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RES MEDICA

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History of Medicine

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RES MEDICA

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Articles

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From Cover: The past and present at Old College.
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RES MEDICA
CCLXVIII

• THE ROYAL MEDICAL SOCIETY OF EDINBURGH, 5/5 BRISTO SQUARE, EDINBURGH, EH8 9AL •

Standing on the Shoulders of Giants

Cullen, Syme, Simpson, Lister, Littlejohn, Lauder Brunton, Dunlop; all names synonymous with the history of medicine, all names synonymous with the history of Edinburgh medicine, all names synonymous with the history of the Royal Medical Society.

When being educated in such a beautiful city such as Edinburgh, one feels the history seeping out from the walls. Nearly every lecture starts with history, and more often than not, Edinburgh was there. The Royal Medical Society is not immune from this. Just step into the Low Room and one is surrounded by over two hundred years of history – the Dissertations of our members dating back to the 1770's. There, everyone who has submitted a dissertation can be found, including most of the names mentioned above. One can pick up one of the weighty tomes and immediately be transported back to a time when medicine was little more than throwing stones in the dark and theories on this and that were two a penny. The handwritten dissertations are on many and varied topics, both medical and non-medical although it must be said that the earliest members had a particularly keen interest in how the female body works and functions.

Sometimes the history can get the better of the establishment. Who can forget the hounding of a member of this fine Society when he dared to suggest that one could hear two heart sounds instead of one? So much was that hounding that instead of taking a prestigious career path one would expect for such a pioneer, he became a local doctor in the North-East of Scotland.

This year is an important year for Edinburgh medicine. The Royal College of Surgeons which is just across the way from the Society's own rooms is to celebrate five hundred years of existence, far more then her English compatriot. The University is also not to be outdone this year with the tri-centenary of the Chair of Anatomy, a post currently held by a former Senior President of this Society and a frequent contributor to this journal.

However, history has taught us that change is essential to continued survival. Medical education has embraced the new internet age with the development of CALs, which stand for Computer Assisted Learning. In Edinburgh, the medical students use PathCAL, the development of which is described in this journal. This follows in the tradition of the teachers of old. Many of the old books that the Royal Medical Society still have are old teaching aids from hundreds of years ago. Our front cover shows just such an aid, this book being one of the few copies left in Edinburgh today. What is more, if you look carefully, you will see that the little sketch on the title page is of the same view as the location where the book is photographed. It is little things like this that make Edinburgh an exciting place to study medicine. While full of history, the medical school is still at the cutting edge of many subjects, and through this all the medical students benefit.

It is imperative that while medicine moves on apace and everything moves with it, the history that has helped such institutions gain their reputations be cherished. It is very easy to dismiss history as just old cloth, but once gone it can never be recreated. Everybody should make the effort to learn the history to allow it to flourish and continue throughout the ages to come.

Floreat Res Medica

The Annual Burns Night Supper at the Royal Medical Society of Edinburgh

Above: Mr Owen Dudley Edwards who gave the "Immortal Memory."

"Some hae meat and canna eat,
And some would eat that want it:
But we hae meat, and we can eat,
Sae let the Lord be thankit"

Robert Burns

On Monday 24th January 2005 the Royal Medical Society paid tribute to the celebrated bard Robert Burns. The supper, held in the Society's rooms at Bristo Square, was attended by no less than 94 people - the largest number this event has seen in a long while! With new and long-standing members alike gathering for the annual event, we can safely say that Robert Burns has not been forgotten within this Society!

Keeping with Burns Night tradition the evening began with the piping-in of the haggis, followed by the well known Selkirk Grace (quoted above) led by Miss Sam McDonald. With the enticing smell of delicious food in the air, our first guest speaker, the Reverend Professor Kenneth Boyd delivered a flawless execution of the "Toast to the Haggis".

Robert Burns wrote over 500 poems during his lifetime and thus our guest speakers had a wealth of material from which to pay tribute to the noble bard. Mr Andrew MacKenzie gave a chilling rendition of the well known Burns poem "Address to the Deil." Mr Owen Dudley Edwards was undeniably outstanding with his unforgettable 'Immortal Memory' in which the memory of Robbie Burns was reawakened and celebrated to the full.

There then followed a section of the evening which always has the audience quaking in their boots - the "Toast to the Lassies" and the "Toast to the Lads"! Mr Edward Dunn and Miss Penny Bantanidis respectively paid tribute to the qualities marking gender differences, whether noble or infamous, and thus upheld the spirit and vivacity of Burns Night.

The evening ended with Ceilidh dancing and of course many toasts to the Bard himself. It was an excellent evening and our thanks go out to the organiser Miss Jillian Kell for all her hard work.

Anticlockwise from Top: Mr Andrew MacKenzie with piper Mr Neil MacLaure; Cartoon drawn by Mr Andrew Moorehead in tribute to the other famous Burns; Mr Edward Dunn giving the "Toast to the Lassies"; Mr Edward Dunn and Miss Penny Bantanidis.

Sign Language Tutorials

Since the Michaelmas term the Royal Medical Society has been running tutorials in Sign Language at their rooms at Bristo Square. The courses are conducted by a governement funded agency for the deaf and run for 12 weeks at a time. These have proved immensely popular as the phrases taught are aimed particulary for use by medical students and doctors. They have been well attended and were many times over subscribed.

These courses have been established by the effort and hard work of buisness convenor Miss Sam McDonald.

The Annual Pool Competition

On the 7th March 2005 the Royal Medical Society hosted the annual Pool Competition. This is usually a highly competitive event and even more so this year as 16 competitors battled it out for pride and fame.

The competition was slightly different this year as, due to the timing of the event, it was decided that all proceeds would go to the Comic Relief Fund. The night was full of dramatic turns and events as many a favourite fell at the early stages. As the night drew to an end, the list of competitors to the title were whittled down to just two. The final would be fought by the editor of this fine journal and a PBL facilitator, whom a group of first year medical students had managed to entice to the event. The winner after a long and tense match was Miss Catherine Webb who took away the prize of a small barrel of Stella Artois beer.

Mulled Wine and Minced Pies

At the end of the Michaelmas term, the Society held its annual Mulled Wine and Mince Pies evening. This is a good time for members past and present to meet and mingle in the pleasant surroundings of the Society's rooms in Bristo Square. This year was no different. It was a pleasant sight to see students having lengthy conversations with such eminent members as Professors Matthew Kaufman and Brian Frier, especially as those conversations were strictly non-medical. Once again thanks must go out to Miss Jillian Kell for organising the evening and to Miss Michelle Arora for her excellent mulled wine

The Second Hall

The Royal Medical Society is appealing to her old members and other interested parties for colour pictures of the Second Hall, which was on Melbourne Place. As many may remember, this hall was bought by Midlothian Council in the 1960's and subsequently demolished. The Society has pictures of both the interior and exterior of the Hall, however all in black and white. If the Society had some colour photographs, it has the software to artificially colour some of its own photographs so as to give a better appreciation of the style and splendour of the old Hall.

If old members are able to help or have information that may be helpful, they can contact the office between the hours of 12-5pm Monday-Friday on 0131 650 2672 or alternatively write to the Permanent Secretary, The Royal Medical Society, 5/5 Bristo Square, Edinburgh, EH8 9AL.

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Lessons from Medical History - Occupational and Environmental Diseases

ANTHONY SEATON

Emeritus Professor of Environmental and Occupational Medicine, University of Aberdeen

Honorary Consultant, Institute of Occupational Medicine, Edinburgh.

c/o The Royal Medical Society of Edinburgh, 5/5 Bristo Square, EDINBURGH, EH8 9AL

Two sorry stories.

In about 1990, two middle aged men died in Aberdeen Royal Infirmary from a fibrotic lung disease. I was asked to see the second of these men in his terminal illness and found that both had been working as stonemasons on Elgin cathedral, employed by Historic Buildings, Scotland. A visit to the workplace showed that they and their colleagues had been and were being exposed to very high concentrations of fine quartz dust from the use of powered tools on sandstone. There was no local exhaust ventilation to extract dust and the respirators provided were inadequate. Post mortem studies showed the two men to have died from acute silicosis, a condition not described in modern times in Britain. Fortunately, it was possible to prevent further serious illness in the remaining masons by appropriate action.

In 1995 a 40-year old stonemason presented to the rheumatology clinic at the Western General Hospital with painful, cold hands. He had been working for decades renewing Georgian houses in the New Town. I was asked to see him because his chest radiograph showed nodular and massive fibrosis; these changes were characteristic of advanced silicosis. His painful hands were a consequence of scleroderma. He had to leave his job and has subsequently retrained.

An interest in medical history is an indication of an inquisitive mind, the same sort of attitude that predicts success in clinical practice or scientific research. If, as you read a temperature chart or use your stethoscope, you ask yourself who first thought of taking a patient's temperature or of categorising the noises in the thorax and then take the trouble to find out, you are the sort of person who will do well in medicine. Diagnostic skill and the ability to find unsolved problems and perceive their solution both depend upon the child-like inquisitiveness that Rudyard Kipling described in the Just So Stories:

I keep six honest serving men
(They taught me all I knew);
Their names are What and Why and When
And How and Where and Who.

Environment and health: the original concepts.

Throughout history, there have been two rival concepts of disease causation, the imbalance of humours and attack by demons. The first refers to something innate in the body that determines personality, behaviour and susceptibility to disease, the vital spirit or "pneuma". To Aristotle and Galen in Greco-Roman times this came to mean too much blood, bile or phlegm and led, *inter alia*, to blood-letting as a cure. This concept persisted through the Middle Ages and held back understanding of illness until the Renaissance and the anatomical and physiological studies of Vesalius (1514-64) and William Harvey (1578-1657). The second probably arose in pre-history and animalistic times but received a boost from Christian belief, attributing disease to attack from without by malign spirits. Echoes of both these concepts are still heard today and the general ideas actually still hold true. Today's Galenists, unknowingly, are those geneticists who claim that my DNA determines my behaviour and predicts my future health. Today's demonists are people like me, who argue that the environment is the principal determinant of health and mortality. And, of course, both have hold on an element of truth.

De causis et sedibus morborum: how the body works and how it goes wrong.

The 18th century saw an extraordinary rise in scientific understanding that revolutionised medicine. Dissection of the body, pioneered by Vesalius, allowed doctors to learn anatomy and the experiments of Harvey led to an understanding of how it worked, physiology. The first great account of how disease affects normal structures, pathology, came from the work of Morgagni (1682-1771). The discovery by Priestley (1733-1804) of what was later called oxygen (which is as close as we have come to determining the character of the ancients' pneuma) allowed the possibility of understanding metabolism, and this in turn was built on by the great discoveries in chemistry of the 19th century. The experiments of the Abbé Mendel (1822-84) began to explain the mechanisms behind the theory of Darwin (1807-82) on evolution. This spirit of enquiry into the works of nature is the foundation of all the scientific and medical understanding that we now so easily take for granted.

Morgagni called his great book "De causis et sedibus morborum" – on the causes and seats of disease. This demonstration that the cause of disease lay within one was a stimulus to the humoral imbalance theory, and pursuit of this idea has now led to the dramatic discoveries of molecular and cell biology, DNA and the genomes of an increasing number of organisms including human beings. But also, in the 18th and 19th centuries, came the demonstration of the value of scientific study of the relationships between the environment and health. James Lind (1716-94), an Edinburgh surgeon, showed the importance of fresh fruit in preventing scurvy, doing the first controlled trial in the process. Edward Jenner (1749-1823) built on the empirical observations of others by experimentally developing an effective vaccine for smallpox from cowpox pustules. John Snow (1813-58) showed the relationship between contaminated drinking water and risk of cholera, and demonstrated the practical relevance of epidemiology by removing the pump handle to cut short the epidemic in Broad Street, London. Louis Pasteur (1822-96), originally a chemist, developed the science of microbiology and laid the scientific basis for producing effective vaccines, without which some of you might well not have survived childhood to read this article or I to write it. But long before such scientific methods were applied to the study of environmental effects on health, empirical observations had begun to support the demonic theory. Indeed, Hippocrates (c400BC), the father of medicine, had written of the occurrence of epidemics and promoted ideas of preventive public health. In the Middle Ages, some doctors had noticed that certain jobs were particularly unhealthy – Georg Bauer or Agricola (1494-1555) had drawn attention to the short life span of Bohemian metal miners, for example. The flowering of scientific understanding in Renaissance Italy, where Harvey went to study, included systematic observations by Bernardino Ramazzini (1633-1714), professor of medicine in Padua, on the diseases of different trades, and this was a theme taken up by Charles Thackrah (1795-1833), one of the founders of the Leeds School of Medicine, in the early 19th century. He even mentioned diseases of students in his book, including, "...A highly excitable state of the nervous system,...irritability of temper, vain fear and anxiety about trifles..." that he attributed to long periods of study without adequate exercise. We now call it "stress".

The 18/19th centuries saw a revolution in industry, great national prosperity, and increasing longevity but, paradoxically, a rise in epidemic diseases as cities grew and overcrowding and poor sanitation became a huge problem. Awareness of this imbalance gave rise to the concept of professional idealism, that the well educated and fortunate in society owed a debt that could be repaid by devoting themselves to amelioration of the lot of those less fortunate, a concept enunciated by Priestley as the pursuit of "the greatest happiness of the greatest number" and formulated as the Utilitarian Philosophy of Jeremy Bentham (1748-1832). This intellectual climate, in which the Scottish Enlightenment and Edinburgh

University played an important role, led to control of these diseases by public health measures (including the great Victorian water engineering works that have lasted up to the present time and are only now needing replacement). The classical occupational diseases, lead and mercury poisoning, silicosis and coalworkers' pneumoconiosis, were well described, and the first causes of cancer were discovered; interestingly, these were all occupational. First, Percivall Pott (1714-88), a London surgeon, described scrotal cancer in chimney sweeps' apprentices in 1766. Then, late in the 19th century, scrotal cancer was described in west Lothian oil shale workers by Joseph Bell (1837-1911), an Edinburgh surgeon and the model for Conan Doyle's Sherlock Holmes, while in Germany Härting and Hesse described lung cancer in metal miners (now known to be due to radon gas exposure) and Rehn described bladder cancer in chemical dye workers (now known to be due to absorption of aromatic amines). Ironically, it was these dyes that formed the basis of the studies by Paul Ehrlich (1854-1915) into chemotherapy and led to the development of the first effective antibacterial agents. And all these discoveries led in due course to the enactment of public health measures, legislation and regulation intended to prevent them; this is the objective of research into environmental and occupational disease.

A rolling road, a reeling road: from observation to prevention

The author GK Chesterton wrote a poem about the winding English road, made by the rolling English drunkard, and I have often thought of this as I have considered the many pitfalls between observation of an association of disease with an environmental cause and implementation of effective preventive action. Three such associations are worth considering before I return to the unfortunate patients I briefly described in my introduction.

Asbestos. Although asbestos has been used for fireproof materials since ancient times, it became a major industrial material right at the end of the 19th century and was used in Britain and most other industrial countries until very recently. It found many applications in strengthening other materials such as cement and plastics, in fire prevention and in sound-proofing. Up until the 1970s it was very widely used in buildings and ships, and it is still present in many buildings of that era and before. The first evidence that it was harmful came from reports of a progressive lung fibrosis in asbestos millers at the very end of the 19th century. By 1930 this was well established as the disease asbestosis and regulation to reduce exposure in factories was enacted. But also by this time, the industry was receiving alarming indications that some of its workers were dying of cancer and in 1950 the high risk of lung cancer in people with asbestosis was established by Sir Richard Doll (born 1912, and still working every day at the age of 92 – an example to all students who turn up late for lectures) and his colleagues. This was not all, since the industry was also aware of another fatal malignant condition of the pleura and peritoneum, mesothelioma, occurring in workers, early examples of which had been noted in Glasgow shipyard workers in the 1940s. There is evidence that the industry took the ostrich approach to this alarming suspicion, but in 1960 a pathologist in South Africa, Chris Wagner (1923-2000), described a high risk of mesothelioma among workers mining and milling blue asbestos. The hope of industry was that this disease only occurred in highly exposed workers, but sadly this proved not to be the case. By the time effective legislation was first introduced in the UK in 1969, many tens of thousands of industrial workers in shipyards, construction, engineering and countless other occupations had been exposed to sufficient to imply a real risk of development of the disease. Indeed, a man born in the 1940s has a 1% overall lifetime risk of mesothelioma; if he has been a shipyard worker that risk is about 7%. Today some 2000 people each year die of mesothelioma and this number is likely to rise for another 10 or 15 years until the effects of the cessation of asbestos use in 1980 has taken effect, since the disease has a latent period from first exposure to tumour development of many decades.

The lesson from asbestos is that a powerful industry is able to prevent effective legislation if it fears that its interests will be harmed. One way it does this is by diverting research from epidemiology (to quantify exposure-disease relationships) towards understanding mechanisms by animal experiment, and there is evidence that this is what the asbestos industry did. In the long run the consequence was, apart from tens of thousands of deaths, the demise of the industry and many of their insurers.

Smoking. It is difficult to believe that there was a time when the link between smoking and lung cancer was not obvious, but such is the case. In fact, lung cancer was relatively uncommon before the 1939/45 War, since smoking of manufactured cigarettes began in a big way in the trenches of the 1914/18 War (incidentally, women started smoking seriously in the Second World War when they went to work in the factories). In the early 1950s, Richard Doll started to investigate the rise in lung cancer, thinking it might be due to industrial pollution. His famous paper published in 1956, the year I went to medical school, showed its very strong relationship with smoking, and our governments have had no excuse not to legislate against the tobacco industry ever since. However, the tax derived from tobacco and the sponsorship of politicians, arts and sports by the industry have provided an object lesson in how altruistic legislation may be prevented. We now know that smoking makes an important contribution to the cause of many different cancers, from leukaemia to bladder cancer, and of heart attack, peripheral vascular disease and stroke. And yet Bernie Ecclestone, of motor racing wealth, was easily able to persuade our current Government that his 200mph cigarette advertising boards are perfectly acceptable on our TV screens. And have you noticed number of film and TV actors smoking on camera recently? You can bet that someone is paying them to do so, to influence the young.

Although men in general have now begun to get the message about smoking, this is unfortunately not true of women, and the lung is now the main site of cancer among them. We know how to prevent it, we know why people keep smoking (nicotine is seriously addictive), but we have been very slow to take effective action. We are up against an industry that is richer than many countries and more ruthless and less moral than the worst African republic. Let us hope that Scotland will soon follow Ireland and California in banning smoking in public places.

Vinyl chloride monomer. It is perhaps worth telling one tale about things going right, since this does happen occasionally. Polyvinyl chloride, or PVC, became a ubiquitous material in the 1950s and 1960s. It is made by polymerising vinyl chloride, a narcotic chemical that was once suggested as an anaesthetic. Such a simple chemical was not initially considered particularly harmful, but in the 1970s a few workers at a factory in the US developed a rare liver tumour, angiosarcoma. The factory doctor was alarmed and persuaded the industry to commission research on rats; this demonstrated that vinyl chloride caused the same tumour in them. The message rapidly went round all the PVC-producing industry that exposure to the monomer was potentially fatal, and steps were taken to enclose processes and prevent exposure. Happily, this was possible (although at some capital expense) without destroying the industry, and very few further cases of angiosarcoma have occurred since the initial outbreak.

To return to the beginning.

The disease silicosis was described as the cause of lung disease in stone-cutters and grinders in the 18th century, and lung disease was known in miners centuries before that. It was a particular risk to the knife manufacturers of Sheffield, who were known to die early as a result and, because it was common in many trades such as mining and tunnelling, it was one of the first diseases in Britain that allowed the sufferer to claim Industrial Injuries Benefit. We have known how to prevent it (stop people inhaling quartz dust by enclosure of processes, exhaust ventilation and if necessary respiratory protection) since the 19th century. And yet cases still occur, always through neglect of simple precautions. In the case of the Elgin stonemasons, the men were aware that the dust was dangerous and had asked for steps to be taken to reduce concentrations, but their managers had deferred doing so on the grounds, apparently, of cost. These managers were presumably unaware of the risks, silicosis being a disease that has largely been prevented and had thus become rare; legally they didn't have a leg to stand on.

The case of the man with scleroderma was particularly interesting, since in 1914 an Edinburgh physician, Byrom Bramwell, described for the first time an association between scleroderma and exposure to stone, among masons working on the New Town. His case reports of workers he had seen in the late 19th and early 20th centuries, which you can read in the Edinburgh Medical Journal of that year (1914;12:387), recount almost exactly the occupational history that I obtained from my patient. It is

even quite possible that they had worked on some of the same buildings. In over 100 years, nothing had changed.

So, what's in it for you?

We have evolved within our environment, and it is reasonable to suppose that, wherever we live, our internal milieu is somehow matched to our external. Things begin to go wrong with radical environmental change; this is most obvious of course with floods, war, famine and so on. More subtly, changes to diet from the efforts of the food industry or changes to the structure of work and play may influence our health. For me, interest is aroused when I hear of a disease being on the increase or decrease. Such changes occur when populations move, as in times of war or revolution, or over time with natural or induced changes to the environment. Think for example of the rise in skin cancers associated with the increased ability of UK citizens to afford holidays in the sun. Think of the current increase in cirrhosis in young women associated with the ready availability of cheap alcohol and relaxing of the taboo on female drunkenness in public. The recent rise in asthma and allergies seemed to me to be related to very substantial changes in the population's diet, perhaps by modifying susceptibility; could these be connected? Our current research in Aberdeen suggests strongly that some components of maternal diet in pregnancy and of early childhood diet do indeed modify the risks of these diseases. The occurrence of Parkinson's disease in certain drug abusers suggested that similar neurotoxic substances used as pesticides might have similar effects; our recent study in five European countries has shown exposure to them to be a significant risk factor for the disease.

The story of the gradual elucidation of the relationships between the environment and health is an unfinished one. From my own perspective, I should like to continue to disentangle the relationships between asthma, vitamin E and selenium. Do these nutrients influence immune development and expression of asthma genes? Can we find evidence that improving diet prevents asthma? I should like to know what environmental factors are responsible for the increase in Alzheimer's disease. I should like to know whether infecting organisms cause rheumatoid arthritis and other collagen or arteritic diseases. In these and all other unsolved mysteries in medicine, the cause is an interaction between genes and the environment, between the humours and the demons. Therein lie the opportunities for you, the next generation. Do not forget the demons!

A book to ask for, for your birthday.

Roy Porter. *The Greatest Benefit to Mankind: a medical history of humanity from antiquity to the present.* London, Harper Collins, **1997**.
ISBN 0002151731


HIPPOCRATE DUCE NATURÆ MINISTRO
SOC:REC:MED:EDIN

Two Diplomas Awarded to George Joseph Bell now in the Possession of the Royal Medical Society

MATTHEW H. KAUFMAN

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Introduction

The two earliest diplomas in the possession of the Royal Medical Society were both awarded to George Joseph Bell, BA Oxford. One of these diplomas was his *Extraordinary Membership Diploma*[1] that was awarded to him on 5 April 1839. Very few of these Diplomas appear to have survived, and the critical introductory part of his Diploma is inscribed as follows:

Ingenuus ornatissimusque Vir Georgius Jos. Bell *dum socius nobis per* tres annos *interfuit, plurima eademque pulcherrima, haud minus ingenii felicis, quam diligentiae insignis, animique ad optimum quodque parati, exempla in medium protulit. In quorum fidem has literas, meritis tantum concessus, manibus nostris sigilloque munitas, discedenti lubentissime donatus.*[2] Edinburgi 5 Aprilis 1839.[3]

Extraordinary membership of the Society was usually awarded to Ordinary Members of the Society who had diligently attended the meetings of the Society for at least two years, read a Dissertation and a comment on a case, and paid all of their outstanding debts. According to Gray,[4] in the early part of the nineteenth century they were also obliged to have delivered a second set of papers. On this occasion, Bell's Diploma indicates that he had been a Member of the Society for a period of *three years* when he was awarded his Diploma. While he delivered one Dissertation in 1839 that was bound into the appropriate volume retained in the Society's Library (see below), he also fulfilled the other requirements expected of an Extraordinary Member as required by the Laws of the Society at that time.[5] Such Members enjoyed all of the privileges enjoyed by Ordinary Members, but were not required to attend meetings. Substantial problems were encountered by the Extraordinary Members of the Society in March 1808, when a motion was passed at an ordinary meeting of the Society, that they should no longer be eligible to vote at the election of Presidents. It was suggested that as they did not regularly attend meetings of the Society, they were not adequately familiar with its activities. The Extraordinary Members immediately sought Counsel's opinion on this matter, and at an ordinary meeting of the Society held on 22 April 1808, and as a result of the advice they were given, the motion was subsequently withdrawn.[6]

The date of award of the *second* of these Diplomas is somewhat curious, because he was Senior President during the Society's 103rd Session (1839-40).[7] He was elected to this office by a majority of the votes at the meeting held on Friday 29 November 1839.[8] This presumably relates to the date that appears on his Senior President's Diploma. It is unclear on what evening the Annual Dinner was held that year, as this varied from year to year, as apparently did the venue for this event. Despite this, his *Senior President's Diploma* appears to have been awarded to him on 11 February 1842. One possibility is that he was unwell or was away from Edinburgh for some reason and was therefore unable to attend the Annual Dinner when he would normally have been expected to receive his Senior President's Diploma in 1839.[9] No mention is made of this episode in the Society's *Minute Book*.

Who was the recipient of these Diplomas?

The fact that he was named *George Joseph* Bell indicated that he might have been one of the sons of Professor George Joseph Bell, Professor of the Law of Scotland in the University of Edinburgh.[10] Professor George Joseph Bell was Charles Bell's mentor and older brother. They wrote to each other on a frequent basis and items from this correspondence between them were selected by Charles Bell's wife, Lady Bell, and published in 1870, long after both of them had died.[11] The fact that the recipient of these Diplomas was one of the sons of Professor Bell was confirmed when the Archives of the University of Oxford were consulted. These indicated that George Joseph Bell *junior* was indeed the *second* son of Professor George Joseph Bell, of Edinburgh.[12] He had matriculated at Balliol College on 25 February 1833 at the age of 20, having been born on 19 August 1812, and graduated with the Oxford BA degree in 1836. He subsequently obtained the Oxford MA degree in 1842. More interestingly, he also graduated with the Oxford BM degree in 1842.[13] Despite studying medicine in Edinburgh during the period between 1836-37 and 1840-41, there is no record that he was either awarded the LRCS Edin. diploma,[14] or graduated with the Edinburgh MD degree.[15] The fact that he graduated with the Oxford BM degree in 1842 suggests that he was probably obliged to pass their written and viva examinations in order to graduate with their degree.

He signed the Obligation of Membership of the Royal Medical Society on 27 January 1837.[16] An analysis of the Society's Volumes of bound Dissertations revealed that he read his Dissertation before the Society on 4 January 1839. The topic of his Dissertation was "*On the spontaneous obliteration of arteries*." By the standards of the day, it was a fairly lengthy Dissertation, covering 69 pages of hand-written text. Up to 1832, when the post was discontinued, an amanuensis, or semi-professional scribe, termed a "Transcriber" would have prepared the text of the Dissertation that was bound in the volume that was retained in the Society's Library. The author would then have signed the Dissertation. This was to confirm that it was a true transcription of his text. According to the 1823 *Laws of the Society* then still in force,[17] the Member had to present the Transcriber with the draft of his Dissertation some weeks in advance of the Meeting when the Dissertation was to be presented before the membership. The Transcriber then prepared two copies. One was presented to the Society and bound and retained in the Society's Library, while the other copy was circulated to all of the Members who had previously indicated that they wished to read a copy of his Dissertation in advance of its delivery before the Society. According to the *Laws of the Society*, their Porter only delivered these Dissertations to Members who lived within a short distance of the Society's premises. This was to allow them to prepare appropriate questions to be presented to the Member after he had delivered his Dissertation.[18] In 1839, the Dissertations that were bound and retained in the Society's Library were written by the Members themselves.

His *Extraordinary Membership Diploma* was almost certainly presented to him at a special celebratory Dinner held on 5 April 1839, although it is unclear how many others received Extraordinary Membership Diplomas at this Dinner. Bell's Diploma was signed by the four Presidents elected during the Society's 102nd (1838-39) Session. It is interesting to note that 20 of those who signed either his Extraordinary Membership Diploma or his Senior President's Diploma or both subsequently became extremely distinguished individuals, and abbreviated biographies of these men were later published in the *Dictionary of National Biography*. Interested readers will find the relevant references to these biographies in the Endnotes section.

The four Presidents of the Society during the Society's 1838-39 Session, and who signed his Extraordinary Membership Diploma were:
Samuel Wright, (Nottingham, signed Obligation of Membership on 14 April 1837, Senior President), MD Edin. 1840.

Alexander Wood, (Fifeshire, signed Obligation of Membership on 22 April 1836, First Junior President), LRCS Edin. 1838, MD Edin. 1839, FRCP Edin. 1840, founder Member of the Edinburgh Obstetrical Society, 1840, Secretary RCP Edin. 1850-56, President RCP Edin. 1858-60.[19]
Randle Wilbraham Falconer, (Bath, signed Obligation of Membership on 25 November 1836, Second Junior President), MD Edin. 1839, Honorary MD Queen's University, Ireland. 1879.[20]
Thomas Bazett Tytler, (Edinburgh, signed Obligation of Membership on 16 December 1836, Third Junior President), LRCS Edin. 1839, MD Edin. 1839, FRCS Edin. 1841. He accidentally drowned a few weeks after he obtained his FRCS Edin. diploma in August 1841.[21]

What is particularly curious about George Joseph Bell *junior* is that he appears to completely disappear from the scene either in 1842 or some time after he gained his Oxford BM degree. In order to try to establish his fate, his father's Will was checked to see whether this might shed any light on the matter, as his father died on 23 September 1843. While his Will was registered in the Edinburgh Sheriff's Court on 17 February 1844, his last Will was, however, dated 14 February 1840. While his wife had died in 1827, all of their 10 children were still alive in 1840, and were all mentioned in his 1840 Will.[22] According to information supplied by Balliol College, Oxford, George Joseph Bell *junior* died in 1847, but no additional information regarding his premature death has yet been found.[23]

The two principal guests when Bell was presented with his Extraordinary Membership Diploma, who were probably also invited to speak after the Dinner were:
Professor Sir Charles Bell, FRCS Edin. 1799, Honorary Member of the Royal Medical Society, 24 February 1826, Extraordinary Member of the Society, FRS London 1826, KH 1830, Professor of Surgery, Edinburgh, 1836-42. He died on 28 April 1842 at Hallow Park in Worcestershire.[24] It is of interest to note that the recipient of this Diploma was one of Sir Charles Bell's nephews.
The other senior guest was **Professor Robert Christison**, (Edinburgh, signed Obligation of Membership on 17 December 1819, Extraordinary Member, Honorary Member 1843), MD Edin. 1819, President RCP Edin. 1838-40 and 1846-8, Professor of Medical Jurisprudence, Edinburgh, 1822-32, Professor of Materia Medica and Therapeutics, Edinburgh, 1832-77, created Baronet in 1871.[25]

Seventeen other Members of the Society, or Guests of the Society, also signed the Diploma. Of these, it is possible to trace with little difficulty the following fourteen individuals:
John Abercrombie, MD Edin. 1803. He was never an Ordinary Member of the Society, but was elected an Honorary Member in 1831. According to Professor John Goodsir, he was a great physician and extremely rich.[26]
John Hutton Balfour, (Edinburgh, signed Obligation of Membership on 14 December 1827, First Junior President, 1830-31, Third Junior President, 1831-32), LRCS Edin. 1829, MD Edin. 1831, FRCS Edin. 1833, FRS Edin. 1835, FRS, Professor of Botany, Glasgow, 1841-5, Professor of Medicine and Botany, Edinburgh, 1845-79.[27]
George Edward Day, MA Cambridge, 1840 (Pensioner Trinity College, 11 March 1833, migrated to Pembroke College, 5 February 1834),[28] (Cambridge, signed Obligation of Membership on 7 December 1838, Senior President, 1840-41), Licentiate in Medicine of the University of Cambridge, 1843,[29] MRCP London 1844, FRCP London 1847, Chandos Professor of Anatomy and Medicine, St. Andrews, 1849-63, Honorary MD Giessen 1849, FRS London 1850.[30]
Herbert John Giraud, (Kent, signed Obligation of Membership on 10 November 1837), MD Edin. 1840.[31]
Peter David Handyside, (1808-81), (Edinburgh, signed Obligation of Membership on 18 November 1825, Senior President, 1828-29), MD Edin. 1831, FRCS Edin. 1833. For about 45 years, he was a surgeon and teacher of Anatomy and Surgery at the Extra-mural School.[32]
Robert Jameson, (signed Obligation of Membership on 10 January 1795, Honorary Member 1850), Regius Professor of Natural History, Edinburgh, 1804-54, Founded Wernerian Natural History Society, 1808, Founded Edinburgh Philosophical Journal, 1819.[33]
Andrew Douglas Maclagan, (1812-1900), (Ayrshire, signed Obligation of Membership on 27 March 1829, Second Junior President, 1832-3), LRCS Edin, 1831, MD Edin. 1833, FRCS Edin. 1833, Professor of Medical Jurisprudence, Edinburgh, 1862-97.[34]
George Paterson, (Stockholm, signed Obligation of Membership on 13 November 1829, Senior President, 1832-33), MD Edin. 1833, LRCS Edin. 1833, MRCP Edin. 1833, FRCP Edin. 1837, founder Member of the Edinburgh Obstetrical Society, 1840, Secretary RCP Edin. 1848-50.
David Boswell Reid, (Edinburgh, signed Obligation of Membership on 18 April 1823, Senior President, 1826-27), MD Edin. 1830, FRCP Edin. 1831.[35]
John Reid, (Linlithgowshire, signed Obligation of Membership on 4 April 1834, Third Junior President, 1835-36), MD Edin. 1830, Professor of Medicine, St. Andrews University.[36]
James Young Simpson, (Linlithgow, signed Obligation of Membership on 4 April 1833, Senior President, 1835-36, Honorary Member 1850), MD Edin. 1832, Professor of Midwifery, Edinburgh, 1840-70, President RCP Edin. 1846-8, created Baronet in 1866, the first given to a doctor practising in Scotland.[37]
James Syme, (Fifeshire, signed Obligation of Membership on 8 January 1819, Honorary Member 1843), MRCS London 1821, FRCS Edin. 1823, Hon. MD Dublin 1867, Hon. MD Bonn 1869, DCL Oxford 1869, Regius Professor of Clinical Surgery, Edinburgh, 1833-69.[38]
Allen Thomson, (signed Obligation of Membership on 21 April 1826, Second Junior President, 1829-30), MD Edin. 1830, FRCS Edin. 1831, Professor of Anatomy, Marischal College, Aberdeen, 1839-41, Professor of Physiology, Edinburgh, 1842-8, Professor of Anatomy, Glasgow, 1848-77.[39]
Thomas Stewart Traill, (signed Obligation of Membership on 4 December 1801), MD Edin. 1802, FRS Edin. 1819, FRCP Edin. 1833, President RCP Edin. 1852-4, Professor of Medical Jurisprudence, Edinburgh, 1832-62.[40]

The fate of three additional individuals who appended their signatures to the Diploma has so far not been traced although at least one of these individuals attended the Dinner in his capacity as an Ordinary Member of the Society:
Alexander Graham
Martin Roberts (Carmarthenshire, signed Obligation of Membership on 7 December 1838).
William Robertson

George Joseph Bell Junior's Senior President's Diploma
As indicated previously, although George Joseph Bell *junior* was Senior President during the Society's 103rd Session (1839-40), the date on his Diploma, that corresponded to when it was awarded to him, was 11 February 1842. It is now difficult to understand why there should have been such a delay between when he was Senior President of the Society and when he was awarded his President's Diploma, unless he was unwell, or was away from Edinburgh, during the interim period. The University's Matriculation Album for the years 1836-37, 1837-38, 1838-39, 1839-40, and 1840-41 was checked. This was to establish whether he was in Edinburgh and attended the requisite medical classes during these sessions. This indicated that he had paid the Matriculation Fees during four of these five Sessions. The exception was for the 1839-40 Session when his name did not appear in the Matriculation List. During 1836-37 (Matriculation Number 940), he signed up to attend *Anatomy*, *Practical Anatomy* and *Surgery*. During 1837-38 (Matriculation Number 137), he signed up to attend *Surgery*. During 1838-39 (Matriculation Number 318), he signed up to attend *Obstetrics*, *Materia Medica* and *Surgery*. In 1840-41 (Matriculation Number 266), he paid the Matriculation Fee, but (as was not unusual at that time) no classes were listed against his name. While no information is available to confirm this, he may also have attended other classes in the University, as was common at that time. Equally, he may have attended classes at one or more of the various Extra-mural Medical Schools that flourished in Edinburgh at that time.[41]

The critical introductory part of his Senior President's Diploma is inscribed as follows:
Ingenium ornatissimumque Virum Georgium Josephum Bell, *ut qui nullis non ingenii opibus instructus primas apud nos merito sibi vindicaret, haud indignum judicavimus quem ad honorificum Praesidis annui munus, Comitiis ad id habitis,* 29 Nov. 1839 *eveheremus: evectum nec rebus nostris nec suae ipsius famae defuisse his Literis, manibus nostris nostroque Sigillo munitis lubentissime omnibus testamur.*
Edinburgi, Anno Domini 1842, die Februarii 11.

His *Senior President's Diploma*[42] was signed by three of the elected Presidents for the Society's 105th Session (1841-42). It was signed by the Senior President, and the First and Second Junior Presidents. These were:
John Goodsir (1814-67), (Fifeshire, signed Obligation of Membership on 8 November 1833, Senior President, 1841-42, Senior President 1842-43), LRCS Edin. 1835, Professor of Anatomy, Edinburgh, 1846-67.[43]
Henry Lonsdale, (Cumberland, signed Obligation of Membership on 27 November 1840, First Junior President, 1841-42, Third Junior President, 1842-43), MD Edin. 1838.[44]
Edwin Thorne Wait, (Bristol, signed Obligation of Membership on 22 January 1841, Second Junior President, 1841-42), MD Edin. 1843.

The only President that did not sign this Diploma was the Third Junior President. This was initially **William Scott Carmichael**, (Edinburgh, signed Obligation of Membership on 14 December 1838), MD Edin. 1835. He had been elected to this post, but had resigned on 9 February 1842 and was replaced some days later by **William Mackinnon** (Aberdeen, signed Obligation of Membership on 8 January 1841). In the place where the Third Junior President usually inserted his signature, **Andrew Wood** (Edinburgh, signed Obligation of Membership on 16 November 1827, Second Junior President, 1830-31), MD Edin. 1831, Honorary Secretary of the Society, had appended his signature.

As on the Extraordinary Membership Diploma, the two principal Guests at the Dinner when he was presented with his Senior President's Diploma were Professors **Sir Charles Bell** and **Robert Christison**. Amongst the other signatories, a considerable number had previously signed his Extraordinary Membership Diploma in 1839. These were the following:
John Abercrombie
George Edward Day
Robert Jameson
Andrew Douglas Maclagan
Sir James Young Simpson
James Syme
Allen Thomson
Thomas Stewart Traill

The other individuals who signed his diploma were:
William Pulteney Alison, (Honorary Member 1841), MD Edin. 1811, Professor of Medical Jurisprudence, Edinburgh, 1820-21, Professor of Institutes of Medicine (Physiology), Edinburgh, 1821-42, Professor of Medicine, Edinburgh, 1842-55, President RCP Edin. 1836-38.[45]
Sir George Ballingall, (Honorary Member 1841), LRCS Edin. 1805, MD Edin. 1819, FRCS Edin. 1820, FRS Edin. 1820, President RCS Edin. 1836-38, Regius Professor of Military Surgery, Edinburgh, 1822-55, Knighted on the accession of William IV, 1830.[46]
Hugo Francis Clarke Cleghorn (1820-95), (Fifeshire, signed Obligation of Membership on 10 November 1837, Honorary Secretary, 1840, Second Junior President, 1840-41), MD Edin. 1841.
Andrew Halliday Douglas (Edinburgh, signed Obligation of Membership on 21 April 1837), MD Edin. 1840, he taught Medicine at the Extra-mural School from 1848-54, President RCP Edin. 1869-71.
Robert Graham, (signed Obligation of Membership on 8 November 1805, Honorary Member 1843), MD Edin. 1808, Professor of Botany, Glasgow, 1818-20, Regius Professor of Botany, Edinburgh, 1820-45, President RCP Edin. 1840-2.[47]
Richard James Mackenzie (1821-54), (Edinburgh, signed Obligation of Membership on January 11 1839, Third Junior President, 1840-41), MD Edin. 1841, LRCS Edin. 1841, FRCS Edin. 1844. He went to the Crimean War as a volunteer surgeon, and died there of Asiatic Cholera in 1854.

Abbreviations used in the text:
BA, Bachelor of Arts
MA, Master of Arts
BM, Bachelor of Medicine
MB MS, Bachelor of Medicine and Master of Surgery
MB, Bachelor of Medicine
Edin., Edinburgh
LRCS, Licentiate of the Royal College of Surgeons
FRCS, Fellow of the Royal College of Surgeons
MRCS, Member of the Royal College of Surgeons
RCS, Royal College of Surgeons
MRCP, Member of the Royal College of Physicians
FRCP, Fellow of the Royal College of Physicians
RCP, Royal College of Physicians
FRS, Fellow of the Royal Society
KH, Knight of the Guelphic Order of Hanover
DCL, Doctor of Civil Law
LL.D, Doctor of Laws

Endnotes
[1] This Diploma is engraved on parchment-paper, and measures 21.25 inches in width x 28.75 inches in length.
[2] Somewhat surprisingly, the Latin text indicated here, as transcribed from this Diploma, while correctly spelled on the Diploma is incorrectly spelled, and inappropriately punctuated, in the 1823 *Laws of the Society*. See:Anon (1823). *Laws of the Medical Society of Edinburgh*. Edinburgh: printed for the Society, by Hay, Gall, & Co. [includes *General List of the Members of the Medical Society of Edinburgh (1823)*], 72.
[3] This date was a Friday, but there is no mention in the Society's *Minute Book* that relates to this event. The possibility exists that this might be the date that he was elected an Extraordinary Member. It must be assumed that he was awarded this Diploma on another occasion, as an ordinary meeting of the Society was held on that evening.
[4] Gray, J. (1952). *History of the Royal Medical Society 1737-1937*. Edinburgh: University Press, 104.
[5] He was also required to present two clinical case reports. One of these was on "*Rupture of the bladder*," while the other was on "*Some points of the treatment of stricture of the urethra*."
[6] See: Gray J (*op. cit.* ref. 3), 104-8.
[7] Gray J (*op. cit.* ref. 3), 320.
[8] According to the *Minutes* of the meeting held on the evening of Friday 29 November 1839, "*...as the votes for Mr. Bell and Dr. Mackenzie were equal, which affected their rank in point of seniority, the Committee suggested that according to Law, a second Ballot for these two Gentlemen should immediately take place, when Mr. Bell, by a majority of votes, was declared first President.*" His first act as Senior President was to chair the Society's Public Business that evening, when Dr. Marr read his paper.
[9] According to the 1823 *Laws of the Society*, Chapter XXI, sections 6 and 7, "*6. Every member, Ordinary or Extraordinary, when granted a Certificate or Diploma, shall pay to the President in the Chair the Sum of FIVE SHILLINGS. 7. Every Member, when granted a President's Diploma, shall pay to the President in the Chair the Sum of TEN SHILLINGS.*" See: Anon (*op. cit.* ref. 2), 71-72. The Presidents elected for the 1839-40 Session of the Society were as follows: George Joseph Bell (Senior President), Donald Mackenzie (First Junior President), William Henry Low (Second Junior President), George Atkin (Third Junior President).
[10] George Joseph Bell *senior* was born on 26 March 1770 and died aged 73 on 23 September 1843. He passed at the Bar in 1791, was elected Professor of the Law of Scotland in the University of Edinburgh in 1822, and was appointed Principal Clerk of Session in 1832. He married Barbara, *eldest* daughter of Charles Shaw Esq. of Ayr, by whom he had ten children. She was born on 9 December 1786, married him on 22 October 1806 and died on 27 March 1827. His children were: Cecilia (born 8 September 1807), Barbara (born June 1814), Charles William (born 12 December 1810), *George Joseph* (born 19 August 1812), Marion Jane (born June 1814), Margaret Morice (born 27 September 1816), Caroline (born 1 November 1818), John Robert (born 1820), Francis Jeffrey (born 10 April 1823) and John David (born 27 June 1825). See: Anon (1963-64). Bell, George Joseph (1770-1843). *Dictionary of National Biography*, 2 Oxford: Oxford University Press, 158-9. For further details of the Bell and Shaw families, see: Kaufman, M.H. (2005). Brief observations of the genealogy of John and Charles Bell: and their close relationship with the children of John Shaw of Ayr. *Journal of Medical Biography* (in press).
[11] Bell, C. (1870). *Letters of Sir Charles Bell, K.H., F.R.S.L. & E. Selected from his Correspondence with his Brother, George Joseph Bell*. London: John Murray.
[12] He was in fact the *fourth child* and *second son* of Professor George Joseph Bell.
[13] The information about his Oxford University qualifications, and his College association, was obtained from Mrs Alice Millea, Assistant Keeper of Archives, Oxford University Archives, Bodleian Library, Broad Street, Oxford OX1 3BG. For information from: *Alumni Oxonienses 1715-1886*, see: Foster, J. (undated, but believed to be 1887). *Alumni Oxonienses: the*

Members of the University of Oxford, 1715-1886: their parentage, birthplace and year of birth, with a record of their degrees. Being the Matriculation Register of the University, alphabetically arranged, revised and annotated. In 4 Volumes. Oxford & London: Parker & Co, Volume 1, 90. Curiously, and possibly because of the influence of his father, he also attended Lincoln's Inn, London, during 1835.

[14] Anon (1851). *Royal College of Surgeons of Edinburgh. Act of Parliament (13th Victoria, Chap. XXIII.) for enabling Her Majesty to Grant a New Charter to the College; Also, Royal Warrant for a New Charter, Dated 11 March 1851; Together with Chronological Lists of Members and Fellows, of Presidents and of Honorary Fellows, from the earliest record (August 1581) to the date of the Charter.* Edinburgh: Printed for the Royal College of Surgeons, by Robert Hardie & Co. [Supplement: List of Licentiates, from 1 January 1815 to 1 January 1859].

[15] Anon (1867). *List of the Graduates in Medicine in the University of Edinburgh, from MDCCV to MDCCCLXVI.* Edinburgh: Neill & Co. This volume provides the year of graduation and titles of all Edinburgh M.D. theses published between 1726 and 1866, as well as the year of graduation and titles of all Edinburgh MB MS theses published between 1862 and 1866, and all Edinburgh MB theses published in 1865 and 1866.

[16] In the 1845 edition of the Laws of the Society, the date that he signed the Society's Obligation was given as 27 January 1837, and it also indicates that he came from Edinburgh. See:Anon (1845). *Laws of the Medical Society of Edinburgh.* Edinburgh: printed for the Society, by James Gall & Son, 60.

[17] In this regard until this Law was withdrawn in 1832.

[18] See: Anon (*op. cit.* ref. 2), for the relevant sections, see: Chapter XVI "*Of the Transcriber,*" 46-47; Chapter XVIII "*Of the delivery of Dissertations,*" 51-53; Chapter XIX "*Of the circulation of Minutes and Dissertations,*" 54-56. The Transcriber "*shall receive one shilling for every folio page of the Records of the Society which he may copy, including a Copy of the Paper for Circulation.*" As Bell's Dissertation was written and bound into the volume retained in the Library after 1832 (see relevant section of the text), the Dissertation was written in his own hand.

[19] Anon (1963-64). Wood, Alexander (1816-1884).*Dictionary of National Biography*, **21**. Oxford: Oxford University Press, 818-9.

[20] Anon (1963-64). Falconer, Randle Wilbraham (1817-1881). *Dictionary of National Biography,* **6**. Oxford: Oxford University Press, 1026.

[21] According to the Minutes of the Royal College of Surgeons of Edinburgh, Mr. Tytler was admitted an Ordinary Fellow of the College on 2 August 1841. The topic of his probationary essay was "*Injuries of the spine,*" the same topic as his MD dissertation. At a Meeting of the College held on 24 September 1841, the President of the College noted "*the untimely death of their youngest Fellow Member Dr. Thomas Bazett Tytler – an event which as they were all aware had occurred since last meeting under circumstances of a peculiarly distressing nature.*" No further details were provided, and no information has so far been located regarding the circumstances of his death. No notice of his death was published in the *Scotsman* newspaper between 4 August and 17 November 1841.

[22] His Will was registered in the Edinburgh Sheriff's Court on 17 February 1844, some months after his death. Its Reference Number is SC70/1/65, pages 59-61.

[23] Information from Dr. Jones, Archivist, Balliol College, Oxford. Neither his name, nor a death notice appears in the *London and Provincial Medical Directories* for 1847, 1848 or 1849, nor is there an obituary notice in any issues of the *Edinburgh Medical Journal* published during this period.

[24] Gordon-Taylor, G. and Walls, E.W. (1958). *Sir Charles Bell: His Life and Times.* Edinburgh & London: E. & S. Livingstone; Anon (1963-64). Bell, Sir Charles (1774-1842). *Dictionary of National Biography*, **2**, Oxford: Oxford University Press, 154-7. Sir Charles Bell was born on 8 November 1774. He became a distinguished anatomist, surgeon, physiologist and artist. He was knighted with the KH (in the Guelphic Order of Hanover) in 1830 to celebrate the accession of William IV. In 1836 he was appointed Professor of Surgery in the University of Edinburgh. He died on 28 April 1842 at Hallow Park in Worcestershire. He married Marion, *second* daughter of Charles Shaw Esq. of Ayr, "*and their marriage was one of perfect happiness.*" She was born in 1788 and married him on 3 June 1811, but there were no children of the marriage. She died on 9 November 1876.

[25] Christison was Dean of the Faculty of Medicine. From 1868-73, he was President of the Royal Society of Edinburgh. For additional information, see: Anon (1882). Obituary: Sir Robert Christison, Bart., M.D., LL.D., D.C.L. *The Edinburgh Medical Journal*, **27**, 852-63; Anon (1963-64). Christison, Sir Robert, M.D. (1797-1882). *Dictionary of National Biography* **4**, Oxford: Oxford University Press, 290-1.

[26] See: Anon (2004). Abercrombie, John (1780-1844), physician. *Dictionary of National Biography* **1**. Oxford: Oxford University Press, 77-8 [Author: Hervey, N]; see also: Gray J (*op. cit.* ref. 2), footnote on page 166.

[27] Anon (2004). Balfour, John Hutton (1808-1884), botanist. *Dictionary of National Biography* **3**. Oxford: Oxford University Press, 539 [Author: Omond, G.W.T., revised by Matthew, H.C.G.].

[28] See: Venn, J.A. (1944). *Alumni Cantabrigienses: A biographical list of all known students, graduates and holders of office at the University of Cambridge from the earliest times to 1900.* Part II (from 1752 to 1900). In 6 Volumes. Cambridge: Cambridge University Press, Volume **II**, 259.

[29] Tanner has suggested that some individuals did not take the full medical degree on account of the expense, but qualified therefor. Most of the Cambridge Degrees and Licences at that time were earned by study, residence, and examination. Day's Licentiate in Medicine must have been awarded in one of these categories. It is unclear whether the medical course he pursued in Edinburgh allowed him to receive this *Licence to Practice* without taking the Cambridge medical examinations. See: Tanner, J.R. (1917). *The Historical Register of the University of Cambridge: being a supplement to the Calendar with a record of University Offices, honours and distinctions to the year 1910.* Cambridge: Cambridge University Press, 344-5.

[30] Anon (2004). Day, George Edward (1815-72), physician. *Dictionary of National Biography* **15**. Oxford: Oxford University Press, 582-3 [Author: Anon., revised by Bevan, M].

[31] Anon (2004). Giraud, Herbert John (1817-1888) surgeon and botanist. *Dictionary of National Biography* **22**. Oxford: Oxford University Press, 343 [Author: Bettany, G.T., revised by Reznick, J.S.].

[32] For further details, see: Kaufman, M.H. (2004). Peter David Handyside's diploma as Senior President of the Royal Medical Society. *Res Medica* **268** (I), 23-6.

[33] Anon (2004). Jameson, Robert (1774-1854), geologist and natural historian. *Dictionary of National Biography* **29**. Oxford: Oxford University Press, 763-4 [Author: Dean, D.R.].

[34] Apart from his father, Dr. David Maclagan, he is the only individual to date to have been elected President of both the RCS Edin. and the RCP Edin. He was elected to these two offices in 1859-60 and in 1884-7, respectively.

[35] Anon (2004). Reid, David Boswell (1805-1863), physician and inventor of ventilation systems. *Dictionary of National Biography* **46**. Oxford: Oxford University Press, 382 [Author: Millar, A.H., revised by Harrington, R.]. He supervised the installation of the ventilation systems in a number of public buildings, including the new Houses of Parliament, in Westminster. For additional information, see: Reid, H. (1863). Memoir of the late David Boswell Reid M.D., F.R.S.E., etc. Edinburgh: R. Grant & Son; London: Simpkin, Marshall, & Co. (35 pp.).

[36] Anon (2004). Reid, John (1809-49), anatomist and pathologist. *Dictionary of National Biography* **46**. Oxford: Oxford University Press, 399 [Author: Pennington, C.].

[37] Anon (2004). Simpson, Sir James Young, first baronet (1811-1870), physician and obstetrician. *Dictionary of National Biography* **50**. Oxford: Oxford University Press, 695-7 [Author; Nicolson, M.]; for a biography of both Simpson and Syme, see: Shepherd, J.A. (1969). *Simpson and Syme of Edinburgh.* Edinburgh & London: E. & S. Livingstone Ltd.

[38] Anon (2004). Syme, James (1799-1870), surgeon. *Dictionary of National Biography* **53**. Oxford: Oxford University Press, 576 [Author: Nicolson, M.].

[39] Anon (2004). Thomson, Allen (1809-1884), anatomist and embryologist. *Dictionary of National Biography* **54**. Oxford: Oxford University Press, 486-8 [Author: Beaton, J.].

[40] Anon (2004). Traill, Thomas Stewart (1781-1862), physician and specialist in medical jurisprudence. *Dictionary of National Biography* **55**. Oxford: University Press, 217-8 [Author: White, B.M.].

[41] For further details on the activities and locations of the various Extra-mural Medical Schools in Edinburgh at that time, see: Kaufman, M.H. (2003). *Medical education in Edinburgh during the 18th and 19th centuries.* Edinburgh: Royal College of Surgeons of Edinburgh.

[42] This Diploma is engraved on parchment, and measures 23 inches in width x 32.375 inches in length.

[43] Anon (2004). Goodsir, John (1814-1867), anatomist. *Dictionary of National Biography* **22**. Oxford: Oxford University Press, 809-11 [Author: Baston, K.G.]. For the definitive biography and notice of his research and publications, see: Turner, W. (Editor) (1868). *The Anatomical Memoirs of John Goodsir F.R.S. with a Biographical Memoir by Henry Lonsdale, M.D.* 2 Volumes. Edinburgh: Adam & Charles Black [Biography, Volume 1, 1-203]. It is also of interest to note that one of the obituary notices for John Goodsir was written by John Hutton Balfour. See: Balfour, J.H. (1867). *Obituary Notice of Professor John Goodsir*. Edinburgh: Neill & Co. (11 pp., from the *Transactions of the Botanical Society of Edinburgh*, Volume 9, 1866-67).

[44] Anon (2004). Lonsdale, Henry (1816-1876), physician and biographer. *Dictionary of National Biography* **34**. Oxford: Oxford University Press, 417 [Author: Goodwin, G., revised by Wallis, P.]. In addition to writing the biography section of Turner's volume on Goodsir, published shortly after Goodsir's death (see: Turner, *ibid.*), he also wrote, amongst other biographies, the definitive biography of Dr. Robert Knox. See: Lonsdale, H. (1870). *A Sketch of the Life and Writings of Robert Knox the Anatomist. By His Pupil and Colleague*. London: Macmillan & Co.

[45] Anon (2004). Alison, William Pulteney (1790-1859), physician and social reformer. *Dictionary of National Biography* **1**. Oxford: Oxford University Press, 744-7 [Author: Jacyna, L.S.].

[46] Anon (2004). Ballingall, Sir George (1780-1855), military surgeon and medical writer. *Dictionary of National Biography* **3**. Oxford: Oxford University Press, 596-7 [Author: Peers, D.M.]. For definitive information on his immediate family history and his date of birth, see: Scott, H. (1926). 'Robert Ballingall.' In: *Fasti Ecclesiae Scoticanae: The Succession of Ministers in the Church of Scotland from the Reformation. No. 6. Synods of Aberdeen and Moray*. Edinburgh: Oliver & Boyd, 252. He was born on 2 May 1786, not in 1780 as indicated in the *Dictionary of National Biography*; see also: Kaufman, M.H. (2003). *The Regius Chair of Military Surgery in the University of Edinburgh – 1806-55*. Amsterdam: Rodopi B.V.

[47] Anon (2004). Graham, Robert (1786-1845), physician and botanist. *Dictionary of National Biography* **23**. Oxford: Oxford University Press, 233 [Author: McConnell, A.].


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The Scottish Contribution to the Development of Obstetrics

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Among the many things in which the Scots nation can take pride our contribution to medical science has been of a very high order. This perhaps reached its acme in the 18th and 19th centuries when Scotland in general and Edinburgh in particular represented the magnet for medical trainees from across the globe. The catalogue of Scottish contributions to developments in medicine is enormous but perhaps in no branch of medicine is it greater than in obstetrics. It could be reasonably claimed that in compiling a list of those obstetricians from the British Isles who have made the most telling contributions to the advancement of this clinical discipline the first half dozen names would probably be Scots. This short article will highlight some of the famous obstetricians who have helped to bring the art and science of obstetrics out of the mists of obscurity to the highly developed clinical science of today.

Some of the figures referred to here are household names and achieved lasting fame. Others made telling observations which perhaps did not gain the recognition they deserved. Perhaps the most significant of these was Alexander Gordon of Aberdeen. He was born in 1752 and died tragically young in 1799 but four years before his death he published a monumental treatise on the epidemic nature of puerperal fever, also known as childbed fever. This disease in which the causative organism was much later identified as the beta-haemolytic streptococcus was the scourge of childbirth carrying a frightful burden of maternal mortality in the 18th and 19th centuries and it was well into the 20th Century before the frightful spectre of this killing disease receded. The name most widely acknowledged as having identified the source of the problem was Ignaz Semmelweis a Hungarian who pursued his clinical career in Austria. He made observations concerning the transmission of puerperal sepsis by examining medical staff in 1847 more than 50 years after Gordon had made similar observations. Like Gordon his observations received little attention from colleagues and indeed were the subject of ridicule to the point that Semmelweis' career, and indeed his health, was permanently ruined. It is the latter's name which survives in connection with this disease. Gordon's observation however should not be underestimated and the failure of it to impact on clinical practice is a reflection of both the profession at large and the limited means of medical education and communication in his time.

Figure 1. (left): Smellie's wooden forceps (the "English lock" has become a standard part of obstetric forceps.)
Figure 2. (right): An illustration of a twin pregnancy in utero from Smellie's anatomical atlas (1756).

Figure 3. The scene in No 52 Queen Street when Simpson and his colleagues discovered the anaesthetic properties of chloroform (1847).

If Alexander Gordon is the unsung hero of Scottish obstetrics, a man born 100 years before Gordon published his treatise was perhaps the most influential and recognised for his monumental contributions to the understanding of the childbirth process. Dr William Smellie was born in Lanark in 1697. After a medical apprenticeship and a spell as a country physician in Lanarkshire he travelled to London and subsequently to Paris to study midwifery and became the great man midwife of his generation. His most fundamental contribution was his "Treatise on the Theory and Practice of Midwifery" in which he used his enormous experience, particularly among the poor people of London, to describe for the first time the complicated processes which accompany the journey of the fetus through the birth canal. It may be hard to appreciate nowadays just how important these observations were coming at a time when the level of ignorance was spectacular. But only by understanding the complicated contortions required of the fetus as it twists and turns through the limited space available in the birth canal is it possible to give appropriate care to women in labour. Smellie used this knowledge not only to instruct other practioners but also to provide the basis for instrumental deliveries, especially with forceps (*Figure 1*). He is remembered for the invention of what came to be known as the "English Lock" for the forceps and one of the treasures in the possession of the Department of Obstetrics and Gynaecology in Edinburgh is a pair of wooden forceps which Smellie employed to conduct deliveries under the bed clothes without the knowledge of the patient whom he feared would be alarmed by the noise of metal instruments. Smellie's other enormous contribution to the medical literature was his set of Anatomical Tables published two years after his treatise which contained 26 spectacular drawings by the Dutch artist van Rymsdyck (*Figure 2*) but also 13 illustrations which were probably prepared by Smellie himself. It is clear that Smellie was not only an outstanding practioner (gaining a reputation which led to his accolade as "the Master of British Midwifery") but also a not inconsiderable artist as seen from his portrait which hangs in the Royal College of Surgeons of Edinburgh and which is believed to be a self-portrait.

Born only a few miles from Smellie's birthplace some 21 years later was William Hunter, the eldest child of a large family in East Kilbride (his youngest brother being John Hunter who is regarded as the founder of the Royal College of Surgeons of England). William studied humanity and Greek, logic and natural philosophy at Glasgow University from the age of 14 but four years later was apprenticed to the famous William Cullen

Figure 1. The three rachitic dwarfs (1888).

who advised that he should study at Edinburgh University where he attended anatomy lectures before two years later travelling to London to work with William Smellie. In contrast to Smellie's practice amongst the poor of London Hunter became the Surgeon Accoucheur at the Middlesex Hospital and cultivated a practice among the rich and famous. The most notable of these was Queen Charlotte whom Hunter attended in several of her many pregnancies. He also published a famous work which gave wonderful insights into the circumstances of human pregnancy. His atlas of the human gravid uterus published in 1774 was also prepared with the help of Jan van Rymsdyk. The original chalk drawings prepared from Hunter's dissections of women who died in various stages of pregnancy are now in the possession of the Hunterian Gallery at the University of Glasgow and they are works of the most surpassing beauty.

In the early years of 19th century a child was born to another large Scottish family, this time that of the baker in Bathgate. James Simpson was the seventh son born to that family and from an early age was identified as a child of exceptional intelligence and potential. He had obtained his medical degree at the University of Edinburgh at the age of 19 but was to young to be allowed to practice so he spent the interim in profitable study. He was elected to the Chair of Midwifery and Diseases of Women in Edinburgh University at the age of 28 and had a glittering clinical career. Although he made significant contributions to the development of obstetric forceps and was perhaps the first to explore the possibility of developing a vacuum extractor for obstetric delivery he is best remembered for his discovery of the anaesthetic and analgesic effects of chloroform (*Figure 3*). This culminated a search for agents to relieve the suffering of women in labour, an activity which brought down on him the condemnation of the establishment. Not only did his medical colleagues fail to recognise the importance of his work but he was condemned by the clergy who accused him of "seeking to rob God of the cries of anguish and the pleas for forgiveness which sinful women require to express during childbirth". Simpson was undoubtedly the most notable medical figure of his generation and his funeral in Edinburgh in 1970 was the largest the capital of Scotland has ever seen. His portraits and busts are to be found in the Edinburgh colleges and his statue is to be found in Princess Street Gardens but he is perhaps best commemorated in the Simpson Centre for Reproductive Health in the Royal Infirmary of Edinburgh.

Simpson's work on anaesthesia and analgesia together with Lister's discovery of the principles of antiseptic surgery allowed obstetricians for the first time to countenance the possibility of Caesarean delivery. This operation had been attempted since the mists of antiquity but invariably carried a very high mortality rate. Murdoch Cameron in 1888 was working in slum ridden Glasgow where poor living conditions coupled with the absence of sunlight caused by domestic and industrial atmospheric pollution had led to an epidemic of skeletal rickets. He employed classical caesarean section as an elective procedure in the delivery of a series of rachitic dwarfs who would otherwise have inevitably died from obstructed labour (*Figure 4*). This was recognised around the world as the first organised application of this obstetric operation. Cameron was Regius Professor of Midwifery in University of Glasgow and was followed in that position by John Martin Munro Kerr who, recognising the morbidity associated with the classical procedure, introduced the lower segment operation which we use to this day and which in many parts of the world became known as Kerr's operation.

In this short history of the Scottish contribution to obstetrics two giants of the 20th century remain to be described. They were men who were in many ways rivals and had very different philosophies but each in his own way contributed enormously to the advancement of obstetrics. Sir Dugald Baird who had been first assistant to Professor Munro Kerr in Glasgow was Regius Professor of Midwifery in University of Aberdeen. He focussed his attention on the influence of social conditions on obstetric outcome. Building on the work which Kerr had pioneered studying influences on maternal mortality he expanded that audit process to embrace perinatal mortality. He recognised the importance of family planning and indeed was a leading figure in the movement to legalise abortion. Although this was a controversial campaign it rid the country of the scourge of criminal abortion which was associated with such an appalling death toll. Shortly after his retirement in 1965 Baird published a famous monograph entitled "The Fifth Freedom" which championed the need for women to be freed from the tyranny of excessive fertility. There are many parallels between the opposition which Simpson met in his quest for relief of pain in childbirth and the ordure which was heaped on Baird in his quest that women should only bear children which they wanted and were able to care for appropriately. The passage of time has shown that society has recognised the importance of both these developments.

Ian Donald was a contemporary of Dugald Baird. Born in 1910, the son of Paisley doctor, he had his early education in Edinburgh and then in South Africa where he graduated in Arts in Cape Town before studying medicine at St Thomas's Medical School in London. He was appointed Regius Professor of Midwifery in the University of Glasgow in 1954 and spent his clinical career seeking innovations in both obstetrics and gynaecology. His monumental contribution was his development of ultrasound as diagnostic science (*Figure 5*). He had seen sonar (sound, navigation and ranging) used during his wartime service in the Air Squadron of Coastal Command whose task was to seek out and destroy German U-boats and he had subsequently used the same modality as an echo sounder whilst sailing his yacht. One day in 1955 he and some of his colleagues set out to drive to Renfrew to the firm of Babcock and Wilcox, an industrial firm which used ultrasound to detect flaws in welding. Donald took with him in the boot of his car a variety of ovarian cists and tumours including uterine fibroids. One of the apprentices in the firm was sent out to buy a pound of fillet steak which was also used in the early experiments and from that simple initiative grew the entire science of medical ultrasound which was first used to clinical usefulness in gynaecology and obstetrics.

It is no exaggeration to say that ultrasound has utterly transformed clinical practice in obstetrics allowing a vision of the fetus in utero which hitherto had only been possible from the sort of post mortem dissections made 200 years earlier by William Hunter.

This short account of the Scottish contribution to obstetrics is unashamedly celebratory of the enormous impact our small nation has had in this speciality. It is perhaps no accident that Scots and Scots graduates have such a hugely disproportionate representation among the maternity hospitals and gynaecological units throughout the British Isles and far beyond. It is a tradition in which our nation and medical school can take great pride.

Figure 5. Professor Ian Donald performing scanning in early pregnancy with an ultrasound machine of his invention.

The National Health Service - The Appointed Day; Before and After

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I wonder whether being in my eighties is an excuse or a recommendation for offering an article to Res Medica; however, it is said that the recall of memory is easier for earlier than for later years. My comments may be colloquial and informal rather than statistical and academic and of necessity they will be of a biographical flavour. My experience of Medicine, pre and post NHS, falls between four dates; Qualification 1944, Consultant Appointment 1963, Retirement 1984 and today 2005. The Appointed Day for the inauguration of the National Health Service in England, Scotland, Wales and Northern Ireland was the 5th July, 1948.

The medical picture in the years 1939 to 1948 was of hospitals of all sizes in the big cities, for example in Edinburgh, where there were both voluntary and municipal hospitals. The voluntary hospitals were lead by the Royal Infirmary as the university and teaching hospital, and then the Deaconess and the Chalmers Hospitals linked with the Church of Scotland, the Sick Children's and the Princess Margaret Rose. Leith had its own Hospital.The non-voluntary hospitals had evolved from the Poor Law system and as Municipal Hospitals were funded by Town Council of Edinburgh. These were named by the points of the compass. The Northern housed medicine in particular rheumatology, the Southern housed medicine and geriatrics, the Eastern housed surgery in particular thoracic surgery and the Western was a major hospital with all departments including cardiology, gastroenterology and urology.

In these hospitals the pattern of medical staffing was Senior Staff, consisting of Consultants, Chiefs and Sub-Chiefs, then Clinical Tutors, then Residents. The consultants were unpaid and a typical day was spent as 8am to 10am operating in a private nursing home, 10am to 2pm operating, doing ward rounds and teaching in hospital, 2pm to 7pm doing domiciliary visits, consulting in private consulting rooms, covering special interests in clinics or in research.

Some days might be spent in hospital operating all day. There were ward rounds every day, including Saturday and Sunday. In some units Sunday was the Grand Round, with the Chief, the Sub Chief, the Ward Sister, the Houseman, the Junior, who was a student, and proverbially the ward cat.

The provincial hospitals outside the teaching centres were staffed by "Honoraries", GP Surgeons and GP Physicians, with considerable experience and higher qualifications, but part time and in General Practice. There would be a Resident Surgical Officer and a Resident Medical Officer, supported by junior staff.

The family doctors were in single or group practices, which were bought and sold, usually with the practice premises. Many patients were members of contributory schemes, from sixpence a week upwards, through mutual organisations or subscribed by their employers (the value of money was different and using the retail price index for 1944 as a measure of inflation, the equivalent today would be 60p). The collectors usually came house to house fortnightly. The monies were collated by firms of accountants and paid to the practitioners who had contracted to supply the service. To be on one of these lists was to be "on the panel". The doctor would greet each patient "Panel or Private?" A small charge such as half a crown was made (equivalent £3.03), but this might rise to seven and sixpence (equivalent £9.08) and rather more for a home visit. The great Rutherford Morison gave this advice to his younger brother, setting up in practice, "The patient will be more grateful and will better heed your advice if he is charged a fee, however small". These family doctors, the general practitioners, were responsible for their own patients throughout 24/7 hours of the week and would arrange cover by mutual arrangements. Locum services had yet to come. The municipal hospitals would charge patients their keep, perhaps three pounds a week (equivalent to £78.66). The voluntary hospitals would suggest a charge, but would accept a donation .The Free Hospital in London, later the Royal Free was an exception, as it did not charge at all.

From the generality of the medical profession, let us turn to the house surgeon, and I was one of the three at the Western General; I was HS for six months, 1944/45. The hospital was familiar as I had been a resident student during the summer vacation and had been at school across the road. A typical day started at 9am and continued with meal breaks until 9.30 or 10pm. The work was ward work, assisting in clinics, assisting in theatre and being available for casualty and any emergency. There was the Wednesday fracture clinic for applying and taking off POP (plaster of Paris) casts, and a Tuesday morning of rag and bottle anaesthesia for the tonsillectomy list. The evening was spent in the basement doing the urines, the blood counts and the blood ureas of patients in the 24 bedded ward. Na and K estimations were less frequent and required opening the main laboratory and using the flame photometer, leaving it all spotless for the biochemist in the morning. After this, came the writing up of case notes, often a back log, and so to bed. We worked one in three, except for the six weeks when one was on leave. Saturdays and Sundays were morning only; usually the Sunday Grand Round finished by 2pm or 2.30pm.

Our salary for the six months was £73,14s,0p, under three pounds a week (equivalent to £1932.40 as pay, but we had our keep; meals, lodging and laundry provided, so we might double this to make it £3865, which would bring the salary to £7,370 per annum). I received 15 guineas for assisting in private and four guineas for medical reports (Guinea equivalent to £27.50). It was great fun and we got to the odd picture house or rugger match and there were good mess parties. My dues to the Royal Medical Society were one shilling and three pence for the Society's key, two guineas twice for annual membership and four guineas for life membership. There had been little change in the actual figure since 1796 when the fee for the first two years was five guineas. In 1944 the annual subscription to the Drumsheugh Baths was only three guineas.

The general picture before the appointed day was of service, with the privilege of service and in return security and an established place in society. Most of us stayed on the tramlines, leading to becoming consultants in hospitals or principals in general practice. The administration of a hospital was simple with a Chief Administrator and his staff and a very powerful Matron with an Assistant Matron. The municipal hospitals benefited enormously by having an administrator who was medically qualified, who was known as the Medical Superintendent, and he fully understood the problems and could communicate with the medical staff at all levels.

Then came the the Appointed Day, 5th July 1948. The National Health Service, like Caesar's Gaul, in *tres pars divisa est*; in as much as it was divided into (1) the hospitals (2) the family doctors, the dentists, the pharmacists and opticians and (3) the Local Authority Health Services. It was a massive structure to come into being. The hospitals came under some 14 to 16 Regional Hospital Boards and hospitals are the part of the health service upon which I feel able to comment. The transfer appeared to be smooth, although there were frequent Committees and Commissions required to adjust and adjudicate and to litigate and legislate. There was

a chronic shortage of money. The country was impoverished after the 39-45 War and was committed to a further drain in the Korean War; *parri passu* there were considerable and rapid clinical advances. Aneurin Bevan, the founder of the NHS had said that the Service would always be in deficit because of medical advances in treatment and care.

Pre-1948, medical and surgical practice was mostly involved in the exanthemata, pneumonia, sepsis, osteomyelitis, poliomyelitis and tuberculosis of lung and bone. Post-1948, antibiotics, anti-tuberculosis drugs and immunisations changed the picture; beds were saved but treatments were costly; fever hospitals and sanatoria were closed, but drug bills increased, both in hospital and in general practice. As an aside, I remember when simple herniorrhapies were kept flat in bed for three weeks, and they are now day cases. The first penicillin was given in 1945 as 100 units given by the Eudrip (Edinburgh University drip), which was a perforated intramuscular needle gravity fed from a 12oz flat medical bottle containing a greeny yellowy liquid too impure to dispense in mgm. Limbs and lives were lost from septic fingers and tetanus was not unknown. There was an appreciable infant mortality.

Now let us move on a score of years, having served overseas in the RNVR, I was trained as a general surgeon at the WGH including nine years as a senior registrar. 1963 saw me as a consultant surgeon in the small town of West Hartlepool with a population of 100,000. Here the same professional relationships applied. The administration was simple with the Secretary, the Matron and a chosen member of the Medical Staff running the hospital with a minimal supporting staff. There was further good support from the Regional Hospital Board with their teams of engineers, architects, statisticians and others. Money was short. In most Districts funding followed the past. The large institutions in the cities fared well but the one time poorhouses in small towns fared badly. There was still a voluntary element; the management committee and the medical staff committee met in the evenings and did not close until the business was completed. The theatre lists might be long and delayed by emergencies but operations were never cancelled. Not only was money short in the hospital service, it was also short outside the hospitals and charges for prescriptions, for dental services and later for optometric services were introduced.

Private patients were allowed as outpatient in the hospital, with no different medical care, but in a single room with a different coloured bed cover and a special tea set. They were a useful source of funding, because the money which came in was free money and could be used as the local management thought best. As a side benefit it kept the consultant at work in his own hospital. However, it became anathema to Barbara Castle and thus politically unacceptable.

Criticism has been raised about the remuneration of consultants by the merit award system; it always seemed to me that those involved bent over backwards to be fair and even minded. There was considerable professional freedom; patients could be referred by the family doctor or by the consultant to any specialist unit wheresoever. There was never any direction from an administrative or financial authority. Many patients were seen in their homes, either by the GP's on their rounds or by consultants on domiciliary visits. These consultations were good both for the patient, who might be disabled, and for the doctor, who would see the patient in his own surroundings.

In the two decades, 1945 to 1965, money was short and for doctors there were not many job opportunities; pay did not move with inflation. There was medical emigration and many Scottish doctors moved abroad, especially to Canada. Many of the teaching staff, lecturers and junior lecturers moved to the United States. Sadly many did not return and we are still suffering from this transatlantic brain drain. In the nineteen seventies for a few years the coffers were opened, pay was comparable to the other professions and many of the long-planned building schemes came to fruition. This was a slow process and some of the schemes were truncated and delayed; many were only completed in the eighties.

In the years 1950 to 1980 power was predominately in the hands of the professions of medicine and nursing, at first the doctors and then the nurses. This was healthy for the patient. It seems to me, on the sidelines, that power then passed to the administrators who are directed as puppets by the ideological fancies of the politicians. There is far too much paperwork, paperwork which has been increased rather than diminished by the coming of information technology. No piece of paper is less than foolscap and on these sheets it is so easy to print boxes to be ticked for every single activity. Before the health service and in its early years the doctors were supported in the care of their patients by superb nursing. However busy, nurses knew their patients and talked to them; today they appear to have moved from the head of the bed to the case notes and to the proformata at the foot of the bed and at the nurses' station. Their smartness and their uniforms in hospital have been lost and their drab working clothes are seen in supermarkets and on the streets.

Both before and for some years after the introduction of the NHS the hospitals were active and busy, they were scrupulously clean and all levels of staff pulled together and collaborated. The immediate effects of the change were good. In all three divisions of the health service there were improvements and these were made available to everybody. There were big tasks awaiting the new Health Service; the country was making good after the privations of total warfare and there were now available new and miraculous remedies. The changes in the Health Service have been very much greater during its life than at its birth. There has been a considerable increase in management, in executive and in administrative growth. I am of the opinion that management should be made smaller and decentralised and I take the view that financial resources should be directed to the training and provision of more nurses and more doctors.

Now is the time for reappraisal. We should assist this reappraisal by making comparison with what is provided in other countries in Europe and in the English speaking world. It is important for everybody that we get this on track before our own National Health Service attains its Golden Jubilee in 2008.

The Four Presidents: Gordon McNaught *(second from the left)* as Junior President

Early History of The Royal College of Physicians of Edinburgh

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Factors that led to the award of the College's Royal Charter. The definitive history of the College written in 1976 by Craig runs to over 1,100 pages, and that by Ritchie in 1899 is also substantial.[1] It is unlikely therefore that this account could be other than a very brief chronology of the principal events associated with the Royal College of Physicians of Edinburgh between the early 17th century and the present time. While the College eventually received its Royal Charter in 1681, this was only after three previous abortive attempts had been made in 1617, 1630 and again in 1656. These various attempts were each made by small groups of dedicated physicians, all of whom had received their medical training on the Continent. On returning to Edinburgh, they particularly wished to elevate the status of their city, and the standard of medical practice in Scotland, but particularly in Edinburgh and its surrounding area. They were certainly aware that the standard of medical practice was without question far lower than it was on the Continent and even in England at that time. The award of a Royal Charter would also undoubtedly elevate the status of the Physicians as a corporate entity from the others that practised medicine in the same area. The Physicians in Edinburgh also believed that they would be in a similar position to their clinical brethren in London who had received their Royal Charter in 1518. Considerable difficulties were encountered over the years, however, before the Edinburgh physicians successfully obtained their Royal Charter. These came from a number of quarters, but particularly from the Edinburgh Surgeons, from the Church, from factions within the Town Council and from the University.

In 1617, for example, the establishment of such a Charter undoubtedly had the blessing of King James VI, but the opposition at that time principally came from the Archbishops and Bishops. They were of the view that the establishment of such a College might restrict their privilege of awarding degrees, as at that time they were the Chancellors of Britain's three oldest Universities.[2] The Surgeons who, rightly or wrongly, believed that the establishment of a College of Physicians might restrict their rights and privileges, also expressed strong reservations. For these and other reasons, this, their first request for a Royal Charter, was unsuccessful. A second request, in 1630, was made to Charles I. Possibly because of the unsettled state of his Kingdom at that time, he referred the matter to his Privy Council. The physicians had supported their application with 17 Articles, all of which appeared to them to be particularly reasonable, although others did not necessarily agree with them. These included the following: that their senior officers, their President, Council and all of their Office Bearers, would be selected only from amongst their appropriately qualified membership. They also indicated that within their sphere of influence they would supervise the sale of drugs, so that only drugs that they thought were safe were in fact sold, and that only certain appropriately qualified individuals would be able to sell them. One of the Articles indicated that all that practised medicine as Surgeons, Apothecaries or Physicians should be appropriately examined, and that all appropriately qualified individuals would be licensed. If physicians passed certain examinations, they would also be awarded a doctorate. This was the first indication that they wished to have the power to award appropriately qualified individuals medical degrees. They also proposed that they should have the legal authority to deal with "unqualified" medical practitioners. For reasons that are now unclear, this application was also rejected.

Figure 1. Physician's Hall, George Street, Edinburgh. Drawn and engraved by J & HS Storer (1820). This building was designed in 1775 by James Craig, and demolished in 1844.

Figure 2. Another view of Physician's Hall, George Street, Edinburgh. Drawn by Thomas H. Shepherd and engraved by J. Henshall (1829).

The third unsuccessful application was made in 1656, in the time of Oliver Cromwell. On that occasion, a Commission was established to seek further advice on the matter. Recommendations were made to the Lords of Council. After additional advice had been sought, the various interested parties in Scotland were sent a copy of the proposed Charter for their consideration. The abreaction this received was considerable. This was principally from the City of Glasgow, as their own Faculty already possessed a Charter that was all-embracing and included Physicians, Surgeons and Apothecaries. The Glasgow Faculty was also concerned at the suggestion made in the Charter that the territory over which the Edinburgh Physicians proposed that they should have control was all of Scotland, rather than exclusively Edinburgh and the area immediately around it. Similarly, the Edinburgh surgeons were also particularly concerned. They believed that amongst other things, the effect of this exercise would almost certainly be to diminish the value put on their acknowledged expertise as well as restricting their activities. This was despite the fact that they already possessed a Royal Charter that dated from 1505.[3]

The surgeons also emphasised that Members of their Incorporation had carried out almost all of the teaching of the apprentices that had been undertaken in Edinburgh over the previous century and a half. They also objected to the fact that almost all of the physicians who were applying for a Charter had qualified in foreign universities. The Members of the Incorporation also noted that the role and status of the surgeons in these countries was invariably subservient to that of the physicians. The universities, but particularly Aberdeen that had for some centuries granted medical degrees, were also extremely agitated. It appeared to them that

the physicians wished to take over the granting of medical degrees, and that they (i.e. the proposed Edinburgh College of Physicians) rather than the universities would thenceforth take over this role.

This and other points were discussed at a meeting held in Dundee in July 1657. In 1672, the Incorporation of Surgeons indicated that they were unanimously supportive of elevating the Town's College of Edinburgh into a University. This was clearly to prevent the physicians from being given the powers to award medical degrees. They were also agitated about the possibility that the Physicians wished to award licentiate diplomas to others that they considered to be appropriately qualified practitioners, such as the Surgeons and Apothecaries.

Probably due to the dedicated influence of Dr Robert Sibbald (1641-1722), a fourth application, on this occasion to Charles II, was eventually rewarded.[4] The Edinburgh College of Physicians received its Royal Charter, and this was dated 29 November 1681, despite strenuous opposition, as previously principally from the Edinburgh Incorporation of Surgeons, from the Town Council as well as from other interested parties. The Charter was ratified by Parliament on 16 June 1685. The Physicians were particularly agitated that they should be given legal authority to inhibit the activities of persons whom they considered to be illiterate and/or unqualified practitioners or "Quacks." It was principally because there was no indication in their Charter of 1681 that they would in any way influence the practice of the surgeons, that the Incorporation eventually withdrew its reservations about the award of the Charter to the Physicians. It was understood that the Members of the Incorporation would retain the right to treat all conditions that had previously been treated by them, and any subsequent conditions that may have resulted from their activities. It should be noted that the apothecaries also indicated their support for the Physicians, particularly for their desire to control the activities of unqualified practitioners. The Glasgow Faculty's objections were also countered by the insertion of the clause into the Physician's Charter that they would restrict their activities to Edinburgh and its immediate environs rather than to Scotland as a whole, as had been suggested in their earlier application of 1656.

It appears that when Sibbald showed Charles II the Warrant signed by his grandfather James VI in 1621, he immediately recognised his handwriting, and was happy to offer the applicants his full support. Furthermore, Archibald Pitcairne, one of the Edinburgh petitioners, like some of the Members of the Council of the London College of Physicians, had all either been pupils or strong advocates of the teaching of William Harvey. Out of the original 21 Physicians who constituted the College at the time they received their Charter, 11 were graduates of the University of Leyden, while a further 6 were graduates of other Continental universities.[5] During 1682, the College received as a gift from Sibbald of a substantial number of his books, and these were to form the basis of the College's important Library.

As a result of the passing of the Universities' Act of 1858, a number of the items in the College's Charter of 1681 became obsolete, and it became necessary for them to obtain an updated Charter. This was obtained on 31 October 1861. A short supplementary Charter dated 8 January 1920 gave the College the authority to admit women on the same terms as men.

College accommodation

The College was particularly keen to possess its own Hall where all of their meetings could take place. However, before a suitable Hall was found, the Fellows used to meet at regular intervals in Sibbald's lodgings. In 1698, it was decided that a suitable house should be purchased, but for various reasons this plan was not pursued. In 1704, a Committee of 6 Fellows was established to consider other possibilities. A decision was made later that year to purchase a house and its associated grounds at the foot of Fountain Close, near to the Cowgate-port, that would be used as their official meeting place. Some years later, when these premises were found to be somewhat smaller than they had anticipated, they found that they had insufficient funds to move elsewhere. In 1722, funds were borrowed from a city merchant to allow the College to erect a new Hall on the Fountain Close site. Eventually, even this was also found to be inadequate for their needs, and the site was sold in 1770 for only £800, principally because of its very poor state of repair at that time. This site was sold to gentlemen of the episcopal communion in Edinburgh, and on it they later erected the English Chapel.[6]

Because some of the more valuable books in their Library were already showing considerable signs of deterioration, they approached the Managers of the Royal Infirmary (then located in Infirmary Street) to see whether they might be able to store their books, on a temporary basis, somewhere in the Infirmary. As the Managers were extremely sympathetic to the activities of the College, they provided them with a suitable apartment within the Infirmary in which they could store their books. In addition, the Fellows were allowed to meet at regular intervals in the Managers' Board Room. These arrangements persisted for the following 15 years, until the College eventually acquired a suitable site in George Street on which they could build their new Hall. An architect was therefore engaged to draw up the necessary plans. The College had originally been offered the site of the present Register House, at the eastern end of Princes Street. However, the Government decided that Mr Robert Adam's architectural plans for this site would be more suitable for their own needs, rather than for those of the College. The work on the George Street site commenced in 1775, and although parts were occupied during August 1781, the Hall was not completed until about 1830. While the entire building was not yet completed when certain engravings were prepared, its handsome exterior is clearly displayed in Storer's engraving published in 1820 (*Figure 1*) and in Shepherd's engraving published in 1829 (*Figure 2*).[7] The land on which the George Street Hall was built was feued from the Town Council, and Mr James Craig, the architect of much of Edinburgh's New Town, was engaged to design and supervise the building of the Hall. Dr Cullen laid its foundation stone in the presence of all of the Fellows on 27 November 1775.[8]

Because of the very considerable expense involved in the actual building of their Hall, the College went into increasing debt over the years, so that even before it was occupied proposals were made for its sale should a suitable purchaser be found. Indeed, the College was almost plunged into bankruptcy over the inordinate cost involved. Because of the latter, many of the internal fittings meant for the various apartments within the building and in the Hall simply failed to materialise. Because the College had no capital, it had no option but to sell its Hall when the first available reasonable offer was received. This was for £19,700, and had been received

Figure 3. Recent photograph of the main entrance to the Royal College of Physicians of Edinburgh in Queen Street, Edinburgh. (Published with Permission, RCAHMS, ED/2458).

Figure 1. Perspective view, dating from about 1865, of the interior of the College's Library. (Published with Permission of Royal Incorporation of Architects of Scotland).

from agents acting on behalf of the Commercial Bank of Scotland. It was desperately hoped that this sum would prove adequate for them to build a slightly less ostentatious Hall. This also meant that from 1843 to 1846 the College was without its own Hall. They were forced to rent premises that were then located at 119 George Street,[9] and it was in a house on this site that the College used as their meeting place during this period.

It was also during extensive reconstruction work undertaken on their previous Hall in George Street that its original foundation stone was discovered. As with other foundation stones laid at about that time,[10] this was found to contain a number of items within it that related to the date that the stone was incorporated into the building. Also found within the stone, were two silver medals. One of these bore the College's coat of arms on one side with the names of the President and the architect on the other side. The second medal had an image of the College's Hall, associated with the Aesculapian serpent and rod, on one side, while on the other side was the name of the architect, associated with the following inscription: "*Architecto Propter Optimam Edinburgi Novi Ichnographiam.*"

The foundation stone of the College's present Hall, in Queen Street, the main entrance to which is shown in *Figure 3*, was laid on 8 August 1844. As previously, the President of the College laid the foundation stone in the presence of numerous Fellows. In addition, Civic dignitaries and representatives of the University were also present. Once again, following tradition, contained within the foundation stone was a copy of the *Edinburgh Pharmacopoeia* associated with a full list of the College Fellows. The foundation stone also contained a copy of the *Edinburgh Almanac* for 1844, several coins bearing the date 1844 and an item of silver plate with an appropriate Latin inscription. The Hall's architect was Thomas Hamilton, who had also shortly before designed the Royal High School of Edinburgh. The ornate Meeting Hall of the College was completed in 1868, and over the years has been modified and refurbished on a number of occasions. In order to erect their new Hall in Queen Street, the houses then located on the site (Numbers 9 and 10 Queen Street) had first to be demolished. The total cost of the College's new Hall was close to £10,000.

Even by 1864, further accommodation was required, due principally to the increased number of Fellows and the addition of a substantial number of books to the Library (*Figure 4*). In order to achieve the necessary expansion, the property at Number 8 Queen Street was purchased for £6,000. This house was to the east of the College's Hall, at Number 9 Queen Street. Number 8 was designed by Robert Adam, and was believed to have been the first house erected in Queen Street. It dated from 1770, was built on three storeys, and suited the needs of the College at that time. This also allowed extensions to be made to both the main Hall and the Library. A further property, Number 11 Queen Street, to the west of the College's main Hall was purchased in 1970, and has also allowed the College to extend further, as well as improving the facilities for its Fellows.

Physic Gardens.

During the 17th century, both the Surgeons, but particularly the Apothecaries associated with them, and the Physicians in Edinburgh recognised the value of establishing Physic Gardens. In these gardens they were able to grow considerable numbers of different medicinal plants and herbs that would be of great value to them in their clinical practice. In 1670, for example, two physicians in Edinburgh were principally instrumental in establishing one of these Physic Gardens. These were Drs Robert Sibbald and Andrew Balfour (1630-94), and this was established in the small garden attached to Dr Balfour's house. In order to obtain the necessary plants, they sought advice from Mr John Brown "gardener of the North Yardes in the Abbey" (i.e. of Holyrood Abbey). They also became acquainted with James Sutherland and he, because of his industry and very considerable botanical knowledge, was appointed in overall charge of the garden. The Town Council later leased a second Physic Garden, within the grounds of Trinity Church and Hospital, to Mr Sutherland. Despite initial reservations from the Surgeon-Apothecaries, it was they who had assisted Drs Sibbald and Balfour in obtaining a long lease for Mr Sutherland from the Town Council. This garden was, from 1676, termed the (Edinburgh) Botanical Garden, and both Sibbald and Balfour were appointed its honorary "visitors."

The fact that the Surgeon-Apothecaries had approached the Town Council on behalf of Mr Sutherland is of some interest. The Surgeons had since about 1664, or possibly even earlier, their own Physic Garden in which their gardener, Mr George Cathcart, grew considerable numbers of medicinal plants. This garden was located in High School Yards, and Mr Cathcart, albeit unpaid, occupied a small house rent-free beneath the Surgeons' convening room at Curryhill House.[11] This was located in what became known as Surgeons' Square. Flowering plants were also grown in this garden, principally but not exclusively for the benefit of the Surgeons. Mr Cathcart also grew plants for his own use that he could sell to the public, and was additionally allowed to sell liquor and keep a bowling alley. These were all on condition that the rowdier elements of the population were denied access to the garden, the liquor and the bowling alley. Similarly, the Scholars at the High School were also denied access to the bowling alley.

James Sutherland's skills and very considerable botanical knowledge were soon recognised by the Town Council, and he was then appointed their Professor of Botany in 1676.[12] In 1683, he published his important *Hortus Medicus Edinburgensis*,[13] and received a salary of £20 Sterling *per annum* from the Town Council. In 1689, during the siege of the Castle, when it was considered necessary to drain the North Loch, the water ran over the Physic Garden at Trinity Hospital, completely ruining it. Sutherland then had no option but to concentrate his efforts in extending and improving the Garden at Holyrood. This became the second oldest Botanical Garden in Britain, that in Oxford having been founded in 1632. For his services, Sutherland was appointed King's Botanist for Scotland when he was in charge of the Royal Garden at Holyrood Palace.[14]

Towards the end of the 17th century, James Sutherland was authorised by the Surgeons to instruct their apprentices and servants in the elements of medicinal botany. His teaching course was given four times yearly, and for which he received a guinea from each of his pupils. Because of a difference of opinion with the Town Council,[15] he resigned his College Professorship, and Charles Preston succeeded him in 1705. He was requested by the Surgeons to continue teaching their apprentices and servants in a similar manner to that of his predecessor. When Charles Preston died in 1711, his brother George succeeded him in this office. During his period of office, the surgical apprentices attended his garden from the middle of May until the end of September, from 5-7 am each morning. During the early 18th century, there were four Physic Gardens in Edinburgh.[16]

Close association between the College of Physicians and the University during the late 17th and early 18th centuries.

While the Town's College of Edinburgh had been established in October 1583, in the late 17th century it required the appointment of three Fellows of the Royal College of Physicians of Edinburgh to Professorships in Medicine to elevate its status to that of a University. The Town Council appointed, but without salary, Sir Robert Sibbald, Drs James Halket and

Archibald Pitcairne (1652-1713) to these posts. The Town Council Minute records as follows:

That the University was:
"*indowed with the previleges of erecting professions of all sorts, particularly of Medicen,*" and that there is "*a necessity ther be ane professour of Physick in the said Colledge, therefor as Patrons of the said Colledge and University unanimously elect, nominate, and choyse the sd Sir Robert Sibbald to be Professor of Physick in ye sd University.*" On 4 September 1685, the Minute intimates as follows: "*that the Counsell appoynts two Professors of Medicen to be joyned with Sir Robert Sibbald in the University.*" On 9 September the Minute records "*Considering that ther is ane necessity ther be more Professors of Medicen in the said University, and understanding the abilityes and great qualifications of Doctor James Halkit and Doctor Archibald Pitcairne, Doctors of Medicen, and ther fitness to teatch the airt of Medicen in the said University, Doe therfore elect, nominate, and choyse ye sds two Doctors to be joyned with the said Sir Robert Sibbald, his Majestie's Phisitian in ordinary, to be Professors of Medicen in the sd University*," etc., etc.[17]

While always a controversialist, after one particular difference of opinion with the College of Physicians, Pitcairne decided to transfer his allegiance to the Surgeons. He became a Fellow of the Incorporation, without examination, on 16 October 1701. He always had a strong interest in the teaching of Anatomy, and played a critical role in their public dissections of 1702 and 1704, carried out in Surgeons' Hall. On both occasions he presented the epilogue or conclusion on the last day of each of these public demonstrations. This undoubtedly led to the appointment of Robert Elliot as their "public dissector," and he was, on 29 August 1705, appointed the first Professor of Anatomy in the University of Edinburgh.

Since neither Sibbald, Halket or Pitcairne were apparently ever instructed to teach students, it is unclear whether they delivered any lectures. While, theoretically at least these three Professors of Medicine formed the nucleus of a Faculty of Medicine, this did not formally materialise until 1726. This was when their successors formally gave lecture courses in their disciplines to complement those already given by Professor Alexander Monro *primus*, who had been appointed by the Town Council to the Chair of Anatomy on 22 January 1720. He had succeeded Professors Robert Elliot, Adam Drummond and John McGill as Professor of Anatomy in the University of Edinburgh and, as they had, he received a salary of £15 Sterling *per annum* from the Treasurers of the Town's College.

Professors Andrew St Clair (also spelled Sinclair) (d. 1728), John Rutherford (1695-1779), Andrew Plummer (d. 1756) and John Innes (d. 1733) were all appointed to University Chairs. The latter had been appointed by the College of Physicians to teach the Theory and Practice of Medicine, as well as Chemistry. They, with Monro *primus*, constituted the first Faculty of Medicine in Edinburgh and, from 12 October 1726, constituted an organized School of Medicine.[18] On 9 February 1726 they applied to the Town Council to be appointed Professors in the University on the same footing on which their colleague Monro had been appointed several years previously, but without salaries. Their petition was granted.[19]

In 1725, Lord Provost Drummond with the support of John and Alexander Monro, the Fellows of the Royal College of Physicians and a number of influential citizens, played a critical role in obtaining sufficient funds to allow the erection of a small teaching hospital in Edinburgh. It was formally opened on 6 July 1729. This was called the "Little House," and was to be a Hospital for the Sick Poor of Edinburgh. It later became the first "Royal" Infirmary when it received a Royal Charter from King George II on 25 August 1736.[20]

Endnotes and References.

[1] Craig, W.S. (1976). *History of the Royal College of Physicians of Edinburgh*. Oxford, London etc.: Blackwell Scientific Publications. See also: Ritchie, R.P. (1899). *The Early Days of the Royall Colledge of Phisicians, Edinburgh: the extended oration of the Harveian Society, Edinburgh, delivered at the 114th Festival by the President*. Edinburgh: George P. Johnston.

[2] In Scotland at that time, the Chancellors of St Andrews, Glasgow and Aberdeen Universities were also either Bishops or Archbishops.

[3] For a copy of this Seal of Cause, that is preserved in the Records of the Town Council of the City of Edinburgh, and a full transcription of its text, see: Comrie, J.D. (1932).*History of Scottish Medicine*. 2nd Edition. In 2 Volumes. London: Baillière, Tindall & Cox, Volume 1, 160-64.

[4] Sibbald had first studied theology in Edinburgh before proceeding to Leyden where he studied medicine. For further details of his medical career, see: Sibbald, R. (1833, but published after his death). *The Autobiography of Sir Robert Sibbald, Knt., M.D. To which is prefixed some account of his MSS*. Edinburgh: Thomas Stevenson; London: John Wilson, 15-17 [autobiography began on 23 September 1695, pp. 11-44]. This is an extremely interesting and valuable volume, and should be perused by those interested in the early history of what was to become the Royal College of Physicians of Edinburgh. It is probably also relevant to note that Sibbald received a knighthood at Holyrood Palace during the following year, in 1682, as did two other College Fellows, Drs Archibald Stevensone (1629-1710) and Andrew Balfour (1630-1694). All of those to be awarded a knighthood apparently went to Holyrood Palace on other business, and the award of a knighthood came as a complete surprise to them. See: Sibbald, *ibid*., 32.

[5] For a complete list of the original petitioners, see Craig, *op. cit.* ref. 1, 65-6.

[6] Arnot, H. (1779). *The History of Edinburgh*. Edinburgh: W. Creech; London: J. Murray, 322-23.

[7] Storer, J. & Storer, H.S. (1820). *Views in Edinburgh and its Vicinity; drawn and engraved by J. & H.S. Storer; Exhibiting remains of Antiquity, Public Buildings, and Picturesque Scenery*. In 2 Volumes. Edinburgh: A. Constable & Co.; London: J.M. Richardson, Chapell & Son, Nornaville & Fell, Smith & Elder, Cowie & Co., Taylor & Hessey, T. Wilson & Sherwood, Neely, & Jones [the section in Volume 1 with the engravings is unpaginated, as is all of Volume 2]. See also: Shepherd, T.H. (1829). *Modern Athens! Displayed in a Series of Views: or Edinburgh in the Nineteenth Century: Exhibiting the Whole of the New Buildings, Modern Improvements, Antiquities, and Picturesque scenery of the Scottish Metropolis and its Environs, from Original Drawings*. London: Jones & Company [the pages on which the engravings are displayed are unpaginated].

[8] A detailed description of the architectural features of both the interior and exterior of the College's Hall and Library were published by Arnot. See:Arnot, *op. cit.* ref. 6, 322-24.

[9] This is part of the site presently occupied by the offices of the Church of Scotland, and is located towards the western end and northern side of George Street.

[10] The foundation stone of the first Hall of the Royal Medical Society (RMS), at 11 Surgeons' Square, was found when this building was demolished, and was later incorporated into the stairwell of the Society's second Hall in Melbourne Place. This foundation stone was laid on Friday 21 April 1775 by the President of the Royal College of Physicians of Edinburgh, Professor William Cullen. He had suggested both the site and plan of the building. This foundation stone, when examined carefully, was found to contain a glass bottle and a hermetically-sealed leaden case. Inside the bottle was found the inscribed silver medal that is now worn by the Society's Senior President on official occasions. It is also relevant to note that Cullen was presented with a suitably inscribed handsome gold medal by the Society in 1775 in recognition of his services to them. This medal is now on display in the Extension to the National Museum of Scotland, in Chambers Street. The RMS obtained their Royal Charter in 1778. William Cullen had been elected President of the Royal College of Physicians of Edinburgh on 3 August 1773, and held this post until 30 November 1775. He was Professor of Medicine between 1773-90, when James Gregory succeeded him.

[11] Shortly after the Surgeons took possession of Curryhill House, they extensively altered this property, and a gardener's house was subsequently built in its grounds. While the main house soon proved unsatisfactory for their needs, the Incorporation were unable to afford to build a more suitable Hall on this site. By the early 1670s the house became increasingly dilapidated. In about 1694 it was re-roofed, and rented by the Presbyterians, who used it for some years as their meeting hall and place of worship. At this time, the Surgeons used another house nearby as their meeting hall. This had been built by the Town Council for the use of the Professor of Divinity. See: Creswell, C.H. (1926). *The Royal College of Surgeons of Edinburgh: Historical Notes from 1505 to 1905*. Edinburgh: Oliver & Boyd, 48-50.

[12] Although in 1695 he was apparently more formally elevated to the post of Professor of Botany in the Town's College. See: Comrie, *op. cit.* ref. 3, Volume 1, 264.

[13] Sutherland, J. (1683). *Hortus Medicus Edinburgensis: or a Catalogue of the Plants in the Physical Garden at Edinburgh; containing their most proper Latin and English names; with an English Alphabetical Index.* Edinburgh: printed by the heir of Andrew Anderson.

[14] He held this post until the death of Queen Anne in 1714. See: Comrie, *op. cit.* ref. 3, Volume 1, 264.

[15] Because it had been suggested that he had neglected their own garden. This was established in 1702, and located on a piece of ground just to the east of the Town's College. See: Comrie, *ibid.*, Volume 1, 265.

[16] See: Comrie, *ibid.*, Volume 1, 265. These were the Royal Garden at Holyrood Palace, the Garden in the grounds of the Town's College, that in Trinity Hospital (also referred to as the Town's garden) and that in High School Yards, associated with the Incorporation of Surgeons. The fate of the original Physicians' Garden associated with Dr Balfour's house is, however, unclear, although it is likely that it no longer served as a Physic Garden after the establishment of the Physic Garden in the grounds of Trinity Hospital. For further details about the various Botanical Gardens in Edinburgh during the 18th and 19th centuries, see: Comrie, *ibid.*, Volume 1, 266.

[17] Sir Robert Sibbald was appointed the first Professor of Physic in the Town's College, or University, on 25 March 1685. Later that year, on 4 September 1685, two additional Professors of Medicine were appointed. These were Drs James Halket and Archibald Pitcairne. See: Ritchie (*op. cit.* ref. 1), 25.

[18] This group of four succeeded Sibbald, Pitcairne and Halket, as well as James Sutherland, Professor of Botany from 1676, and William Porterfield from 1724, briefly Professor of Medicine. Andrew Sinclair MD Angers 1720 and John Rutherford MD Rheims 1719 were appointed Professors of the Theory and Practice of Medicine, while Andrew Plummer MD Leyden 1722 and John Innes MD Padua 1722 were appointed Professors of Medicine and Chemistry. Sinclair, Plummer and Innes were all pupils of Boerhaave, see: Turner, A.L. (1937). *Story of a Great Hospital: the Royal Infirmary of Edinburgh 1729-1929.* Edinburgh & London: Oliver & Boyd, 29.

[19] Gairdner, J. (1864). Sketch of the early history of the medical profession in Edinburgh. Being an Address delivered at a Conversazione in the Hall of the Royal College of Surgeons of Edinburgh, on 22d January 1864. *Edinburgh Medical Journal* **9**, 681-701, see p.700.

[20] Turner, *op. cit.* ref. 18, 39-67; Kaufman, M.H. (2003). *Medical education in Edinburgh during the 18th and 19th centuries.* Edinburgh: Royal College of Surgeons of Edinburgh, 39-42.


HIPPOCRATE DUCE NATURÆ MINISTRO
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A Brief History of the Royal College of Surgeons of Edinburgh

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The Royal College of Surgeons of Edinburgh has enjoyed a continuous existence as a corporate body since 1505. It may justly claim to be one of the oldest surgical corporations in the world. The Barber Surgeons of Edinburgh were formally incorporated as a Craft Guild of the city and this recognition is embodied in the Seal of Cause or Charter of Privileges which was granted to the Barber Surgeons by the Town Council of Edinburgh on 1st July 1505. The Seal of Cause is a remarkable document. It clearly established the role of the Incorporation of Barber Surgeons as a body concerned with the maintenance and promotion of the highest standards of surgical practice and this remains the prime purpose of the great international surgical brotherhood of the Royal College which has developed from the Incorporation. The Seal of Cause conferred various privileges upon the Incorporation, including the exclusive right of its members to practise surgery in Edinburgh and surrounding districts, but in return for these privileges, it imposed certain crucially important duties and obligations. The most important of these, which remains entirely appropriate to this day, is stated very clearly in the Seal of Cause. "that na maner of persoun occupie nor vse ony poyntis of our said craftis of Surregenie ... bott gif he be first frieman and burges of the samyn, and that he be worthy and expert in all the poyntis belangand the saidis craftis diligentlie and avysitly examinit and admittit be the maisters of the said craft ... that he knaw anotamell, nature and complexion of euery member humanis bodie, and inlykewayes he knaw all the vaynis of the samyn ... for euery man aucht to knaw the nature and substance of euery thing that he werkis, or ellis he is negligent." From its earliest origins the College has been an examining body principally concerned with the setting and maintenance of professional standards. Another vitally important obligation laid upon the Barber Surgeons was that of ensuring that all who practise the craft should be able to read and write and this literacy requirement is the earliest of any comparable professional body.

The Seal of Cause recognised the importance of a thorough knowledge of Anatomy for the practice of surgery and in order that the Incorporation might maintain a high standard of anatomical knowledge amongst its members it was granted the right to have the body of one executed criminal per annum for the purposes of anatomical dissection. Having regard to the very strong religious, cultural and social prejudices against dissection of the human body, this was indeed an extraordinary dispensation. The Seal of Cause was confirmed on the 13th of October 1506 by a Royal Charter granted by King James IV of Scotland, arguably the most interesting and attractive figure of the entire Stuart dynasty. A man of many diverse accomplishments, his long and stable reign was for Scotland a brief golden age. King James was particularly fascinated by medical science and we have clear evidence that he was an enthusiastic practical surgeon and dentist.

During the 16th Century the Incorporation met in the house of its Deacon but meetings were occasionally held in one of the aisles of St. Giles' Kirk and because of this the Deacon was sometimes referred to as the 'Kirk Maister'. The early records of the Incorporation are somewhat fragmented but the names of most of its early Office Bearers are recorded in minutes of the Town Council. From 1581 onwards, its records are complete. One of the most important landmarks in the early history of the Barber Surgeons is the Letter of Exemption granted to them by Mary Queen of Scots, the grand-daughter of James IV, on 11th May 1567. This notable document formally relieved members of the Incorporation from the obligation to bear arms in defence of the realm but obliged them to treat sick and wounded soldiers in the Queen's armies - and is the first formal statement anywhere of the non-combatant role of the army doctor.

Gilbert Primrose, who was elected Deacon of the Barber Surgeons on three separate occasions, was appointed Surgeon to King James VI of Scotland and when the King succeeded to the English throne, in 1603, Primrose went south with him and became Chief Surgeon to the Royal Household in London. Because of Primrose's prestige and the force of his personality, the status of the Incorporation of Barber Surgeons became progressively enhanced and, in 1583, it was formally recognised by the Town Council as the premier craft guild. Several members of the Incorporation gained wide experience of military surgery through service with various European armies during the Thirty Years War and many others later served in the Scottish Covenanting armies of the 1640s.

By the end of the 16th Century, a distinction had developed between the Barbers, who simply cut and shaved hair, and the Barber Surgeons, who also practised the more skilled craft of blood letting and other forms of surgery. The Surgeons gradually abandoned hair cutting and shaving, but frequent disputes arose between the two branches of the Incorporation concerning the rightful scope of their work.

During the first two centuries of its existence, the Incorporation of Surgeons admitted to membership those apprentices who had been trained for six years by master surgeons and who had given satisfactory service. A statutory fee had to be paid and the aspiring surgeon was required to produce his 'ticket' as a Burgess of the City of Edinburgh, but the most important condition of entry was the passing of an examination, conducted by the senior members of the Incorporation.

In 1647 the Incorporation acquired for the first time a permanent meeting place by renting three rooms of a tenement in Dickson's Close. Later, after joining forces with the Apothecaries, the Incorporation laid out in their grounds at Curriehill, the first Edinburgh Physic Garden. In this were grown all kinds of medicinal herbs which enabled the Surgeon Apothecaries to train their apprentices in the recognition of the plants which formed the basis of Materia Medica at that time.

By the end of the 17th Century, an increasing number of Edinburgh Surgeons had acquired a formal academic training in medicine and certain Physicians had begun also to practise surgery. The most notable of these was Archibald Pitcairne, who became Professor of Medicine in the University of Leiden where amongst his students were many Scots. He returned to Edinburgh in 1693 and joined the Incorporation of Barber Surgeons in 1701. The admission of Pitcairne and other 'Doctors' to the Incorporation did much to enhance its prestige and to establish surgery clearly as a reputable branch of medicine.

In 1695, the Incorporation was granted a new charter by King William III and Queen Mary, which confirmed the jurisdiction of the Surgeon-Apothecaries over the practice of surgery in Edinburgh and the south-east of Scotland. The charter also confirmed the Incorporation's responsibility for anatomical teaching and this prompted it to apply to the Town Council for more bodies for dissection. This was approved on the condition that the Incorporation provided an anatomical theatre. By 1697 "Old Surgeons' Hall", in High School Yards, was completed and the first public dissections took place in 1703.

The Faculty of Medicine in the University of Edinburgh was established in 1726 and no one did more to achieve this than John Monro, who was Deacon of the Incorporation of Surgeons from 1712 to 1713. Monro's son, Alexander Monro (Primus), became Professor of Anatomy in the

University in 1719 and his brilliance as a teacher attracted students from all over the British Isles and even from the North American Colonies. He also played a notable part in the establishment of the Edinburgh Royal Infirmary. The University Faculty of Medicine and the Royal Infirmary were responsible for the rapid development in Edinburgh of systematic medical teaching on a sound scientific basis. Surgery, however, suffered from the effects of a lingering academic prejudice against what was perceived to be a manual craft rather than an intellectual discipline. Formal surgical teaching consisted of only a few lectures appended to the University course in Anatomy. These surgical lectures were delivered by two successive Professors of Anatomy, Alexander Monro (Secundus) and Alexander Monro (Tertius), the son and grandson of Alexander Monro (Primus), who were physicians without any surgical training. This was bitterly resented by the Incorporation of Surgeons and prompted certain of its members to exercise their historical right to teach surgery independently within the city. The energy and enthusiasm of these teachers more than compensated for the surgical deficiencies of the University Medical Course and certain of them, most notably Benjamin Bell and the brothers, John and Charles Bell (to whom he was not related) did much to establish Edinburgh's reputation as a centre of surgical teaching.

On 22nd May 1778, King George III granted a new charter whereby the Surgeons were incorporated anew under the title "Royal College of Surgeons of the City of Edinburgh". A further charter, granted by Queen Victoria in 1851, completed the severance of the College from the Town Council and changed its title to its present form.

By the beginning of the 19th Century, the Old Surgeons' Hall had become inadequate for the College. William Henry Playfair, the foremost Scottish architect of that era, was commissioned to design a building containing a meeting hall, Museum, Lecture Room and Library. The original plans are preserved in the College archives and the handsome furniture, designed by him for the College building, is still in use to this day.

In 1884, the Fellowship Examination was re-introduced after a gap of 33 years. From its inception, the examination flourished and the recruitment of candidates increased steadily. A considerable number of those were from overseas and soon many Fellows of the College were to be found in senior surgical posts in Australia, Canada, New Zealand, South Africa, India and in all other parts of what was then the British Empire.

In July 1905, the College celebrated the fourth centenary of its Incorporation and the most important occasion was the conferment of the Honorary Fellowship upon 36 of the world's most distinguished surgeons. These included Lord Lister, the acknowledged "Father of Modern Surgery" who had become a Fellow in 1855 and he is the only Fellow of the College ever to be awarded its Honorary Fellowship. 1955 marked the advent of the Journal of the Royal College of Surgeons of Edinburgh, which, under the Editorship of Sir John Bruce, rapidly achieved world-wide recognition. The first College meeting outwith Edinburgh was held in 1960. This has been repeated every year since then. Some years later, senior Egyptian Fellows invited the College to visit Egypt and, in 1976, the first full scale College meeting to be held outwith the British Isles took place in Cairo and Alexandria. Further overseas meetings have been held all over the world. Her Majesty Queen Elizabeth II was graciously pleased in 1979 to grant the College its sixth Royal Charter.

The form and content of the Fellowship Examination has been progressively adapted, without any diminution of standards, to changes in surgical science and practice and in accordance with changing patterns of surgical training.

In the last fifty years the number of candidates presenting for the Fellowship examinations has been steadily increasing. In 1999, approximately 7,000 candidates from a wide range of countries were examined. It is clear that the Fellowship diploma is prized worldwide as an internationally recognised criterion of sound surgical training. The appearance of an increasing number of candidates from European countries is a most welcome development. Since the first College examination to be conducted outside Edinburgh took place in Hong Kong in 1965 Fellowship examinations have been held in Singapore, Kuala Lumpur, Kathmandu, Yangon (Rangoon), Mumbai (Bombay), Chennai (Madras), Kuwait and Riyadh.

Today the College has over 14,000 Fellows and Members, of whom over 6,000 live in the UK, fulfilling the prime purpose of the College - the maintenance and promotion of the highest standards of surgical practice and surgical training.

Over the past 25 years the College has become increasingly involved in the provision of surgical education and the promotion of surgical research.

Today the College organises training courses, surgical skills workshops, seeks to promote patient-oriented research in clinical surgery and conducts full-scale scientific meetings both at home and overseas. It has developed SELECT, a distance-learning programme for Basic Surgical Trainees, and the recent establishment of its Faculty of Medical Informatics will undoubtedly facilitate the further rapid expansion of its educational role.

With the approach of its Quincentenary, in 2005, the College can take satisfaction from the fact that, in addition to setting standards through the award of its Diplomas, it is now also striving to provide the educational means whereby these standards can be achieved and maintained. To mark this Quincentenary, Dr Helen Dingwall is writing a new History of the College. This will be a record of how a local Craft Guild in the capital city of a small poor nation on the fringe of Europe developed over 500 years into a large international organisation of high repute, with a prestige and influence which transcend all political, ideological and ethnic barriers.

It will be a record of notable service to Humanity, of which all Fellows of the College can be justly proud.

A Short Circular History of Vitamin D from its Discovery to its Effects

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The discovery of vitamin D

It was as early as the mid-1600s that Whistler[1] and Glisson[2] independently published scientific descriptions (in Latin!) of rickets, caused, we now know, by a vitamin D deficiency. However neither treatise recognised the crucial role of diet or exposure to sunlight on the prevention of this disease. Around 200 years later, in 1840, a Polish physician called Sniadecki realised that cases of rickets occurred in children living in the industrial centre of Warsaw but did not occur in children living in the country outside Warsaw. He surmised that lack of exposure to sunlight in the narrow, crowded streets of the city where there was considerable pollution due to the burning of coal and wood, caused the disease. Such a view was poorly received at the time as it seemed inconceivable that the sun could have any useful benefit on the skeleton. The prevalence of rickets increased as industrial processes and labour expanded and, by the end of the nineteenth century, this bone disorder was estimated to affect more than 90% of children living in such urban polluted environments in Europe. Similarly, as Boston and New York City grew in the late 1800s, so did the number of cases until, in 1900, more than 80% of children in Boston were reported to suffer from rickets.

In 1918 Sir Edward Mellanby discovered that beagles, housed exclusively indoors and fed a diet of oatmeal, developed rickets but that the addition of cod liver oil to the food treated the disease successfully[3]. He wrote in 1921 *"The action of fats in rickets is due to a vitamin or accessory food factor which they contain, probably identical with the fat-soluble vitamin"*. Various experiments by Hess, Steenbock and Black in the 1920s followed in which excised pieces of rat skin were UV-irradiated or rat food was UV-irradiated. It must have been astonishing at the time to establish that both could be used as a dietary source to treat rats with rickets. Concurrently the first fat-soluble vitamin (A) and water-soluble vitamins (B and C) were being discovered; the factor protecting against rickets was known to be fat-soluble and was given the next letter in the alphabet – D. It was classified as a vitamin although it was recognised from the beginning that it was not necessarily required as a dietary constituent.

The chemical structures of the various forms of vitamin D were determined in the 1920s and 1930s by Windaus and colleagues[4] in Goettingen, Germany. Windaus was awarded the Nobel Prize in Chemistry in 1928 "for services rendered through his research into the constitution of the sterols and their connection with the vitamins". The biologically active form of vitamin D, found in the skin and called D_3, was characterised in 1936 (see *Figure 1*), and was shown to result from the ultraviolet (UV) radiation of 7-dehydrocholesterol. Thus vitamin D was established as a steroid. Very soon after this, the component in cod liver oil that prevented rickets was identified as vitamin D_3.

Vitamin D in the diet is present as either vitamin D_2 if the source is plant, or D_3 if animal. Few foods naturally contain vitamin D. Most is found in oily fish such as salmon, meat and eggs. Fat spreads and breakfast cereals are fortified with vitamin D. In the States orange juice, milk and some breads are also fortified. In the 1930s, vitamin D was added to many more American food-stuffs including peanut butter and hot dogs and even to a beer, marketed as having "sunny energy".

For most people living "normal" lives, more than 90% of their vitamin D requirement is derived from exposure to the UV radiation in sunlight. The body has a huge capacity to produce vitamin D: for example, exposure of 6% of the skin surface to summer sunlight for approximately 30 minutes around noon on a clear day in the UK would be equal to ingesting about 10 mg vitamin D. A 25(OH)D blood level of between 50 and 125 nmol/L (20-50 ng/mL) is considered optimal, with levels below 25 nmol/L indicating severe deficiency. An interesting study published in 1995[6] involved the crew of an American submarine and revealed a steady decline in the 25(OH)D concentration from a starting level of 78 nmol/L to 48 nmol/L after 2 months under the sea. This was despite a Navy diet that included milk and breakfast cereals fortified with vitamin D. Since the 1960s, a daily dietary allowance for children of 10 mg vitamin D has been recommended – this was based on nothing more scientific than the vitamin D content of a teaspoon of cod-liver oil! In adults 5mg daily was recommended. Many experts today believe that these values are too low by several-fold.

Too much vitamin D does you no good

It has been recognised for more than 50 years that too much vitamin D can result in intoxication, possibly due to the increased activity of $1,25(OH)_2D$. This is manifest by nausea, vomiting, poor appetite, weakness and weight loss. Calcium levels are raised in the blood leading to a confused mental state and heart rhythm abnormalities. Calcinosis can also occur. There is no evidence that sun exposure, even at high levels, can cause vitamin D intoxication, and diet is also unlikely to either, although this can happen on occasion. After the second World War, excess amounts of vitamin D were added to some milk products and this resulted in sporadic outbreaks in Britain of vitamin D intoxication in infants and young children[7]. Such an outcome is not entirely past history as vitamin D toxicity was reported as recently as last year to occur in babies in Japan who had received prolonged feeding of premature infant formula with a high vitamin D content.

With increasing interest by the general public in a "healthy" diet, it is possible that toxicity could occur nowadays from a high intake of vitamin D in supplements, such a multi-vitamin pills. The safe upper limit recommended for the ingestion of vitamin D is generally considered to be 25 mg/day for infants and 50 mg/day for all other ages, although some reports suggest that amounts considerably higher than these would still not represent a health hazard[8].

Too little vitamin D does you no good

As vitamin D plays a major role in the growth, development and maintenance of bone health, any deficiency leads to mineralization defects with an increased risk of osteoporosis, osteomalacia and fractures in adults, and rickets in children with a decrease in their genetically programmed height. An exciting discovery was made in 1979 by Stumpf and colleagues[9] that vitamin D receptors are present in many part of the body, in addition to the obvious locations associated with calcium metabolism - the gastro-intestinal tract, bone and kidney. This work led to the idea that vitamin D deficiency may be important in various non-skeletal disorders. Subsequently $1,25(OH)_2D$ was demonstrated to inhibit the proliferation of several cell types, to stimulate them to differentiate and, most recently, to act as an anti-apoptotic factor. As a result of these various properties, many physiological functions have been attributed to vitamin D, including stimulation of insulin production, modulation of antigen presenting cell and T lymphocyte activities, prevention of inflammatory bowel disease, photoprotection of skin and reduction in blood pressure (*reviewed in* [10]).

In addition to this remarkable list, vitamin D has been proposed to lower the risk of several types of internal cancers and autoimmune diseases. Evidence to support this hypothesis has been gathering over the past 20

years or so with Cedric Garland and colleagues in the States being the first to note the association[11]. More recent work along similar lines has been carried out by William Grant[12]. The main indications have come from epidemiological studies at a population level in which a latitude gradient has been established for various tumours, such as colorectal, large bowel, breast and prostate. The results revealed that the lower the latitude, and hence the higher the ambient sun exposure, the lower the risk of developing or dying from these cancers. Similar studies reached the same conclusion when the autoimmune disease, multiple sclerosis, was considered[13]. For example, in Australia where the genetic background of the population is similar throughout the whole country, the prevalence of multiple sclerosis per 100,000 people is 12 in N.Queensland at latitudes of 12-23°S and 76 per 100,000 people in Tasmania at latitude 45°S. It seems that high exposure to the sun during childhood and early adolescence is particularly related to a reduced risk of multiple sclerosis. Further reports have associated the consumption of vitamin D supplements with a lowered risk of cancer development.

So, how common is vitamin D deficiency? Many experts agree that babies who are entirely breast-fed (there is little vitamin D in human milk) and the elderly who seldom venture outdoors are frequently vitamin D deficient. For the ages inbetween, much controversy exists at present. Some argue that many working adults and children who do not spend much time outdoors or who rarely exposure their skin to sunlight may be at high risk of vitamin D deficiency, especially during the winter period. Astonishing figures have been published recently, such as 40% of the US population, 48% of girls aged 9-11 years old and 80% of nursing home ofpatients suffer from a vitamin D insufficiency. Even in areas of the world intense insolation such as Queensland, high rates of vitamin D insufficiency have been reported. Indeed the lack of vitamin D has been called "an unrecognised epidemic" in adults over 50 years of age.

How do we ensure a "perfect" amount of vitamin D?

As almost all of our vitamin D normally comes from the action of sunlight on our skins, attempts have been made to calculate how much exposure is required to maintain adequate vitamin D levels for good health. For several reasons, such estimates are very difficult to establish.

First the amount of UV radiation in sunlight varies markedly depending on factors such as the time of day, season, latitude, cloud cover and aerial pollution. Because of the zenith angle of the sun to the earth in the early morning and late afternoon and in winter, most UVB photons are efficiently absorbed by the ozone layer. As a result, little or no UVB reaches the skin and so the production of vitamin D_3 does not occur. Therefore sun exposure between the hours of 10 am and 3 pm in the spring, summer and autumn is crucial. As vitamin D_3 is fat soluble, it can be stored in the body fat, thus providing a means of seeing us through the winter months when there is essentially no solar UVB irradiation.

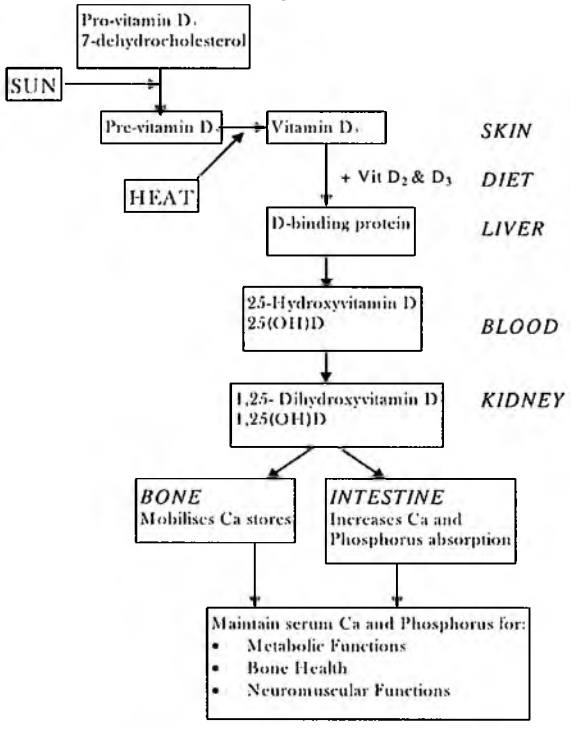

Figure 1. The metabolic pathway and functions of vitamin D

Secondly human behaviour with respect to sun exposure is very variable. In some cases, clothes are thrown off and lying in the full sun to develophe increased risk of skin cancer induction due to excessive sun exposure is taken into account with the wearing of protective clothing, hats, sunglasses and use of sunblocks. For example a sunscreen with a sun protection factor of 8 (thus allowing 8x greater time in the sun without burning) reduces the capacity of the skin to produce vitamin D_3 by more than 95%. What a dilemma – how to exposure yourself to sufficient sun to ensure the production of vitamin D while, at the same time, not increasing your chances of developing skin cancer!

Michael Holick, in particular, has put forward the view that the population at large in developed countries may be becoming vitamin D deficient. He published a book in 2004 called "The UV Advantage". In it, he explained how we need solar irradiation on unprotected skin to create vitamin D. This point was considered contrary to government health warnings regarding the dangers of being out in the sun, and Holick was asked to resign late in 2004 from the Department of Dermatology at the Boston School of Medicine.

The consensus view at present is that we should expose ourselves to an "intelligent" amount of sunlight. The dose should certainly be less than that required to redden the skin. Indeed as little as exposure of the hands, arms and face 2-3 times weekly for 15 minutes on each occasion when the weather allows is probably sufficient[14,15].

So the history of vitamin D is certainly not at an end. The story continues to unfold, even after 400 years of research, and more revelations will surely follow as further knowledge regarding this intriguing molecule emerges.

References

[1] Whistler D. Morbo puerili Angorum, quem patrio idiomate indigenae vocant The Rickets. *Lugduni Batavorum,* 1-13 (1645).

[2] Glisson F. De Rachitide sive morbo puerili, qui vulgo The Rickets diciteur, London 1-416 (1645).

[3] Mellanby E and Cantag MD. Experimental investigation on rickets. *Lancet* 1919: **196**, 407-412

[4] Windaus, Linsert O, Luttringhaus A and Weidlinch G. Uder has krystallistierte Vitamin D_2. *Justis Liedigs Ann Chem* 1932: **492**, 226-231

[5] Holick MF. Vitamin D: new horizons for the 21st century. McCollum Award Lecture, 1994. *Am J Clin Nutr* 1994: **60**, 619-630

[6] Dlugos DJ, Perrotta PL and Horn WG. Effects of submarine environment on renal-stone risk factors and vitamin D metabolism. *Undersea Hyperb Med* 1995: **22**, 145-152

[7] Bauer JM and Freyberg RH. Vitamin D intoxication and metastatic calcification. *J Am Med Assoc* 1946: **130**, 1208-1215

[8] Vieth R. Vitamin D supplementation, 25-hydroxyvitamin D concentrations and safety. *Am J Clin Nutr* 1999: **69**, 842-856

[9] Stumpf WE, Sar M, Reid FA et al. Target cells for 1,25-dihydroxyvitamin D in intestinal tract, stomach, kidney, skin, pituitary and parathyroid. *Science* 1979: **206**, 1188-1190

[10] Holick MF. Sunlight and vitamin D for bone health and prevention of autoimmune diseases, cancers, and cardiovascular disease. *Am J Clin Nutr* **80 (suppl)** 2004: 1678s-1688s

[11] Garland CF, Shekelle RB, Barrett-Connor E et al. Dietary vitamin D and calcium and risk of colorectal cancer: a 19-year prospective study in men. *Lancet I* 1985: 307-309

[12]. Grant WB. An ecologic study of dietary and solar UV-B links to breast cancer mortality rates. *Cancer* 2002: **94**, 272-281 (2002).

[13] Ponsonby A-L, McMichael A, van der Mei I. Ultraviolet radiation and autoimmune disease: insights from epidemiological research. Toxicology 181, 71-78 (2002).

[14] Holick MF. Vitamin D: a millennium perspective. *J Cell Biochem* 2003 **88**, 296-307

[15] Garland CF. More on preventing skin cancer. Sun avoidance will increase the incidence of cancers overall. *Br Med J* 2003: **327**, 1228

Chair-Making For Beginners - Illustrated by Some Episodes in the Career of John Thomson (1765-1846)

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Introduction

John Thomson is arguably one of the most interesting characters to have been associated with the Royal Medical Society. His interests were wide ranging; from military surgery and the treatment of venereal disease (two areas often closely connected in those times) to chemistry and the newly emerging specialty of pathology. It is, however, with his interest in medical education and his ability to persuade those in authority to create professorial chairs for himself to occupy that I shall deal in this article.

Thomson had no less than three professorial chairs created for him, prompting Robert Knox (Burke and Hare's main customer) to refer to him splenetically as the "old chair maker". Knox, however, was not above putting himself forward to sit as Thomson's successor in one of them. Thomson's success can probably be put down to his being the right man, at the right time, in the right place, with the right subject, the right gimmick and the right friends.

The right man

John Thomson was a man of remarkable tenacity and vision as well as of courage. He also appears to have been one of genuine humanity, coming out of semi-retirement to take over the practice of a deceased colleague in order to provide for his friend's widow. It is said that he gave up a career in surgery because he could no longer face inflicting pain in these pre-anaesthetic days.

He was born in 1765 in Paisley, the son of a silk weaver in reduced circumstances. He had been employed by a number of masters from the age of eight until, at the age of eleven, he was apprenticed for seven years to his father to learning the weaving trade. When he showed more interest in studying than in weaving his father wanted him to become a minister rather than a doctor as the initial expenses would be less and the career prospects more secure. In 1785 John Thomson prevailed over his father and he was apprenticed to a Dr White in Paisley. Thomson then went on to spend the session 1788-1789 studying in Glasgow but the next year came to Edinburgh. His clinical and financial acumen was shown at that time when he refused to enrol for (and pay up front for) a course of a year's lectures given by the great Dr William Cullen. After attending the first free "taster" lecture Thomson was said to have remarked that Dr Cullen looked too frail to last the course and that he did not have money to throw away if he was not going to get all he had paid for. His prognosis proved correct as Cullen died before delivering half of his lectures.

Figure 1: This is the only watercolour in the University of Edinburgh Library which can be almost certainly identified as being one of the Thomson collection as it is annotated on the reverse:

"Hotel Dieu de Lyons 12th Sept 1823."

It is known that Roberts Carswell was in France at this time and he did visit the Hotel Dieu. What it depicts is rather more problematical; possibly ulcers on the heels

Figure 2: This is annotated on the reverse:

"Sloughing gangrene of leg & foot"

It is possible that this is an example of one of the cases seen and sketched by Thomson himself when he visited the wounded after the battle of Waterloo.

Thomson joined the RMS in 1790 and became a president in 1791, the same year in which he became assistant surgeon's clerk (equivalent to house surgeon). His health was not good; he suffered from asthma, and, in 1792, he had to resign his post in the RIE. He then spent some time at John Hunter's school of medicine in London. He returned to Edinburgh in 1793 and, becoming a Fellow of the Royal College of Surgeons of Edinburgh, was allowed to attend as a surgeon at the RIE. Seven years later, in 1800, he became the youngest of the six official permanent surgeons to the Infirmary (the equivalent of a consultant). He was then in a position to start to bring about reform in the medical curriculum in Edinburgh.

The right place and time

At the end of the eighteenth century the Town Council was worried about the status of the city. With the Union of the Parliaments in 1707 the centre of power had moved south to London and the attendant loss of prestige was coupled with a gradually worsening financial situation. The sources of the Council's income were basically the same as they had been in medieval times and were inadequate for the demands of the day. (This eventually led to the town becoming bankrupt in the early nineteenth century.) One of the few assets attracting income to Edinburgh was the University and its Medical School. The value of this asset was being reduced, not only by the rise of the London medical schools but also by a feeling that some teachers were possibly resting a little on their laurels. The professors were appointed by the Town Council but over the years dynasties such as the Munros, the Gregories, and the Homes had come to dominate the Faculty. The danger in this sort of arrangement is epitomised in the performance of the now notorious Munro *tertius* who apparently delivered his lectures on anatomy by openly reading out his grandfather's notes without expunging such phrases as, "When I was student in Leyden in 1719", which, considering that he had been born in 1773, was stretching the credulity of his listeners somewhat even in the days before active

Figure 3: This is annotated on the reverse:
"Large tubercles on omentum - Cancerous?"
It appears to be a case of pseudomyxoma peritonei secondary to a mucinous adenocarcinoma

learning. Even taking into account that his incompetence may have been exaggerated, that the quality of the teaching in the University was perhaps not as good as it could have been is shown by the number of extramural, non-University, lecturers who flourished in the town providing, amongst other things, for the deficiencies in the University Medical School.

There were several obstacles in the way of injecting new blood into the Faculty to improve the standard of the medical education provided by the University. The first was that the Senatus (i.e. a committee made up of the professors) was trying to assert its independence from the Town Council. The University had been founded by the Town Council as "the Tounis College" essentially to make use of a collection of books they had been left. The Senatus, however, were trying to make out that the University was a separate entity, not subordinate to the Town Council. They would thus not take kindly to dictation from the Town Council in affairs governing the quality of their teaching. Apart from pride there was another, financial, motive for resistance to any interference from the Town Council. There were two classes of medical professor in the University at that time: those whose classes were obligatory for any student who wished to take the degree of MD, and those whose classes were not. As the students paid their fees directly to the lecturers it was in the interest of the professors delivering compulsory courses to restrict their own number to keep up the attendance at, and thus their fees from, their own lectures. In addition, as each lecturer had such a large amount of material to cover, their lecture series often extended over two years, thus further increasing their income. Any attempt by the Town Council to introduce new chairs and make their lectures compulsory (as would be necessary to update the medical curriculum) would thus be strongly opposed by the Senatus.

Thomson's first attempt to improve medical teaching in Edinburgh by the creation of a new chair did not however meet with the approval of the Town Council but led him into direct conflict with it. In 1804 he became the first occupant of a Chair in Surgery created by the Royal College of Surgeons of Edinburgh (to provide an alternative source of teaching to that of Munro *tertius* whose brief as Professor of Anatomy covered Surgery as well). On hearing that Thomson was about to give his inaugural lecture the Town Council sent the College Bailie round to inform him that the Town Council was the only body who could create professors in Edinburgh and that, if Thomson persisted in lecturing, the bailie and his "heavies" would come round and stop the proceedings. Thomson called his bluff and the lecture course went ahead without the riot which would no doubt have ensued had the bailie tried to break up the party. (By all accounts medical students in those days were more physical in expressing their displeasure than is acceptable, or usual, nowadays).

Two years later Thomson obtained the chair of Military Surgery in the University. After his run in with the Town Council it is perhaps not surprising that the appointment was made by the Crown. This chair was seen as a roundabout way of improving the quality of surgical teaching under the guise of providing for the requirements for military surgeons created by the Napoleonic Wars. Thomson occupied this chair for the next sixteen years but when he resigned from it at the age of fifty seven his greatest achievement was yet to come.

The right subject

Whilst the Napoleonic Wars had provided an excuse for his second chair the third was justified by the emergence of the relatively new specialties of morbid anatomy and experimental pathology. Morgagni had started the morbid anatomy ball rolling; figures such as John Hunter and Matthew Baillie in London and Bichat and Cruveilhier in Paris had developed the concept of trying to explain disease in terms of the pathological changes observed post-mortem and the results of experiments. Thomson wished to promote this approach. He managed to persuade the government to issue a Commission in September 1831 instructing the Town Council to create a chair of Pathology (also making it an examinable, that is compulsory, subject) and to appoint himself to it. The Council grumbled but it knew on which side its bread was buttered and instructed the College Baillie to take Thomson (and John Turner, who had been appointed Professor of Surgery at the same time) to the next meeting of the Senatus to be inducted into their chairs.

It is at this point that the farce began. The secretary to the Senate was told that the new professors were to be inducted at the meeting of 11 October. He, however, forgot to send round the billets summoning the meeting and left Edinburgh for a few days to visit a patient. It was only on the 10th that one of the other professors realised that he had not received notice of the meeting and sent a University servitor round to remind everyone by word of mouth. In the event only seven members turned up and they were discussing other matters when the College Baillie arrived at the door with the new professors. That they were expected to induct the professors was news to the Senatus: they had not even finished formulating their response justifying why they did not want anything to do with the new chairs. Predictably they appointed a committee to try and persuade the baillie and the two professors to go away. They prevailed upon the baillie to return to the City Chambers to report that the Senatus was not ready for the new chairs. This ploy succeeded and the baillie and his unwelcome companions went back to the High Street to seek further advice. Whilst he was away the Senatus decided that the best thing was for them to close the meeting on the grounds that they had not been summoned by letter and the meeting was thus unconstitutional. Unfortunately, they took so long to think of this way out of their predicament that they were still debating it when the College Bailie returned with the professors saying that the council insisted on the professors being inducted without delay. The Senatus had no alternative but to acquiesce. Despite numerous pamphlets and attempts to suppress the chairs over the next few years both have survived to the present day.

Figure 4: This is annotated on the reverse:
"Usual appearances of recent pleurisy with spots of partial suppuration on the surface of lung"
It appears to be a case of suppurative pneumonia with pleurisy

The right gimmick

One of the points that Thomson made in his application for the Chair of Pathology was that he had "procured from Hospitals at home and abroad, with considerable pains and difficulty and much expense, a large collection of Coloured Delineations of the Morbid Alterations of Structure which occur in the different Textures and Organs of the Human Body". This was a considerable advance for the time. Using pathological specimens for teaching had drawbacks. Formaldehyde had not yet been discovered and alcohol was the only available preservative. This has the disadvantage of hardening, shrinking and decolourising tissues preserved in it. John Hunter had got round the problem by having wax models made of specimens but this was a very expensive solution. Thomson sent his son, William, and Robert Carswell (later Professor of Pathology at University College, London) round the hospitals of Britain and Europe looking for likely specimens and painting them in watercolour. The collection eventually ran to 2400 images and was bought by the University in 1857 for the relatively enormous sum of £350. It has since disappeared, apart from a few watercolours in the University Library which probably formed part of it.

The right friends

Thomson had powerful political friends, probably made when he held a series of chemistry classes in 1799-1800. At that time it was a popular pastime for the legal fraternity to go to scientific lectures and demonstrations and it is probable that there Thomson made useful political acquaintances amongst up and coming politicians. His political leanings were to the Whigs (who were in power when he was appointed Professor of Pathology) whilst the Town Council and the Senatus were Tory. In fact, at one time he was thought to be a dangerous radical associated with "The Friends of the People", an organisation asking for a modest extension of the vote but regarded at the end of the eighteen century as a subversive organisation, membership of which could lead to execution or transportation.

In summary, Thomson was a remarkable man. He published on chemistry, inflammation, lithotomy, smallpox vaccination, hospital administration, medical education and the life and work of William Cullen. He researched on necrosis, callus formation, hernia, haemorrhage, and the use of mercury in syphilis. (He preferred to use sarsaparilla). He gave the first lectures in Edinburgh on diseases of the eye, systematic surgery and military surgery, and was the first to organise his lectures on the practice of physic on an anatomico-physiological basis. It is, however, probably for his influence in improving the teaching of medicine at the beginning of the nineteenth century by adopting new methods and increasing the range of subjects and number of teachers that he should be best remembered. As a parting thought, even if he had not done any of these things, he would have made a significant contribution to medicine as it was he who gave JY Simpson his first job in Edinburgh and prevented that impecunious student from embarking for India as a ship's surgeon.

Notes

There is a file of varied medical images in Special Collections in the University of Edinburgh Library. They vary from early photographs of skin conditions to copies of illustrations in 19th century pathology journals. Amongst these are a small number of watercolours mounted on card with tabs for hanging made out of red lawyers tape. These are possibly all that remains of the Thomson Collection of watercolours. A selection are shown in this areticle.

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HIPPOCRATE DUCE NATURÆ MINISTRO
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PathCAL - The Saga So Far

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Many Edinburgh medical students will be familiar with the set of computer-assisted learning programs (CALs) called PathCAL, which help the user understand the basic pathological principles of disease. Currently we have approximately 110 programs running on the Web, available to anyone with access to the Edinburgh Electronic Medical Curriculum (EEMeC). These programs did not spring into being overnight: their gestation was long and frustrating. I am taking up the offer to relate it, although I am acutely aware that writing about the history of anything from personal experience is a real sign of advancing years.

So how did the system emerge? We have to go back a long time. In 1983, I took up a post as lecturer in pathology in the University of Leeds. The head of department was then Professor Colin Bird, later Dean in Edinburgh. He was keen on modern technology and had recruited a trainee pathologist, Pat Harkin, who had a strong computing interest. Around this time Pat devised a program that would allow academics with limited technical expertise to write scripts for computer-assisted learning programs directly on to computer. These programs would run on a BBC computer, which was then the state of the art model. A number of trainee and consultant pathologists were delegated to write scripts for interactive tutorials on various topics. Despite the intention, however, few staff members developed the small amount of expertise necessary and in practice Pat inserted the material for them. The idea of the programs was to allow students to work though text and questions on a topic in pathology, related at suitable points to macroscopic and microscopic pictures of diseased tissue. At that time computers were much more primitive than now and it was not technically possible to put the images on the computer screen. They were instead accessed in photograph albums and students were directed to "look at picture A5". These were replaced by computer-controlled microfiche projectors and later we advanced to computer-controlled slide viewers, there being a separate one for each computer. There were about 12 terminals, located in the Pathology Department museum, and these ran on a small network with a hard drive in a nearby cupboard. The system was pretty clunky, but we were very proud of it. We were struck by its popularity with students, no doubt partly due to its novelty. Professor Bird was at all times encouraging and enthusiastic and played a full part in dragging off hapless visitors from other universities to see the system in action. At one point he even floated the idea of ditching our other teaching methods, but after some discussion we decided that this would be too radical.

In 1986 Professor Bird moved to Edinburgh as professor of pathology and engaged Pat Harkin to set up a set of computer-assisted learning programs similar to those in Leeds. This parallel set ran in Edinburgh for some years.

By the early 1990s computing technology had moved on. The BBC computer was becoming effete and the slide carousels gradually stopped working. Servicing the network became progressively more difficult and eventually the hard drive crashed. With some skill, Pat rescued the data and printed the text of the programs before the system finally expired.

At this time, at the request of the Wellcome Trust, Pat devised a new program called video-active program author (VIPA) that allowed a non-expert to insert questions and text into a set of templates. VIPA ran on IBM PC hardware but was written before Microsoft Windows became popular. Nevertheless it was the first time that it became possible to put the images on the same screen as the text. This gave us the opportunity to create a new version of our programs in Leeds. Originally the intention was to transcribe the text of the old ones, but, when we reviewed the printed versions of these, we realised that they had limitations. They did not fully exploit the potential interactivity that is one advantage of a computer-based system. As the programs had been written by different individuals, they differed markedly in style, which in some cases was rather heavy and academic. Many of the slides used as pictures were of poor quality. Much of the microscopy was of archaic tissue from ancient student histology class boxes. We eventually decided to write a new set of programs from scratch. I undertook to do this, as we reckoned that it was probably easier to have a uniform style and have others criticise the content than to have different people write them and then edit the text. At this time I acquired a new computer, a PC, which greatly expanded the possibilities. In 1993-94 I wrote about 70 tutorials, typing the text directly on to computer. This was nearly all done outside normal working hours.

During this time digitised images become more readily available and it was possible to incorporate these into the programs, rather than on separate machines. I took a lot of new images, using specially prepared high-quality material from the diagnostic pathology service, to replace the old ones. We included preparations by techniques such as immunohistochemistry and oil-immersion microscopy of specially cut thin microscope sections showing cell organelles. Cameras and microscopes were also of high quality. We took films and projection slides to the local chemist's shop, where they were digitised and given back to us on compact discs (CDs). On one occasion they gave me in error someone's family snapshots, but I never discovered whether the possessor concerned was in turn presented with a CD of tumours. The draft scripts were printed and passed round the critical eyes of sundry colleagues for amendment. So gradually a lot of individuals had an input into their content and their names are still present at the beginning of each CAL program.

We ran our CAL packages on a small network of 12, located as before in the Pathology Department museum. By this time, however, the computer network of the whole university was becoming more sophisticated and we felt that if we could run the system on it we could increase access dramatically. Unfortunately the VIPA system turned out not to be compatible with the university network. A short spell of despair followed, as the prospect of much wasted effort loomed. Fortunately, Pat had a contact, Kim Whittlestone, then in Bristol, who had devised a set of templates that ran on the package Asymmetrix Toolbook, which could be made to run on our university network. With some effort Pat wrote a program that would import our cherished VIPA tutorials into Toolbook. We were thus able to get our programs to run on the network in Leeds. As it happened, we also organised the undergraduate courses for medical and dental students and were able to direct the attention of large numbers of students to the programs, as part of their resource material.

In 1996 I decided on a career shift and moved to Edinburgh, where Professor Bird had become Dean of the Medical School and the academic head of the Pathology Department was Professor Andrew Wyllie. I found that the computer-assisted learning system Professor Bird had transposed in 1986 had by then moved on, but in a slightly different direction from that in Leeds. In Edinburgh, a set of programs was running on the University network but had been written in the package Authorware. This demanded the wizardry of a computer programmer and he had unfortunately left, so that nobody was available to continue the work. With advice from Andrew Short and Gill McConnell in Veterinary Medicine I tried to learn Authorware, but without success. With Pat Harkin's considerable aid I got the Toolbook CAL programs set up in Edinburgh and, with the help

of Susan Wexler, who had responsibility for the computing network in Medicine, we were able install the programs. As Authorware and Toolbook were mutually incompatible we had to run the two systems separately. Fortunately I became proficient in Toolbook and was able to write more programs with the templates. Mark Arends in Pathology also learned to use Toolbook and wrote some tutorials on genetics.

By this time I realised that, in developing any learning technology, the use of well-recognised principles of learning psychology could readily enhance the student's learning. Chunking, for example, is the technique of breaking material into small, easily digested units, rather than having great screenfuls of closely-packed text. Rehearsal is the process of reiterating the material, often in slightly different format. For example, information can be presented as free text questions and then later as multiple choice questions. Vivid imagery, with graphics, animations and video material, is also likely to be remembered. Dual encoding is when information is presented in more than one format, for example visually and by sound. We have not so far exploited this, partly because having sound on programs in a computer cluster would cause disturbance, although this could be overcome with headphones. These are well-researched principles and facilitate the encoding of information into short and long term memory. I attended a few of the honours psychology classes run by Hamish MacLeod and Charles Anderson. The medical school's educational experts, Gordon Watson and Phillip Evans, became interested in the psychology aspect of computer-assisted learning and we conducted some studies in this field. An essential overall aim of all this is to promote a deep approach, rather than a surface approach to learning and the extent to which the programs can do this would be an interesting research project.

At this time the programs were used mainly by Years 2 and 3 students studying pathology. We undertook evaluation questionnaires and found that the popularity of the computer-assisted learning programs among students was high. Professor Andrew Wyllie was also keen on computer-assisted learning, as were other colleagues, including Raashid Luqmani, of Rheumatology, and Mark Arends, Andrew Krajewski Alistair Williams and others in Pathology. We set up a CALs group, which met regularly to plan further development.

By 1998 it was becoming clear that the future lay in making the system Web-compatible. Unfortunately neither Toolbook nor Authorware at that time existed in versions that would run on the Web. Raashid Luqmani spent much time writing programs that might transfer the CALs to the Web, but the technicalities of the University computing networks would not allow them to run. Andrew Krajewski, too, devised templates in FrontPage and we did some work on this, but again the University network beat us. As technology progressed, the network ceased to support Authorware and we had to ensure that its contents were replicated in the Toolbook CAL programs. We were, however, fortunate that David Dewhurst arrived in Edinburgh from Leeds and developed the Learning Technology Section (LTS). As this expanded, various individuals, notably Rachel Ellaway, Peter Douglas, Jake Broadhurst and Steve Fox became involved. With the development of the Edinburgh Electronic Medical Curriculum (EEMeC), it finally became possible to make the programs run on the Web. Stewart Cromar in LTS started this, but transferring the existing programs entailed laboriously copying and pasting all their components individually and was obviously going to be a big job. Professor David Harrison, in Pathology, obtained financial support and in 2001 this enabled Jackie Aim in LTS to start transferring the programs to Web-compatible format. We took the opportunity to update the content of the programs and this work was completed in 2004. They are currently available to students in Edinburgh and are also supplied to medical students in Cambridge, where Mark Arends and Kim Whittlestone have both moved and take an interest in their use. At some point I was asked to come up with a name for the pathology programs and invented the name PathCAL, for want of any better suggestion. As it widens to include other branches of clinical medicine, it needs changed, but other obvious names are already in use.

So what advantage does computer-assisted learning have over learning by other methods? Consider a textbook. Now, there has undoubtedly been a great advance over the years in the standard of textbooks. Modern textbooks present information beautifully, with fine coloured diagrams and photographs. There are, however, certain limitations. Many are fine academic works and the text tends to be written in a relatively turgid, concise style. This is splendid as scholarship, but the evidence from psychology suggests that it may not facilitate learning, especially by a beginner. There is also a serious limitation of space. The rather static pictures in a textbook, especially those of diseased organs, are often poorly annotated for the beginner. Pictures of microscopy are particularly difficult for those inexperienced in the pattern recognition skills that come only with much practice. In a computer package it is easy to delineate components with flashing outlines and to indicate different components in separate images. It is also easy, with computers, to reiterate information by building up diagrams step by step. Mind maps can also be built up in steps in a way that would be repetitious in a book, where conservation of space is a major factor. We can readily recapitulate information from other realms of knowledge. Thus, for example, in a discussion on renal or thyroid disease, we can reiterate material from immunology and thus seek to prevent the student from forgetting material previously learnt. More recently, we have incorporated animations and movie images, to show molecules moving together and interacting in easy stages, which is clearly not feasible in a book. The programs on cell signalling demonstrate the potential in this area. It is important to use these as genuine learning adjuncts and not just as gimmicks. They are time-consuming to do, but slowly we are incorporating them into programs.

Perhaps the most important aspect for learning is interactivity. A book can pose questions and give the answers, but in a computer program the user is forced to think and insert answers before s/he is able to continue. This interactivity is a very powerful way of promoting learning. By being forced to answer questions, the user cannot simply assume that s/he knows the material, as is the case when reading a textbook, and cannot fail to learn, especially if the questions are posed in different form later. In technical terms, of course, the computer recognises not the answer as such, but a string. It can thus be tailored to suit, for example, American spelling, or different synonymous answers. There is clearly a knack in devising and anticipating these. Although this interactivity is not explicit in a book, an experienced learner will interact with the material. In certain tutorials we give guidance on this and thus exploit the computer's potential in assisting learning by other modalities.

Then there is the question of keeping the material up-to-date. Any textbook will be out of date as soon as it is in the shops. A computer package, by contrast, can be updated regularly. Many of the improvements in the programs came from comments by students over the years and some students' names feature as editors or commentators. At present we do not have the staff to keep the programs as up-to-date as we would like, but hopefully in the future it will become possible. Computers also cater for distribution. A student can use it anywhere in the world with access to the Web. At present an Edinburgh medical student can gain access to the PathCAL on elective in the Far East or even on holiday on a Greek island, despite the risk of drenching the keyboard in ouzo.

More specifically, the PathCAL programs we have in Edinburgh aim to guide users on how to approach the study of pathology and medicine, apply general pathological principles to body systems and recognise certain abnormalities. This is done by explaining new terms and then forcing the student to use them to answer questions. The programs consistently give students feedback on their own knowledge and understanding and develop their ability to reason through disease-related problems. The programs can be used by beginners for primary learning or by more experienced students for self-assessment. Although the full set of tutorials is currently in use mainly by students of medicine, some would also be suitable for students of dental surgery, veterinary medicine, biology, nursing, paramedical specialities and for those studying for postgraduate examinations in surgical and medical specialities. As part of a study, Gordon Watson watched students at work and occasionally probed them. He was interested to note that beginners found the programs helped them understand and use correct terminology. This is part of the development of professional expertise, the so-called novice-expert shift.

The different question styles used in the programs have specific roles. For example, in the free response question, the student is invited to enter a short answer and the computer responds, often with embellishments.

There are also multiple choice questions comprising a stem and several items, each of which is either true or false: The student selects the answers and then follows the answers, with an explanation of why each correct answer is correct and why each wrong answer is wrong. The answers can be revealed after the student has answered each item either one at a time or as a group of five. The true-false format is now somewhat out of favour in summative examinations, but is still useful for promoting learning by formative testing. A further style of question is the modified essay in which the student enters a more detailed, discursive, answer. The computer then reveals a model answer and the student compares the two and awards him/herself a mark. This style of question allows deeper understanding to be tested. In constructing a tutorial, it is useful to progress towards these modified essays in the later stages, so that the student recaps on previous material. At the end of the tutorial the user gets a score; so self-deception is discouraged.

In updating the programs, the link to Email (*PathCAL@ed.ac.uk*) is very useful. Many students send comments and criticisms directly. In some cases these are to point out mistakes and in other cases they feel that something is not clear. Gradually the programs have been amended to incorporate these suggestions and in some cases the name of the student concerned has been included as a "user editor".

With the transfer of the Cal programs to the Web, it has become possible to include other devices. Video material, for example, can be streamed and added. We have a good deal of video material of real specimens, taken at autopsy or from surgically resected tissue. Pathologists now take images in digitised form, often as part of the report on a specimen, and we thus have enlarging banks of images at the ready. Some of this is on a searchable image database. As much diagnostic imaging in hospitals has now become digitised, it will in the future be easy to obtain material such as X-ray images, angiography, CT and MRI scanning images, all of which lend themselves well to incorporation into Cal programs. So the learning possibilities are enormous.
Recently, the Edinburgh Reusable Objects Sequencer (EROS) has been developed. This allows designated individuals to write programs directly on the Web. Other computer-assisted learning programs, such as George, the respiratory patient developed by Pat Warren, and Hannah, the pregnant woman, are also now developed using this system. This is clearly a great advance, although it does illustrate one difficulty, namely keeping abreast of changing technology. The whole system on which the PathCAL programs run is now in its fourth generation and each time the components have had to be copied across. The computer packages for constructing diagrams and photographic equipment for taking images change with breathtaking speed.

At various points over the years we have undertaken evaluation studies and these regularly show a high degree of student satisfaction with the computer-assisted learning programs in Edinburgh. They regularly turn out to be the most popular learning method in the Year 2 medical course. This is very encouraging and gives grounds to be optimistic about their future.

The PathCAL system also now records the answers students put to the questions. This is known as tracking. We can call up a list of all the answers users have inserted to every question in every CAL program. This is anonymous in that we cannot trace the user, but it allows us to see how questions perform. If certain correct answers are being rejected, we can amend the answer required. If users regularly insert certain wrong answers, this suggests that there are consistent misunderstandings and we can amend programs, or alter other aspects of teaching, to pre-empt these. Potentially, this could link to computer-assisted assessment, in which students take examinations on computer, but we have not yet developed this in relation to PathCAL in Edinburgh.

So what of the future? Almost from the inception of the programs we have aimed ultimately to make them available to students more widely than in one medical school. This requires certain technical features, namely a dedicated server, so that when large numbers of outside users log on, the computing network in Edinburgh does not crash. We are currently attempting to acquire financial support for this. The intention at present is that medical schools and other institutions would subscribe a nominal sum to allow their students to gain access to the programs. It is also a requirement that users log on, as the university must keep track of individuals who are interacting with, rather than merely looking at, material on its servers. This would clearly require some supportive technical infrastructure.

To keep the programs up-to-date we would in due course need a team of writers. It is obviously important to imagine how a beginner would use a program and address the issues that s/he might find difficult. Part of PathCAL's appeal is that the writing style is informal and even chatty. Many academics do not find it easy to write as they would speak; it is entirely different from the formal style we learn to use in writing scientific papers. Personally, I find it fun and intellectually taxing in its own way. Having a juvenile sense of humour may also be an asset. We can now give several individuals on-line authoring rights to the one tutorial. An advantage is that it can be done anywhere with Internet access, although I wait in vain for paid leave of absence in an alpine ski resort to write more material. A system for dealing with Email correspondence would also be desirable. There are also legal considerations in expanding the system. A further development would be to construct so-called intelligent tutorials. These would change in response to user needs, so that someone who gave correct answers to test questions could move into different, more difficult areas during a program. There is further educational research work to be done exploring the use of tutorials in expanding student learning.

Will computer-assisted learning replace books and other learning methods? I do not think so. There is still something pleasant about learning by sitting with a book in front of you. Also, it is important to be able to learn from the formal prose of a textbook: translating this into useful knowledge is, in its own way, all part of the learning process. Participating in a tutorial is also a perfectly legitimate way of enhancing one's learning. Furthermore, some people just do not like computers and there is nothing wrong with that. So books, tutorials and other learning methods will still be with us. But computer-assisted learning, too, has its place and is here to stay.

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References

Harkin PJR, Dixon MF, Reid WA, Bird CC. Computer assisted learning systems in pathology teaching. *Medical Teacher* 1986;**8**:27-34.

Reid WA, Arends MJ. Evaluation of computer-assisted learning program question styles and integration into a general pathology course. In "Evaluation Studies", **1998**. Editor: Nora Mogey. Learning Technology Dissemination Initiative Press, Edinburgh UK. **ISBN 095287315** X. pp19-21.

Reid WA, Harvey J, Watson GR, Luqmani R, Harkin PJR, Arends MJ. Medical student and tutor evaluation of interactive computer-assisted learning programs embedded in a general pathology course. *Journal of Pathology* 1999; **187** Supplement, 31A.

Reid WA, Harvey J, Watson GR, Luqmani R, Harkin PJR, Arends MJ. Medical student appraisal of interactive computer-assisted learning programs embedded in a general pathology course. *Journal of Pathology* 2000; **191**: 462-465.


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"Brother, Father, Mister, Doctor!" - From a Missionary Surgeon in the Philippines

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The children's faces lit up the darkness of the night. I had come with Bong, a Filipino, to treat a young child with a cough and high fever. The girl was sat with her 3 young sisters on a bench outside their 'house', a flimsy wooden shack which was their home. "*Brother James*", "*Father James*", "*Mister James*", "*Doctor James*" they chimed simultaneously jumping up and down with excitement. "*Just call me James*" I responded in the local dialect, "*much easier*". After speaking to the mother and examining the child we prescribed the appropriate antibiotics. "*Keep it in the fridge*" I advised the mother. Bong coughed, trying to give me a subtle hint. I looked at Bong and he smiled at me through the candlelight. The light bulb came on in my mind "*of course, the candles...these houses don't have electricity never mind a fridge*". I spoke to the mother once more "*OK, we will come back every day to administer the medicine*". As we snaked our way back home through the coconut trees, tired but content, my steps made lighter by the gleeful voices of the children ringing in my ears, the days of ward rounds, white cell counts and chest x rays seemed but a distant memory...

I had been in the beautiful and exciting Philippines for only a few months having joined the Verbum Dei Catholic Missionaries six months before. I had met them in Sydney, Australia where I had been doing a Research Fellowship in Plastic Surgery, looking at Distraction Osteogenesis, a technique to lengthen the shortened mandible. I had loved my time in Australia, the land of sand, surfing, tinnies and "No Worries Mate". I had come to the land down under to do an MD, and the game plan was to return to the UK to take up a Specialist Registrar post in Plastics and Reconstruction. I celebrated my thirtieth birthday there, a glass of Chardonnay in my hand, surrounded by some good Aussie friends, with a great career ahead, money, a house, a car - in fact all the things the world tells you will guarantee happiness, when the song by U2 came on, "*I still haven't found what I'm looking for*". "*Is it true?*" joked one of my friends. "*What?*" I asked. "*That you still haven't found what you are looking for*". I laughed, maybe ironically. I dared to have a little reflection on that question. Was there something more than all this ? I was happy, fulfilled and all that but I felt there was something more. What if I never dared to take a risk, maybe in 30 years I would still be listening to the same old song on my sixtieth birthday ? Do you know I didn't fancy wasting my life seeing as it is only one, it is short and you don't get to rewind it at the end. But what to do about it ? I think these questions cross the mind of us all. Sometimes it is tempting not to ask them as the answers can be a bit challenging to find and sometimes the society of today does not provide ready answers. Better to go with the current, to go with the flow or better still, pour another glass of chardonnay and drown these thoughts in alcoholic bonhomie because it's back to work, time to step on life's treadmill again, it's the way it has to be isn't it ?

Whilst on call for Plastics, it became 'normal' to see one or two cut wrists every so often, from young people who were unhappy. I began to question a few things around me. How come that in the land of milk and honey, where the young have "everything" they often lack the most important - the desire to really live life to the full? I remember one boy who came in who had tried to end his life after a bust-up with his girlfriend. He had severed his wrist so severely that he needed 8 hours of reconstructive surgery to try to fix all the cut tendons and nerves. After the long operation through the night we went to visit him. I noticed the unhappiness in his eyes. Maybe he was a bit confused post-op and hadn't realized his operation was finished. "*We fixed your hand*" I said hopefully. He started to cry. "*You should be happy*" I said trying to cheer him up "*We fixed your hand*". He looked straight at me with a piercing gaze that cut right into me "*You fixed my hand, but you didn't fix my life !*" he cried. I was a bit taken aback. I was thinking what an ungrateful person he was after I had stayed up the whole night. What could I do? I had done everything I possibly could hadn't I? What more was I expected to do? Get him a new girlfriend? Well I figured it was just not my problem but you know, something that day changed in me. It was like a voice calling me to give more of myself. Not just my surgical skills or talents but to give my whole life to help. I had always felt up until then that the best way for me to help this world was as a Plastic surgeon but maybe it was to do something else ? At this moment of my life I started to do something that I had never really done much of before, I started to pray. I had listened to many people before about what to do in life but I realised I needed to listen to God.

I had been brought up a Catholic and had gone to Church when I was younger. I had stopped going when I was a medical student because after dancing the Saturday night away into the early hours, I usually only came back to life by Monday, thus missing the Sunday services. I had actually had moments of intense prayer in my life. You know like praying for a new girlfriend, praying for an extension to the overdraft or praying to pass my first year anatomy exams. But now I felt like I needed some slightly deeper guidance. I started to ask God what I should be doing with my life because maybe it was not to be a surgeon. I was thinking of that young man and it was clear to me that it was not only his wrist which was wounded but his heart. But how to heal that? At that time I met some Sisters from the Verbum Dei Catholic Missionaries who were working in Sydney. I was very attracted to the simplicity of their lifestyle and the joy they transmitted to all. Their life was one of prayer, charity and sharing the Gospel. I started to learn more about prayer, to stop for a while, to get off the treadmill, to recharge, in fact to be still in the presence of the Lord.

I don't know if you have ever been in a darkened cinema for a few hours. When you leave and enter daylight it is hard to see but little by little you become accustomed to the light. I started to see more clearly. I asked Jesus what He wanted to do with my life. I assumed He could see things much better than me. How come I was still searching for something ? What was the missing piece of the jigsaw ? How could I help these young people around me who seemed to have lost their way a bit in life? I realised that the voice asking me to give my whole life was Jesus. He didn't want just my talents or surgical skills to help others but He wanted me, all of me. To heal Him, to help many wounded people. There is a moment when Jesus is dying on the cross and He says "*I am thirsty*". The soldiers at the foot of the cross gave him a bit of vinegar to drink. I heard the cry of Jesus today, alive, rising up from the hearts of many people, thirsty for love, for more meaning in life, thirsty for peace, thirsty for a brighter and better world. I began to believe. I realised that I could help to quench His thirst, even with the little vinegar of my life. So I did something crazy. I mean I had done crazy things before in my life, like investing my whole student grant in the College bar, cycling my bike inside Trinity college fountain, writing graffiti on the Berlin wall and all that but I mean something really crazy. Only love can make you do something so crazy. I said "Yes" to Jesus. I said "Yes" to His calling (the only previous callings I had been interested in were for last orders on a Friday night in the student bar). I said "Yes" to his crazy plan to follow Him, wherever, to do whatever He was telling me, to try to be His presence in this world.

I finished my research project, published it and presented it at the Australasian Surgeons Conference in 1999, where I won the Plastic surgery prize, and presented it for the final time at the British Association of Plastic Surgeons meeting in Dublin later the same year. I felt I was bowing out of the world of surgery on a high note, waving au-revoir to a career in Plastic surgery to answer the call of God. I had loved surgery so much but was sure that in answering this calling I was doing the right thing. Not even the pretty Paula could deter me as she inquired "Is their *no-one* who could make you change your mind?" fluttering her eyelashes wildly at me. But I was convinced and so I waved au-revoir to her too and began life as a missionary.

I was sent to the hot, beautiful, exotic, challenging and lively Philippines, to the island of Cebu. There I met 16 other missionaries, from all over the world, teachers, engineers, lawyers, army officers, bankers, from all walks of life. It is reassuring to see so many other young people answering the same calling. Life at first was exciting but challenging. I will never quite forget the shock of seeing rice for breakfast on my first day. I was searching for the crunchy nut cornflakes or at least some sugar puffs but to no avail. Of course I didn't say anything because I wanted to show that I was tough enough for this life in Asia. Then the rice came again at lunch and again at dinner, and then again for breakfast, wave after wave of it. Maybe something in my face gave the game away as my Filipino brothers asked "*Do you eat rice in England?*", "*Yes, of course, but not for every meal*" I replied curtly. My initial fears that I would die of malnutrition proved to be unfounded and little by little my stomach and my heart became more and more Filipino.

The Verbum Dei community was founded in 1963 by Reverend Father Jaime Bonet, and now has 500 missionaries in over 33 countries. We take vows of poverty, chastity and obedience. Poverty is a way of trying to live a more simple life which is necessary for everyone. If you just spend your life chasing after material things then you will always be chasing! It is a bit like the greyhounds that chase after the plastic rabbit, running round and round, but never quite getting their teeth into it. I have found that the less I have the more content I am. It really struck me that in my 5 years in the Philippines, the most generous people were the poor ones. I think the Filipino people would win a gold medal for hospitality if it were an Olympic sport. The only times I remember not receiving a warm welcome were in some of the richer houses! The chastity is to try to live with a pure heart, one that tries not to be selfish. I remember when we all started to go down with diarrhoea and vomiting. We thought it might have been the food until someone mentioned the water tank. When we looked inside we found some dead frogs! When the source was not clean everyone suffered. When we cleaned it up it was able once more to provide life giving water to many people. The obedience is to learn how to be really free. It sounds a bit challenging and it is at times. Like the song by Coldplay when they sing "*Nobody said it was easy*". But anything precious in this life is worth fighting for. For example relationships, friendships, our family, a marriage.

On the medical side, I found the tropical diseases quite challenging. I was trying to take care of the health of the missionaries there and I gradually came to know the gamut of 'tropical' diseases – dengue fever, amoebiasis, typhoid fever etc. Most of these I had only read about vaguely at medical school, thinking that I would never need to know about these strange sounding ailments! Occasionally I had to run the gauntlet with the local charlatans, the "mananambal" (local witch doctors). When our neighbour's son lapsed into a coma I had to convince them that it was not because he had offended the tree spirit by throwing stones at it but it was more likely due to meningitis. On another occasion I became angry at the local healer who had suggested the sacrifice of a pig and a chicken for a man with aplastic anaemia. Of course, in describing these situations I don't want you to think that the health care system is backward or basic, in fact quite the opposite. The Philippines have a good healthcare system, with well trained, highly professional doctors and nurses who can hold their own on any ward around the world, and many hospitals have state of the art equipment. The healthcare is excellent. Excellent that is when you can afford it. The problem is the widespread poverty which means that many lack basic healthcare. At this moment, I would like to ask you a question. Am I allowed? If you are a young medical student, aspiring to help the world, what do you think we can do about this? That over two

thirds of the world lacks basic healthcare. What a challenge! One day I saw a Doctor prescribing antibiotics to a very old man. After the consultation, the old man was crying. He could not afford the antibiotics. I wondered if the doctor had realised this that despite his years of hard studying and dedication to help others, and in the end he hadn't. I have met many doctors, who at the end of the day, are more interested in the health of their bank balance than the health of their patients. There are so many people waiting to be helped in our world of today. I think one life can do so much. Look at Mother Theresa of Calcutta. Everyone, Hindus, Muslims, Sikhs, Christians alike can see what one life moved by love can do for others.

The five years I spent in the Philippines up until July 2004 were really a great adventure. One thing you find is that as a doctor (or even as a medical student) people will ask for your diagnosis or opinion about anything vaguely medical. This is a great privilege and also a great risk. I remember that I was expected to be an expert in all areas from ENT, to Obstetrics and Gynaecology to dentistry. One day when I was in the chapel praying I heard some of the missionaries shouting. "*James*!", "*James*!" "*Quick there is blood everywhere!*" I ran out of the chapel and was shocked to see a trail of blood drops on the ground. I started to go through the ABC of management of penetrating trauma, imagining a brother had been knifed…airway, breathing, circulation…remembering all the emergency techniques I had learnt in America during my month long trauma elective in Washington DC… "*James! Quick he needs an operation!*"…I ran up the stairs at full speed onto the landing to find "Boogie" our dog, being cradled in the hands of one of the missionaries. Boogie, a notorious fighter, had cut the bridge of his nose and it was bleeding profusely. "*James do something, you are the doctor*". Various suggestions were coming forth from my colleagues such as "*Put him to sleep and operate on him*" but seeing that Boogie had already tried to bite 2 missionaries including myself, I felt that he was not really interested in any TLC (tender loving care) we could offer. "*Well Doctor, what do you think ?*" asked my brother. "*I am a doctor not a vet*" I reminded him before advising him that all would be well and Boogie would live. Sure enough the bleeding gradually stopped and Boogie bounded off, ready to fight another day.

Of course as doctors we face situations where you cannot win. Where there seems to be no hope, where you have to fight for someone's life often in the face of difficulties. I used to hate these situations because it can be seen as a failure when the person dies. I think God taught me to see it differently when I was there. One day a young man came to our house bleeding from his nose. He had been diagnosed with aplastic anaemia 3 months earlier but had no money for further medical follow up. His bone marrow was not working and thus was not producing platelets making bleeding likely. At the hospital his haemoglobin was 5g/dL with a platelet count of 15,000. He needed a 5 unit blood transfusion immediately. There was no free blood bank. If you want blood you need to pay for it (for a manual worker one unit is about 15 days' wages) or find donors. We gathered 5 others from 5 different countries to donate and told the 'patient' that his blood would be the united colours of Benetton. We repeated this process every 3 months. The hospital staff asked why we were helping this man as we were not getting paid, he was not a relative and for most of us not even from our own country. I suppose I saw this person as my brother and it moved me to want to help him. I think all of us from Japan, France, Philippines, and Vietnam saw this person as a brother, someone in need, and were trying to be a Good Samaritan in little ways.

His aplastic anaemia proved to be untreatable and he was finally admitted to hospital with platelets of 6,000 and brain haemorrhaging. In his final hours, I really saw how much a person can suffer and I tasted the misery of not feeling able to help, of being overcome by despair, of misery as it seems there is nothing you can do. Even his final medicines, phenytoin to stop him fitting in front of his family, an oxygen mask proved too expensive for us to buy. We had to borrow the money from the doctors. When he was dying I saw the face of Jesus again, a suffering face, "I thirst". A Jesus who suffers but a Jesus who encourages us to keep going, to keep doing good, to not give up. "*Whatever you do to the least of these brothers you do to me*". Many times I think we feel little in front of the challenges of the world of today but I would encourage you all to not give up, keep going. As Mother Theresa said "*It is not how successful I am but how faithful*".

I think one thing I enjoyed was being with the people there. We tried to reach out to many people and share their every day lives. Being with families, students, couples, teenagers. Organizing trips to local orphanages with teenagers, listening to prisoners in the jails, trying to find sponsors for the local children to go to school. For me it was an honour and a privilege to share with the Filipino people and also to live with others who wanted to help others too. I suppose I was lucky growing up in a happy family because many people have not experienced this. I remember one day being at a funeral and seeing a 2 year old child, completely dirty and covered in rags, standing on a table. I recalled the film title "*Angels with dirty faces*". In one instant he slipped and fell, hitting his head off a wall. Soon his face was covered with blood. I approached rapidly and was relieved to find only a small scalp wound. I appealed for some betadine and cotton wool from the enlarging crowd. After initial treatment I asked for his parents. "Where is his mother?" I enquired. "No mother" responded a voice from the crowd. "Where is his father?" I shouted. "No

father!" responded another voice. How sad that this child had no one to care for him, no one to love him. "You are the father!" shouted a small voice from the crowd but to their amusement. Do you know in that moment I realized it was true. That our mission it is not to be a priest, or a doctor or a missionary, as if it is to have a title, or a profession but it is more than that. It is to be like a father I suppose, or a mother to many people.

I hope and pray that each one of us can work hard to help others, to be Good Samaritans in the privileged position of doctors, and also to be doctors with big hearts not just salaries. I am now continuing my missionary life in Rome, doing theological studies. I give thanks to God for the gift of being a missionary and the privilege of being able to take care, in a small way, of the physical and spiritual health of many people.

If you would like to write to me or find out a bit more about our work email me at *jamesmctavishfmvd@yahoo.co.uk*


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Book Reviews

This edition four major texts commonly used in Edinburgh are reviewed by *CHRISTY LAMONT*, our advertising editor, *CATHERINE WEBB*, the Editor, and *EDWARD DUNN*, a RMS council member. Here, WF Ganong's Review of Medical Physiology and Robbins and Cotrans Pathologic Basis of Disease are reviewed

Review of Medical Physiology - Twenty-first Ed.

William F. Ganong
Paperback, 784 pages
Appleton and Lange 2003
ISBN 0071402365
RRP £29.99

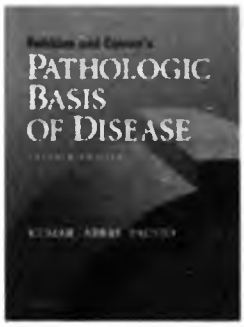
In short this book is "*The Joy of Sex*" of Physiology. Whatever one wants to know about physiology, and whatever someone does not want to know about physiology can be found within the pages of this brilliant tome.

Many a lecturer will stand up in front of their audience and rave about the merits of one huge textbook or another. Thankfully most people are sleeping at the time and therefore save themselves from bad shopping advice. However, some do not. Please, please do not listen to any lecturer when they advise you to buy a physiology textbook unless it is Prof William F Ganong's book. You will not need an endocrinology book, it's covered, you will not need a renal book, it's covered, and you definitely will not need a cardiovascular book, once again it's covered. In a nutshell, this book is all you need to cover the physiology behind medicine. To be honest, if you're not a medic reading this, but a hard working biomedical student, I can say from both personal experience and many, many recommendations, this book will also be more than adequate for you.

Many a medical student has found this to be true. Often medical students in that time of despair and worry more commonly known as revision time, are frantically looking for a book that will tell them what they want to know without any fuss. They also want an information source that is up to date. Most textbooks fall down here. The large physiology texts are not often updated, perhaps once or twice a decade. *Review of Medical Physiology* is different. It is updated every two years by just one man, Prof Ganong himself. It is a testament to him that his book has lasted so long, from the first edition in the swinging sixties to the latest edition in the modern 21st century. Just look up "Ghrelin" – it's there.

The book itself has a refreshingly simple layout. No blinding by snazzy presentation, covering lack of information with pretty pictures. Refreshingly, the publishers have bucked the trend of most, and not insisted on full colour, which unless well done tends to distract rather than aid the reader. The book does not require full colour, all the diagrams are clear enough to more than stand up one their own with just black, white and the red of the general scheme. Chapters progress through the normal physiology on to clinical conditions, with all keywords highlighted when either first mentioned or defined. This makes the use of one of the best features of the book even easier. The index at the back of the book is one of the best seen for a physiology textbook. Absolutely anything you would want to look up will be found, although you may have to know the American spelling of the word.

At the back of the book, a section is dedicated to multiple choice questions based on every chapter of the book. The questions take the general form of true and false statements, which seems to also be the basis of the dreaded Edinburgh MCQs of "the least false false sentence" notoriety. These questions are of invaluable use when revising, and fully test one's knowledge of the topic. Further more, the book also carries a list of the normal values of various body substances as well as a list of the most commonly used abbreviations. ED



Robbins & Cotran Pathologic Basis of Disease - Seventh Ed.

V.Kumar, N.Fausto, A.Abbas
Hardcover, 1552 pages
W.B. Saunders Company 2001
ISBN 0721601871
RRP £56.99

Robbins & Cotran Pathologic Basis of Disease is one of the few weighty tomes that one can actually sit down and read. Once you get beyond that sickly green/ purple colour scheme of the cover, you find a well laid out book that covers the entire spectrum of disease in clear, concise detail. The chapters are broken down into sections that initially present the normal pathology, before delving into the pathophysiology of common diseases of the tissue. The sections are clearly headed and a separate index at the start of each chapter means finding them becomes a doddle.

The book makes a point of allowing a large amount of text to be easily accessible. It starts with the basics and slowly works up to the more complex. This allows you to follow the story with total understanding which makes the oft complex events described clear in one's head. Nearly every page will have histological images that to the untrained eye look just like a collection of colourful patterns. The figure legends, however, manage to make sense of the images which can help one make up for a lack of basic histological knowledge.

This book has an excellent additional feature in the form of a MCQ CD. This is of valuable use when preparing for your exams. PathCAL (see earlier article) may be fine for general learning of the areas but you do get to learn the right answer rather than understand the topic. This CD presents you with cases with associated histological images and asks you detailed questions about the pathology behind the disease. The book is just about worth buying for the CD alone. It really helps your revision of pathology and challenges you to think more deeply about the topic. ED

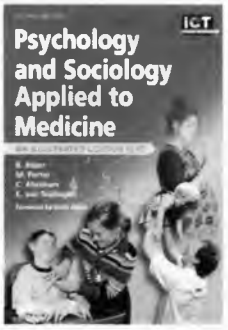
Christy Lamont adds... the online version has all the excellent features of its "real" counterpart – with excellent layout and progression through concepts. One of my problems with Robbins complete edition is that it is huge and very heavy. Not a book to be carted back and forward to the library, or even to be lifted on to your desk (if you can find room for it). The great advantage of the online version is the lack of bulk. It will pop up on your computer screen, complete with all text and pictures.

An added bonus of the online version is the "lightbox" function. This allows you to select diagrams from the text, which the program will then transfer into a printable version, along with space for annotation. One downside of the online version is the fact that the diagrams are often not beside the text which they summarise. There are links within the text to the diagram but these can take a while to load, even on a broadband connection.

One thing to be aware of when using this resource; the search engine often is not very efficient. It seems to have problems recognising words you have searched in the titles of chapters. For example "neoplasia" will only come up in separate references in the text – there is no clue in the search results that neoplasia has in fact a whole detailed chapter devoted to it. In this respect, I would advise mainly ignoring the search engine and going to the old-fashioned index and contents tabs instead.

Book Reviews

The book reviews continue with *CHRISTY LAMONT*'s review of the essential Health and Society text of which Dr Mike Porter of Edinburgh University is one of the authors. *CATHERINE WEBB* reviews the Clinical Skills text by Dr Philip Welsby, always an entertaining lecturer on tropical diseases and a past contributor to the journal



Psychology and Sociology Applied to Medicine - Second Ed.

Michael Porter, et al.
Paperback, 192 pages
Churchill Livingstone 2004
ISBN 0443072957
RRP £21.99

As all present medical students are aware, our education focuses on the "patient centred approach", empathy and communication much more than previous medical courses. We are taught to evaluate the psychosocial influences behind patient behaviour and hopefully become better doctors because of it. The material covered in our course (and by extension "Psychology and Sociology Applied to Medicine") often appears to be common sense. For example, a patient will feel uncomfortable in hospital because of their lack of autonomy. However, because we are being forced to think about these issues, relief from undue stress on patients can be considered. Thus, what is frequently seen by medical students as an extraneous part of our course is one of the most important.

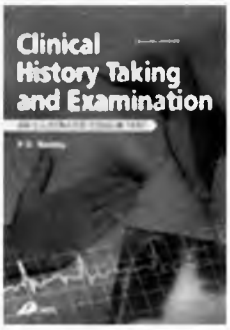
Alder, Porter, Abraham and van Teijlingen's textbook is a succinct explanation of the most interesting and significant aspects of psychosocial behaviour related to medical practice.

Slightly longer than the previous edition, at 192 pages the book is divided up into nine chapters written by an impressive multitude of contributors including Consultant psychologists, public health lecturers, general practitioners, behavioural science experts and MacMillan nurses. These 34 contributors lead to a variety of styles of writing throughout the book. I found it easy to read but occasionally was presented with a daunting page of solid text – not particularly reader friendly. Each chapter comprises of between eight and fourteen topics each covered in a double page spread.

Throughout the text, we find useful diagrams and case studies to consider. These case studies are valuable in placing the information in context of patients and their experiences. Possibly the most convenient feature is the short summary bullet-points which are found on each page. These give concise "take home messages" from each topic.

Additions to the book include information on "quality of life", "media and health" and "social implications of the new genetics". These new aspects of the book are obviously drawn from current research and issues within psychology. With the increasing prevalence of genetic testing and the growing number of diseases which can be detected, doctors of the future will have to be well versed in the psychological implications of genetic testing. The double page spread available in this textbook is comprehensive and pertinent in modern medical practice – useful for both students and those more advanced in medicine.

This book is a must for those Edinburgh medical students who have left revision of health and society to the last minute. For students who have graduated past the pre-exam panic, the book is an excellent summary of all current research into psychosocial aspects of medicine. I would recommend it for gaining insight and empathy towards patients occasionally baffling behaviour. CL



Clinical History Taking & Examination - Second Ed.

Philip D. Welsby
Hardcover, 176 pages
Churchill Livingstone 2002
ISBN 0443070881
RRP £20.99

Behind a classic Churchill Livingstone exterior, Dr Philip Welsby's *Clinical History Taking and Examination* covers one of the broadest areas of medical teaching – the dreaded patient consultation! The first time a medical student is left in a room with a patient, albeit in the company of a colleague, it is difficult to say who suffers the most from the experience. The unwell and unsure patient, or the even more unsure student who is terrified of making the patient worse?

Dr Welsby hits on this point exactly by providing not only the medical information necessary to make a correct diagnosis, but also the skills needed to communicate with the most important people in medicine – the patients. From general principles to special topics, this book takes you through the major systems and back again leaving no stone unturned.

When evaluating this very worthy text, the mind in unavoidably drawn into a comparison with MacLeods *Clinical Examination*[1], another well known Edinburgh book. Dr Welsby freely acknowledges this and with his usual excellent humour tells us that this book is where students should look first – MacLeods and the like can wait till later.

As I prepare for another Clinical Case Study, I too find myself agreeing with this summation. MacLeods is wonderful once you know the basics: what to ask; why to ask it; where to examine; what to look for. However, this book with its concise, logical layout and its useful yellow summary boxes provides consolidation to the clear explanations of what questions to ask and where to look for signs of disease. Each system is broken down into digestible chunks and served to you on a platter with side orders of helpful diagrams, images and pictures. These latter teaching aids are what most distinguish this text from MacLeods, especially for those of us with small amounts of imagination and even less clinical experience.

It is refreshing to be able to read and use a book that has the feel of being written by a human being. Far too many textbooks have any sense of personality surgically removed: making them some of the driest things one can attempt to read. This is a prime factor why so many people are daunted when told to look up facts and figures in a textbook. Dr Welsby has managed to inject (he is a physician after all) some of his humour into his book. This humour has become a trademark amongst students and was on good show in his contribution to the journal in the last edition[2].

Now no longer "Doctor Death" Dr Welsby shines a beacon of light to those finding their feet in the often confusing area of consultations and clinical practice. I recommend this book to anyone navigating their way through the world of medical learning and clinical history taking and examination. CW

1. Munro FA, Campbell IW. *MacLeods Clinical Examination*. 19th Edition, Churchill Livingston **2003**, Edinburgh
2. Welsby PD. Everything you would want to know about contracting a tropical disease. *Res Medica* **268(I)** 2004: 21-22.

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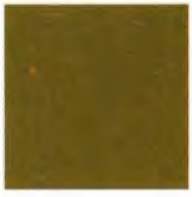

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