore took over the school on January 1, 1864.

THE FIRST TERM of 1873 will COMMENCE Jan.15th, and end April 9th.
PREPARATION for the LONDON MATRICULATION EXAMINATIONS and for the ROYAL COLLEGE of SURGEONS.
QUEENWOOD COLLEGE has long been celebrated for the SCIENTIFIC TRAINING it affords. Nothing is spared to maintain its character in this respect; at the same time the younger boys receive a thorough grounding in the studies which must form the basis of education.
For particulars apply to C. WILLMORE, Principal.

N10.61. 1874-1878: Queenwood supported by eminent referees.

Queenwood College opened 1874 with remarkable advertisements in the *Pall Mall Gazette* for January 14 and February 28. In the first, Willmore announced that the College provided “a sound education for boys,” gave “special attention to Science, particularly to Chemistry, both theoretical and practical” and that references were available from six named Fellows of the Royal Society. In the second advertisement the named referees had increased to seven. Willmore repeated the substance of the February advertisement with its names of seven Fellows of the Royal Society throughout 1874 -1877 and in 1878 up to an advertisement in the *Pall Mall Gazette* for July 20, 1878. The seven referees were named as Dr. Debus, FRS., Dr. Frankland, FRS., Dr. Roscoe, FRS., Dr. Angus Smith, FRS., Dr. Tyndall, FRS., Dr. Voelcker, FRS., Dr. Williamson, FRS. Their details are as follows:

1. Dr. Heinrich Debus, FRS

Debus, had a long association with Queenwood College where he started teaching chemistry in 1851, having been recruited by Frankland from Marburg University. He continued at the College for 17 years, first with Edmondson, and then Willmore. He moved to Clifton College in 1868, then, according to Brock, in 1870 to the position of lecturer in Chemistry at Guy’s Hospital London. During the duration of the advertisement and until his retirement in 1888 he was Professor of Chemistry at the Royal Naval College, Greenwich. (Brock, 2004a)

2. Dr. Edward Frankland, FRS

In 1847-48 Frankland at age 22 was Queenwood’s first chemistry teacher He left to pursue a PhD at Marburg University and then completed a brilliant career in commerce as a consulting chemist and in academia. He was knighted in 1897. During the period of the advertisement he was Professor at the Royal Chemical Society. He was giving lectures to teachers on practical laboratory instruction and published *How to Teach Chemistry* in 1875. Between 1868 and 1876 he published a number of papers dealing with analysis of drinking water. In 1877 he founded and became president of the Institute of Chemistry described by Russell as “the world’s first professional organization of chemists”. (Russell, 2006)

3. Dr. Henry E. Roscoe, FRS

During the period of the advertisement, according to Kargon (2004), Roscoe was consultant and a member of the Royal Commission on Noxious Vapours and “his substantial Treatise on Chemistry, written with Carl Schorlemmer, appeared in 1877-84.” In 1857, he followed Frankland as Professor of Chemistry at Owens College, Manchester, “where over twenty-five years he established as an important aid to industry through its teaching of chemistry and training in research.” He was knighted in 1884, in particular for his service on the Technical Instruction Commission. (Kargon, 2004)

4. Dr. Robert Angus Smith, FRS

During the four years in which Willmore displayed his advertisement, Smith, a consulting chemist in Manchester held two Government positions: as an industry inspector under the Alkali Act which prohibited factory discharge of gaseous hydrochloric acid and as an inspector for the 1876 Rivers Pollution Prevention Act which prohibited the discharge of untreated waste into rivers and streams. He was also a vice-president of the Chemical Society and of the Manchester Philosophical

and Literary Society. Smith researched particles and pathogens in urban industrial air and their relation to health. (Hamlin, 2008)

5. *Dr. John Tyndall FRS*

In 1847-8, Tyndall had been the first teacher of surveying and physics at Queenwood College and for a period in 1851-3 after he had obtained his PhD. According to Brock (2004b) during much of the 1850s and 1860s Tyndall was professor of Natural Philosophy at the Royal Institution and, also during the 1860s at the Royal School of Mines. In 1867, on the death of Faraday, he became Superintendent of the Royal Institution. At the time of Willmore's advertisement, Tyndall was close to finishing his studies of sterilization which killed the idea of spontaneous generation of organic matter. Throughout his professional life, Tyndall supported Queenwood College.

6. *Dr. Augustus Voelcker, FRS*

During the period of Willmore's advertisement Voelcker, according to Nicholas (2004), was chairman of the London Farmers' Club and a founder and a vice-president of the Institute of Chemistry of Great Britain and Ireland. As consulting chemist to the Royal Agricultural Society of England he conducted "13,068 analyses of agricultural products to provide consumer information to members about farmyard manures and fertilizers, soil processes, the feeding of animals, milk and dairy practice" which, "contributed significant increments of knowledge to agricultural science." (Goddard, 2004)

7. *Dr. Alexander W. Williamson, FRS*

Williamson was appointed professor of analytical and practical chemistry at University College, London in 1849. He held that position for thirty-eight years so that he was teaching at the University College during the period of Willmore's advertisement. Williamson had strong opinions on teaching technique – he regarded it as vital to lead from individual facts to general principles, rather than the reverse. In 1865 he published a successful elementary textbook, *Chemistry for Students*. Williamson's early research established a theory and a method of synthesizing organic products – of immense importance to the chemical industry and which assisted the theory of chemical structures. (Rocke, 2004)

N10.62.1879: Mutual Improvement Society in news

No school advertising was noted in 1879. A news item appeared in the *Hampshire Advertiser* for October 04, 1879 and which subsequently was reproduced in other newspapers, indicated that the original Mutual Improvement Society set up for the boys' experience of self-government and to produce their own newspaper was still active. Under the heading of Queenwood College, Oct 4:

"The report released on Sept 2 of the committee of the Queenwood Mutual Improvement Society, for the end of the Summer Term, 1879, gives the following interesting account of three tame crows." It reported that raised by the boys from their nest, the crows adopted all the boys of the school, staying in the school grounds, alighting on their arms, following them on their country walks, picking pockets and stealing from bedrooms. The report said: "They would come to welcome their friends first thing in the morning as they came up the asphalt from the house to the schools."

N10.63. 1880-1885: Queenwood advertising.

Willmore opened his 1880 advertising in the *Pall Mall Gazette* for January 20 with a short but smarter advertisement than he had previously used. No longer relying on the endorsement of the seven Fellows of the Royal Society, he stated benefits which the school supplied:

QUEENWOOD COLLEGE near STOCKBRIDGE, Hants
 A high-class private School for Boys. Scientific, technical, and classical training.
 Preparation for University and Competitive Examinations.
 The Spring term commences January 20.
 C. WILLMORE, Principal.

He repeated this advertisement in the *Pall Mall Gazette* for April 3, 14 and 21. No further advertising was noted for 1880. In 1881 Willmore placed notices only of term dates in the *Hampshire Advertiser*. In 1882 Willmore sparsely used the above advertisement in the *Pall Mall Gazette* and the *Hampshire Advertiser*, omitting the second line; likewise in 1883. No advertising was noted for 1884 and in 1885-94 he mostly used merely the name of the school and the date of the following term in the *Pall Mall Gazette* and *Hampshire Advertiser*. A few advertisements were longer. For example, in 1892, in the *Hampshire Advertiser* for April 30, May 4 and 7 appeared this advertisement:

QUEENWOOD COLLEGE, near STOCKBRIDGE, Hants
 A high-class private school for boys, long known for its Science teaching.
 Queenwood is absolutely in the country, and so healthful it might be a health resort.
 The summer term begins the 4th of May

In 1885, according to Royle (1998, p.217n) “The school was advertised [in *Kelly’s Hampshire*] as having seventy boarders, fees of £100 a year and no sectarian teaching.”

N10.64. 1880: Queenwood College news.

Though Willmore’s classified advertising was sparse, largely of the reminder type and narrowly directed – the *Pall Mall Gazette* and the *Hampshire Advertiser* appeared to be the main newspapers used by Willmore – the school was constantly in the news sections during these final years through the activities of the Old Boys’ Associations, functions at the school and results of its cricket, football and athletics activities.

The *Hampshire Advertiser* for December 11, 1880 reported:

QUEENWOOD COLLEGE- It is announced that the annual Queenwood dinner will be held at the Criterion restaurant, London, on Wednesday, the 15th inst. The Rt. Hon. H. Fawcett, [Professor Fawcett, Post Master General] himself one of the most eminent of old Queenwood boys, will be in the chair. The list of those who are expected to be present includes many names well-known in literature, science, and art, and a most interesting meeting is confidently anticipated.

This would have been an historic meeting. Henry Fawcett was Edmondson's first student when Queenwood College opened in August, 1847. Despite losing his sight when shot by his father during a partridge hunt, he became Professor of Political Economy at Cambridge and was Post-Master General when W. E. Gladstone was Prime Minister.

N10.65.1880: Queenwood College illustrated

The Graphic for December 31, 1880 issued its annual index of illustrations. Illustrations of Harmony Hall, Queenwood College, were to be found on page 667.

N10.66.1881: The legend grows

1881 started with an article of more than 700 words in the *Hampshire Advertiser* for January 1. The writer re-worked material that had first appeared in 1848-49 (N4) and extended its legendary aspects back to Elizabethan times, varying the theme of "Queen Elizabeth slept here" to "Queen Elizabeth read here."

HARMONY HALL, QUEENWOOD HANTS

In a hollow of the Hampshire Downs, a furlong or so from the line of the Roman Road, between Old Sarum and Winchester, nestled amid its trees, stands a modern building of considerable size and quaint architecture. Looked upon apart from its surroundings, it might almost be called ugly; but the toute ensemble of the picture it forms, in conjunction with the varied foliage in which it is embedded, is one of striking and unusual beauty; house and trees, both in form and hue, seem in complete harmony. Quite guiltlessly of any punning motive did we write the last word; but "Harmony Hall" was the very name of this building when it was founded some forty years ago by Robert Own, the Socialist. Here he hoped to establish a successful community, whose members should live together on terms of happy equality, and share evenly in the labours which were to procure them daily sustenance. The building was erected in the centre of several hundreds of acres of farm land, of which a long lease had been secured. This property had been known for generations as the Queenwood farm, its name being traditionally derived from the circumstances that a wood upon it had been a favourite resort of Queen Elizabeth; and a leafless yew is still pointed out as the tree beneath which she used to sit and read. The farm, then, was to be the main source of subsistence for the young community. There is something romantic and taking in the idea of these people thus living in Arcadian simplicity and bliss on their own land, in the midst of a charming and sparsely populated district, far removed from the squalor and vice of towns. It would have been the Golden Age come back again had the scheme been even but half successful; and many of them believed in the complete success of it; they had the full conviction that they had discovered the panacea for the ills that business competition entails on humanity. Further, they had no selfish idea of keeping their discovery to themselves: they strove hard to spread the knowledge of it, and Sunday after Sunday there flocked to their lecture-room people from far around to listen to the exposition of the principles which were to renovate society. The villagers of the neighbourhood still talk of what "they Socialists did and taught"; and

now and then one or other of the community will revisit the spot, and speak in glowing terms of the far past happy days with a belief and enthusiasm that is still uncrushed by failure.

But "Harmony Hall" proved a misnomer. Separate individualities are not to be reduced to one dead level: the stronger will assert itself. Divided counsels naturally resulted in bad management; the farm ceased to be profitable; funds from outside sympathisers ceased to flow in; and the resources of the community became crippled. A school connected with the scheme - part of the original plan, for Robert Owen felt the necessity of the young generation being brought up from their childhood in the new doctrines - was given up; the adult members gradually dispersed; and, two or three years after its establishment, the big house stood empty. Thus it remained for a considerable time. At length the trustees of the property succeeded in letting it as an educational establishment, for which, by reason of its complete household arrangements and spacious grounds, it was well adapted. The name of "Harmony Hall" was now dropped, and that associated with the name of good Queen Bess was given to the new college. This name, from its having connected with it, either as masters or scholars, many men of high rank, is a familiar one, especially in the scientific world.

The yew still stands in the Boys' Playground, a memorial of the great Queen; while on one of the chimneys of the house, reminding of its origin and first object, in letters formed of flint amid the brickwork, we read - "C. of M., 1842." Lest some of our readers should fail to find out their meaning, we give the interpretation (a striking evidence of the earnest belief of the founders) - "Commencement of the Millennium, 1842."

We may add that the annual dinner of the Queenwood College Old Boys took place at the Criterion on the 15th inst., (actually December) the chair being taken by the Postmaster-General, Professor Fawcett.

N10.67.1881: Prominence at Royal Chemical Society

The *Hampshire Advertiser* for February 19 reported that at the last meeting of the Royal Chemical Society in London Dr. Hake, F.C.S., Professor of Chemistry at Queenwood College, in conjunction with Dr. Dupre, F.R.S., read a paper on "Organic matters in airs," Dr Angus Smith, F.R.S has worked on the question. "Drs Dupre and Hake recently devised a special process for estimating quantities of minute matter in air.

N10.68.1881: Old Scholars Reunion

The *Hampshire Advertiser* for July 23 carried this advertisement:

Queenwood College - Reunion of Old Scholars
From Saturday, July 30 to Monday, August 1
For particulars apply to the Secretary, G. H. Hoyle, Esq
36 Throgmorton-street, E.C.

N10.69.1881: Report of Reunion

The *Hampshire Advertiser* for August 06 duly reported on the Queenwood reunion.

Key points included:

- The “Unpropitious weather throughout” did not dampen enthusiasm.
- Old boys now have committees in Manchester and London.
- Those present included old boys who remembered the founding of the school.
- Dr. William Hake, the College Professor of Chemistry lectured on Saturday night on “Invisible Matter.”
- On Sunday there were full choral services, morning and evening, in the College Chapel.
- After the evening service, “Mr Milne, of Manchester, delivered a short and impressive address to past and present scholars on the text, ‘Will ye also go away? (John vi. 67)’”
- On Monday, Past and Present scholars met in a cricket match.
- The band of the 1st Hants Engineers was in attendance.

N10.70.1881: Old boys annual dinner

An advertisement in the *Hampshire Advertiser* for November 19 announced:

Queenwood College – The London annual dinner of Old Boys will take place at The Criterion, London, on Friday, the 25th instant.

N10.71.1882: Floreat Queenwood

Under the above heading, the *Hampshire Advertiser* for August 05 reported that:

It will be gratifying to the principal and pupils of Queenwood College to hear that the name of Mr F. Sherman Toogood, second son of Mr. W. Toogood of Southampton, and who was premier pupil of his year, 1880, appears in the first division of the list of successful candidates for the preliminary scientific (bachelor of medicine) examination held by the University of London. The subjects for examination were – Chemistry, experimental physics, botany and vegetable physiology, zoology and comparative anatomy. It may be mentioned in connection with this college that Professor Fawcett, of postal celebrity, was once a pupil here, and that Professors Tyndall and Debus, luminaries of the first order in the scientific world, have each held the science mastership of the college.

N10.72.1882: Invitation to British Association members

The *Hampshire Advertiser* for August 23, 1882 announced that on the next day it would publish a special edition covering the first day’s proceedings of the British Association’s Meeting in Southampton. Willmore was able to place this advertisement immediately before the Association’s announcement of its meetings:

BRITISH ASSOCIATION – Mr Willmore will be glad to WELCOME at QUEENWOOD COLLEGE any OLD PUPILS with their FRIENDS who may be visiting Southampton. Willmore repeated his invitation in the *Hampshire Advertiser* for August 26.

[That issue carried news of the British fighting in Egypt. It reported that:

Sir Garnet Wolseley routed an Egyptian force at Mahsameh Railway Station capturing twenty-five Krupp guns, 75 railway carriages and a large quantity of ammunition. He was fighting 10,000 Egyptians with ten guns whose fire was precise but British casualties few. Rumoured that Arabi Pacha has set a price on M. De Lesseps' head for false promises and intent to sell the Suez Canal to the British.]

N10.73. 1883: Etching of Queenwood College

An advertisement in the *Hampshire Advertiser* for June 23 stated:

ENGLISH ETCHINGS – The June Part (Number 25) contains a view of QUEENWOOD COLLEGE. To be had of any Bookseller, and of the Publisher, William Reeves, 185 Fleet-street, London. Price 3s 6d.

[An advertisement in the *Hampshire Advertiser* for June 30, 1883 illustrated the high utility of the Singer Sewing Machine. It could be bought for “£4 4s 6d less ten per cent for cash” or “hired for 2s 6d a week, with option of purchase”.]

N10.74.1884: Death of Post Master General

The Aberdeen Weekly Journal for November 7, 1884 and other newspapers reported the death on November 6 of the Postmaster General, of pleurisy and pneumonia. The notice included the sentence, “He was educated first at Queenwood College, Hants, under Professors Tyndall and Frankland, and then at King’s College, London.” G. H. Hoyle, secretary of the College Old Boys Association was quick to extend the reference to Queenwood College. In his letter to the Daily News, November 10, he wrote:

Sir – In your account of Professor Fawcett’s Life, I noticed that no allusion whatever is made to his school days. Some four years ago I was present at an annual dinner of the old scholars of a school where he was a pupil for three years, when Professors Tyndall and Frankland were masters there. Mr Fawcett was present at the dinner, and in fact, presided. I well recollect he attributed much of his own after success in life to the training he had received at this school, dwelling at the same time on his want of sympathy with the system of forcing in education which so often resulted in permanently weakened health. I think it but right to say that this school was Queenwood College in Hampshire. My attachment to the place must be my apology for this letter. G. H. HOYLE, Parliament Mansions, Westminster, Nov 8.

N10.75.1885: Biography of Henry Fawcett

During November, 1885, Leslie Stephen’s biography of Henry Fawcett which described Fawcett’s time at Queenwood College was widely reviewed.

N10.76. 1886: Old Boys’ Dinner

Advertisement in the *Hampshire Advertiser* for May 01 and 8 announced that the Queenwood College Old Boys dinner would take place on May 15. T. Coote, M.P. would be in the chair. Information from P. R. Cow, Jun., Blenheim, Streatham Common, S.W.

N10.77.1889: Reminiscences of old Blackburn

The *Blackburn Standard and Weekly Express* for January 2 reported Alderman Lund's memories which included his attending George Edmondson's school, Lower Bank Academy, in Blackburn.

N10.78.1889-90: Queenwood footballers win two games

The *Hampshire Advertiser* for November 09, 1889 and December 13, 1890 reported respectively that the Queenwood College footballers had defeated Havant Town and the Salisbury Wanderers.

N10.79.1891: Son of famous jockey

Hampshire Advertiser for April 15 carried a reference to "Mornington Cannon, jockey, the younger son of Tom Cannon, the famous jockey, who was educated at Bannister Court School, Southampton and Queenwood College."

N10.80.1892: Further endorsements

On June 11, 1892 Willmore inserted this endorsement advertisement in the *Hampshire Advertiser*.

QUEENWOOD COLLEGE, near STOCKBRIDGE, Hants

A high-class private school for boys

References to J. Ashby, Esq., J. P., The Bank, Staines; W. Crookes, Esq., F.R.S., 7 Kensington Park Gardens, W. G. Vivian Poore, Esq., M. D., 30 Wimpole-street, W.

The half-term commences 15th June.

J. Ashby has not been identified. No Ashby name appeared as a Queenwood student at the 1851, 1861 or 1871 Censuses nor is there any appropriate name in the DNB. Crookes, FRS and George Vivian Poore, MD, PhD were indeed illustrious.

From Brock's 2004c entry in the Oxford DNB, it may be seen that at the time Crooke's name appeared in the Queenwood advertisement Crookes was or had been President of the Institution of Electrical Engineers and the Chemical Society. He was elected FRS in 1863 and a medallist of the Royal Society in 1888. According to Brock, "Crookes life was one of unbroken scientific and business activity [...] his interests ranging over pure and applied science, economics and practical problems, and psychic research. All these interests collectively made him a well-known personality within the late Victorian scientific community." His house at the address mentioned in the advertisement "was the first house in England to be lit by electricity."

According to his DNB biographer, Cholmeley (rev. Hankins 2004), George Vivian Poore was destined to follow his father's career in the Royal Navy and attended a Royal Naval College from the age of ten to nearly seventeen when, deciding to be a doctor he took an apprenticeship with Dr. Luther Fox in the village of Broughton, about 1860. He thus came into contact with the Fox family which had provided Queenwood's first school doctor and four early Queenwood students and the village which provided facilities and scope for cultural activities with the school. By 1892

when his name appeared in Willmore's advertisement he had attended members of the Royal Family on their travels, become a professor of medical jurisprudence and clinical medicine, published books about electricity in medicine and surgery and medical jurisprudence and "was well known both to the medical profession and to the public as an ardent sanitarian."

N10.81. 1892: Blue Cross cyclists visit Queenwood College

The *Hampshire Advertiser* for August 13 described a visit by the Blue Cross cyclists on a run of 16 miles to Queenwood College where they were entertained by Mr. Willmore.

Mr Willmore showed his guests the gardens, gashouse, laboratory where Tyndall and others had demonstrated were all seen, as well as the play place and swings and open-air gymnasium. In the lecture hall, Mr Willmore described the history of Queenwood. He said Queenwood is named from the fact that our good Queen Bess occasionally visited the district, and her old yew tree in the grounds still stands, braving the atmosphere, although for years the bark has been gone.

N10.82.1893: Visit to Southampton

The *Hampshire Advertiser* for October 14 reported:

On invitation of Mr Aldridge, Queenwood masters and boys visited Southampton on Wednesday last, a very wet day: They visited the Free Library, the swimming baths, explored the fine, new steamship, the Nile and examined its electric crane; the Bartley Museum, the old Norman House and the ancient remains of the West Quay. Back to school by ten o'clock

N10.83, 1893: Death of Professor Tyndall

John Tyndall's death on December 4 was widely reported. Queenwood College was referred to in his obituaries.

N10.84. 1894: Death of Mrs. John Willmore

The *Hampshire Advertiser* for February, 07 included:

Death of Mrs Willmore
On the 19th January, at her residence, Amptill, Beds., Louisa Fanny, wife of John H. Willmore, formerly of Queenwood College, aged 59. Buried at Leighton Buzzard Cemetery.

N10.85. 1894: The final advertisements

In 1893-4 Willmore occasionally placed short advertisements with the final short advertisement in the *Hampshire Advertiser* for September 26, 1894. His final long advertisement appeared in the *Hampshire Advertiser* for May 12, 1894.

| QUEENWOOD COLLEGE – A high class boys' school

The buildings are very spacious and superior; the Grounds of great extent and beauty; the situation and neighbourhood unsurpassed for healthiness.

As to its educational record, Queenwood has been the nursery of some of the foremost men. Among teachers it counts Tyndall, Frankland, Debus; among its pupils, Fawcett, Hopkinson, Marcus, Beck.

For full particulars and references apply to

THE PRINCIPAL

QUEENWOOD COLLEGE, NEAR STOCKBRIDGE, HANTS

N10.86. 1895: Rain stopped cyclists.

The *Hampshire Advertiser* for 13 April reported a second visit to Queenwood by the Blue Cross cyclists was thwarted by rain.

N10.87.1895: Primroses around the College

In the same issue, 13 April, a correspondent to the *Advertiser* described the primroses growing around the College.

Willmore retired in 1896 and Queenwood College closed.