The Scottish Society of the History of Medicine

(Founded April, 1948)

REPORT OF PROCEEDINGS

SESSION 1996 - 97 and 1997 - 98

The Scottish Society of the History of Medicine

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THE FORTY EIGHTH ANNUAL GENERAL MEETING

The Forty Eighth Annual General Meeting was held at the Irvine Burns Club, Irvine on 2 November 1996. It was attended by 49 Members or guests and the President Dr H. T. Swan was in the chair. The minutes of the Forty Seventh Meeting were approved and the Treasurer's report was accepted. The membership of the Society was noted as 207. The Office Bearers - Secretary, Treasurer and Minutes Secretary were all re-elected. The retiring Council member, Dr A. R. Butler, was thanked for his contributions and Dr Ernest Jellinek was elected as a new Council member in his stead.

THE ONE HUNDRED AND FORTY SIXTH MEETING

This meeting directly followed the 48th Annual General Meeting in the Irvine Burns Club. The President introduced Dr W. R. Murdoch who talked on Robert Burns – An Ayrshire Lad.

ROBERT BURNS - AN AYRSHIRE LAD

It is fitting that the Scottish Society of the History of Medicine should have decided to hold their meeting in Ayrshire in this the bicentenary year of our national poet's death. I am honoured to speak to you on Burns and would like to highlight certain aspects of his life and to discuss his relations with the medical profession and his illnesses.
William Burness, the poet's father, came from Kincardineshire. He was a devout man, stern, but not always severe, who was interested in education and attentive to his wife and children. He led by precept and example.

> "My father was a farmer upon the Carrick border O
> And carefully he bred me, in decency and order O.
> He bade me act a manly part, though I had ne'er a farthing O,
> For without an honest manly heart, no man is worth regarding O."

Burns' mother was Agnes Brown, a dark eyed farmer's daughter, ten years younger than William. They married in 1757 and lived in harmony and married felicity for the next 26 years. Although Burns' father did much to ensure an adequate education for his children, firstly at the Alloway school and then by a tutor John Murdoch, it was from their mother Agnes that the creative spark was inherited. In her singing, she passed on to him the "Auld Scots Airs", riches in which Robert was to invest a lifelong passion, translating them for us in the vernacular. Emerson said that it was "The only example in history of a language made classic by the genius of a single man."

It was in the Alloway house, reconstructed in 1881 that Robert, the first born, arrived on the 25 January 1759. When he was 28 years old he looked back on his entry into the world and the impact he was to make on it

"Our monarch's hindmost year but one,
Was five and twenty days begun,
Twas then a blast o' Januar win
Blew hansel in on Robin."

His parents had three more children in the Alloway home and were blessed with a further three children later. In an age of high infant mortality, it is remarkable that all the children born to Agnes reached maturity and the family was not broken until 1785 when the youngest son John died at the age of sixteen.

As a young man, Burns knew well those bonds of love, kindness, respect and affection which bind together the family circle and make life sweet in an otherwise hard and unrelenting world. John Murdoch, who taught Robert and his brother, confirmed the happiness within their home "In this mean cottage, I really believe there dwelt a larger portion of content than in any Palace of Europe." The poem "The Cotter's Saturday night" was clearly autobiographical and reflected the working and home life of the Burns family.

William Burness, Burns' father, was ambitious and wishing to advance himself and his family, he took over the lease of Mount Oliphant in 1766. Unfortunately this was a poorly cultivated farm and there was no real return for their work. Luckily he found the larger farm of Lochlea (130 acres) in better condition. Tarbolton was near at hand and here Burns found the social life of which he had been starved at Mount Oliphant. It was here that he joined the Batchelor's Club and took up dancing classes, which upset his father. He also became a freemason. This was important to Burns as it introduced him to powerful and important people such as Gavin Hamilton, the Mauchline lawyer.

Burns was improving as a poet and as a satirist. John Wilson, the schoolmaster, was paid a pittance and augmented his income by selling groceries and drugs from his cottage. Burns made the district rock with laughter with his poem "Death and Dr Hornbrook", describing how Wilson, as Dr Hornbrook, met Death on the road to Willie's Mill. Death had fallen on hard times as a result of Wilson's remedies. John Wilson was a man of some character. He held no grudge against Burns, in fact he asked the poet for a reference when he was applying for a post as a clerk in a law office in Edinburgh, to escape the drudgery of teaching in Tarbolton.

What did the poet, now a man, look like? He was 5ft. 9 ins. tall, although he looked rather shorter, as he had already developed a farmer's stoop. His looks were attractive, although not entirely handsome. His complexion was dark, with flowing locks. A feature was his melancholy eyes, which penetrated the heart of everyone who looked into them.The young Walter Scott was taken to see him in Edinburgh and wrote "The eye was large, of a deep cast and glowed (I say literally glowed) when he spoke with feeling and interest." Mrs Maria Lidell, who knew him later, wrote "His voice alone could improve upon the magic of his eye; sonorous, replete with fine modulation, it captivated the ear and what he had to say was worth listening too.... Mr Burns had an irresistible power of attraction"

With adult life came the early charmers and the marvellous love songs we know so well. Alison Begbie, clearly a girl above average intelligence, who rejected his proposal of marriage, probably inspired Burns to write three love songs, the best being Mary Morrison.

"Yestreen, when to the trembling string,
The dance ga'ed through the lighted ha';
To thee my fancy took its wing.
I sat, but neither heard or saw,
Tho' this was fair and this was braw,
And yon the toast of a' the town,
I sighed and said among them a'
Ye are na Mary Morrison."

It seems likely that Alison's rejection was a reason for Burns' decision to move to Irvine to learn flax dressing and would partly explain his severe depression there.
He and his brother were already growing flax at Lochlea and they would be able to obtain a better return on their crop if they could dress it and spin it themselves. Irvine was the main centre for flax dressing in the county and a busy seaport. Burns lived and worked in the Glasgow Vennel, now restored by the local authority, where the heckling shop was a small thatched cottage.

Burns found flax dressing a dull monotonous task. He became ill with headaches and weakness and attended Dr Fleeming. Unfortunately Burns' partner, a relative named Alexander Peacock, was a scoundrel and due to the carelessness of Peacock's drunken wife, the shop went on fire.

At Lochlea a dispute arose over payment between William Burness and his landlord, which eventually reached the courts. In 1784 William died of consumption and was buried in the old churchyard at Alloway. Burns wrote the inscription, part of which reads

"Here lie the loving Husband's dear remains,
The tender father, and the gen'rous friend"

Gavin Hamilton, the lawyer, came to the rescue and offered the tenancy of the farm at Mossgiel. Burns found the town of Mauchline cheerful and its taverns, clustered around the kirk were jovial.

Burns' time was not entirely devoted to farming. He had to appear before the congregation to be harangued by Daddie Auld. Lizzie Paton, a servant girl was with child. He was counselled against marrying her and the child was taken into the family and reared by old Mrs Burness. He was also courting Mary Campbell or Highland Mary, in a most ardent way, meeting on the banks of the Ayr, commemorated today by a monument at Failford. Tradition has it that they exchanged bibles that day as a form of marriage, although Burns' bible has not been found. Certainly Mary's bible can be seen at Burns' Monument. Apparently she was to accompany him to the West Indies. The song "The Highland Lassie O" shows that he was seriously involved. Unfortunately Mary died at Greenock, but there is no real evidence that she was pregnant.

The publication of his poems however led to his fame. He decided to stay and to marry Jean Armour, who was also pregnant. They set up house at Mauchline. Undoubtedly Jean was the supreme love of his life. She made him a comfortable home, gave him children and was never jealous of his writing or of his association with the rich and influential. Above all, she was understanding when he erred from the path of virtue. Later when Robert was in Dumfries, he seduced Anna Park, barmaid at the Globe Inn, with the usual results. She died in childbirth and Jean took the baby into her home and reared her as her own child. He wrote of Jean

"O' a' the airts the wind can blaw
I dearly like the West,
For there the bonny lassie lives
The lassie I loe' best."

Burns has been presented as being a libertine. Perhaps he sinned no more than his contemporaries, but was more unlucky in being found out. He had his weaknesses and this gave him added sympathy for those who fell by the wayside.

"Then gently scan your fellow man,
Still gentler sister woman.
Though they may gang a kennin wrang,
To step aside is human."

The latter part of Burns' life was spent in the Dumfries area, initially at Ellisland Farm and later in Dumfries, where he carried out Customs and Excise duties. As an exciseman he was a conscientious government servant, but he maintained his own divergent views and although now famous, he never forgot the underdog or the underprivileged.

In July 1796, he became terminally ill. His wife Jean was expecting another child and could not nurse him, so Jessie Lewers, a sister of Burns' excise colleague, came to look after him. One day he told her that if she would play her favourite air, he would write a song for it. She played a 17 Century tune "Lenox Love to Blantyre" several times until the poet was familiar with it and very soon he wrote

"O wert thou in the cauld blast,
On yonder lea, on yonder lea;
My plaidie to the angry airt,
I'd shelter thee, I'd shelter thee.
Or did Misfortune's bitter storms
Around thee blaw, around thee blaw,
Thy bield should be my bosom,
To share it a', to share it a!"

This was the last great lyric that he wrote. He died on 22 July 1796.

Turning now to the contacts that Burns had with doctors during his life, some were social and some were as a patient. When he came down from Kincardineshire to Ayr, the poet's father William Burness, leased seven and a half acres from **Dr Alexander Campbell.** At this stage William Burness had hoped to establish himself as a market gardener. He laid out his land and began to build a cottage. **Dr William Ferguson** was a London doctor who had amassed a fortune and had recently retired to his native land. He rebuilt and added to the estate at Doonholm relying heavily on William as his gardener. Dr Ferguson later became the Provost of Ayr. He was a generous master and helped out the Burns family on several occasions. **Dr John McKenzie,** the Mauchline surgeon, was William Burness' physician on his deathbed. He was impressed by Burns and later became his friend and fellow mason. He had sufficient influence to help Burns by introducing him to potential patrons. He took him to dine with Professor Dugald Stewart, whose other guest was Lord Daer, an occasion celebrated by Burns in verse. McKenzie also introduced

Burns to Whitefoord, Henry Erskine and Blair, all of whom became his patrons in the Edinburgh set. McKenzie left Mauchline to practise in Irvine and eventually became MD Glasgow in 1824. **Dr John Hamilton,** then a medical student and the son of Provost Hamilton, befriended the poet in Irvine. He later helped him with the Kilmarnock edition.

Dr Charles Fleeming treated the poet when he was in Irvine. His day book still exists, having been discovered in the attic of his former house in 49 Kirkgate. It covers the period from 1757 to 1798. In November 1781 Fleeming visited Robert Burns, lint dresser, five times in the space of eight days. On 14 November, ipecacuanha and "sacred elixir", a powerful elixir of rhubarb and aloes was given. Thus severe depression was treated with vomiting and purging to clear the black bile. On the 19 he was given an anodyne. On 20, 21 and 22 November he received massive doses of Cinchona bark which contains Quinine. This was the standard treatment for fever.

Dr John Moore was a friend of Burns' patron, Mrs Dunlop and the son of Rev Charles Moore of Stirling. He was educated at the University of Glasgow and served in the army as an assistant surgeon in the Coldstream Guards. In 1770 he became MD Glasgow and thereafter took a dilettante role in medicine and a greater role in literature. He travelled on the continent with the Duke of Hamilton for 8 years and wrote books on his travels plus three novels. His eldest surviving son was Sir John Moore, the hero of Corunna. He tried to persuade Burns to write in English, but fortunately he failed. The most important letter which Burns wrote to him is that in August 1787 in which the poet gives his history and is the basis of subsequent biographies of Burns.

Dr James Gregory and Burns met at Lord Monboddo's hospitable table and their friendship ripened. He attended the poet for his sprained ankle. He was a member of a distinguished family which produced sixteen professors in five generations. Best known for his powder, he succeeded Cullen to the chair of Medicine. **Lang Sandy Wood** was a famous Edinburgh surgeon who raised the standard of surgery at Edinburgh Royal Infirmary. He attended the poet when he fell from a coach, partly dislocating a kneecap which Wood managed to set in position again.

James Mckittrick Adair accompanied Burns on his Harvieston tour of 1787. He studied at Geneva and graduated at Edinburgh. He married Gavin Hamilton's half sister. **Dr Robert Watt** was a member of the Faculty of Physicians and Surgeons of Glasgow who practised in Edinburgh and Harrogate. As a youth he worked on the roads in Dumfriesshire and lodged in the old farm house at Ellisland. He borrowed books from the poet, who may have inspired him in his library career which finished with the Bibliotheca Britannica. **Dr William Maxwell** was the second son of James Maxwell of Kirconnel and studied medicine at Dinant. He became a republican and is said to have dipped his handkerchief in Louis XVI's blood at the guillotine. He returned to Dumfries in 1794 and with Burns and Syme, led the liberal party in Dumfries. The poet's doctor and companion, he treated him according to the knowledge of the day, using mercury and sea bathing. Burns' youngest son, born on the day of his father's death, was named Maxwell.

Dr James Currie was the poet's biographer. He took no fee but managed to make £1400 for his wife and children. He met Burns once, briefly. As an editor his motives were pure. He was a teetotaller, a liberal and high minded character who tended to alter the facts to suit his theories. He had no experience of editorship and made many errors. He accused Burns of profligacy and alcoholism. After an unsuccessful career as a merchant in America, he returned to Scotland and studied medicine in Edinburgh,

graduating in 1780. He settled in practice in Liverpool and did so well that he was able to purchase an estate in Dumfriesshire.

When Burns' **illnesses** are considered there are, of course, difficulties of diagnosis. Burns died in 1796, two centuries ago. We cannot now obtain any further scientific evidence. His doctors did not possess a stethoscope or a clinical thermometer. Pitcairn and Jenner made reference to rheumatism as a cause of cardiac disease in 1788 and 1799 respectively, but the first publication was not made until 1812 in Britain and 1835 in France. Brucellosis was first described by Marston in 1861 and the organisms were identified by Sir David Bruce in 1887.

Psychosomatic Illnesses. Robert inherited a melancholy nature from his father. There are many reports of depression, often associated with bad news, and accompanied by headaches and faintness. That he felt ill in Irvine is confirmed by Dr Fleeming's day book. He had been rejected by Alison Begbie and his father was in considerable debt at the farm, to the tune of £500.

Rheumatism and heart strain. Robert and his brother Gilbert were overworked. There were several episodes of joint pains and from 1794 until his death he had episodes of "flying gout" affecting the large joints. At times he had tachycardia and irregular heart beats, but whether associated with rheumatic heart disease or psychosomatic illness is not clear.

Fever and colds. These would be expected in a man working out doors and in inclement weather. Much is made of an incident when he left the Globe Inn at 3 am to return home on a very cold morning numbed and intoxicated. This was followed by an attack of rheumatism which confined him to bed for a week. However weather records at Dumfries show that there was no snow at all in Dumfries and only a light frost in January and February 1796. There is also some doubt as to whether he was out that evening.

Toothache and quinsy. Burns had quinsy in late September and early in 1790. The history of toothache is well documented.

Injuries and fractures. During his Edinburgh period in December 1787 he fell from a coach due to a drunken driver's carelessness. No bones were broken, but the kneecap was dislocated and as mentioned, Sandy Wood was able to reset it. A year later he was still complaining of pain in that knee. In January 1791 he fell from a horse and fractured his arm, which made writing difficult.

Mercury and lead poisoning. Dr John Thompson, at the time of the Burns' Festival in 1844, suggested that Robert's death might have been hastened by Dr Maxwell who prescribed mercury for liver disease and sea bathing. Buchanan and Kean concluded that mercury might have been an added insult to an already damaged kidney, and could have precipitated the terminal event of uraemia and renal failure. In 1971, Professor John Lenihan and his colleagues at the Department of Clinical Physics and Bio-engineering in Glasgow were able to examine a small sample of Burns' hair by neutron activation analysis. The mercury content was 8.02 parts per million, twice the normal, but much less than is found in dentists and laboratory workers. Human hair grows slowly and the mercury content found could have reflected a dose given previously rather than one taken at the time of his fatal illness. Lead oxide was sometimes added to inferior wines to prevent them turning to vinegar, but Lenihan and colleagues found no trace of lead in the hair sample.

Alcoholism. There is a popular myth that Robert's early death at the age of 37 years resulted from alcoholism. Thus Heron, Currie, Carlyle, Lockhart and Cunningham all believed that he drank himself to death. None of these early biographers had a close

knowledge of their subject. I have already discussed Dr James Currie. Although an admirer of the poet's verse and a friend and supporter of the family, he was hopelessly biased as strict teetotaller. Nevertheless his official position and the respect with which he was held in the community lent credence to his views. There is no doubt from his letters that Burns was at times intoxicated, but hard drinking was a feature of society at that time and Burns was aware of its deleterious effects. However all recent biographers who have researched the evidence conclude that Burns can in no way be considered as a chronic alcoholic. James Gray, who was an ordained minister and rector of Dumfries Academy was the first to suggest that if the poet had been a chronic alcoholic he could hardly have written the number of songs that he did in the last years of his life. He had personally noted the hours Burns had spent in tutoring his eldest son in the English poets. Alexander Findlater, who was Burns' supervisor in the excise, testified to the poet's good character, as did Gilbert the poet's brother in his letter to Peterkin. The strongest support came from Maria Riddell, who although estranged from the poet in the last years of his life was happy to testify to his moral character in the Dumfries Journal.

Venereal Disease. Although he frequently committed adultery after his marriage, there is no real evidence to suggest that he suffered from gonorrhoea or syphilis. His wife, Jean Armour remained in good health and none of his surviving offspring showed any evidence of syphilis.

Bacterial endocarditis. Buchanan and Kean give an excellent analysis of the poet's final illness. There is no definite history in keeping with acute rheumatic fever in childhood, but that does not of course exclude the diagnosis. There are many descriptions of joint pains and the "flying gout" is described. The poet wrote of rheumatic fever but this may not be the clinical entity that we know today. Robert certainly had toothache, he wrote an "Address to the Toothache" and on two occasions had quinsy. A streptococcal cause seems likely. There were episodes of tachycardia, but some of these may have been psychosomatic in origin. His terminal condition was characterised by extreme weakness and ended in coma. Crichton-Browne, Anderson and Buchanan and Kean conclude that death was due to bacterial endocarditis complicating chronic rheumatic heart disease and I would certainly agree.

Brucellosis. Buchanan and Kean and Fowler have suggested brucellosis as a possible cause of death. Burns kept a cow and sheep including a pet ewe. Before the antibiotic era, brucellosis was a cause of death and was associated with fever and joint pain. Although his father and brother died of tuberculosis, there was no evidence of it in the poet. In this modern era lymphoma and leukaemia would obviously feature in the differential diagnosis.

In his epistle to John Lapraik, a farmer bard, Burns wrote

"Gie me a spark o' nature's fire,
that's a' the learning I desire,
Then tho' I drudge thro' dub and mire
At plough or cart,
My muse, tho' homely in attire,
May touch the heart."

Burns says clearly what every Scot feels. He reminds us of our best qualities and of the importance of the brotherhood of man. "The hearts aye, the parts aye, that makes us right or wrong." His charm has persisted over the years. We ourselves, though denied the

privilege of meeting him face to face, still feel the attraction of his vivid personality speaking to us through the pages of his prose and verse and we know that our children and our children's children will feel it after us.

In genius, in humour and in satire Burns was equally great. Although education played some part in the formation of his character, what he wrote was the pure offspring of native genius and when we reflect how excellent he was in all, what various powers of poetical delineation he has shown, then we may safely place him side by side with the greatest names our country has produced.

Dr Murdoch's paper was followed by one entitled "The Phrenologists and Robert Burns" by Dr Mark Fraser.

Dr Fraser pointed out that Burns' widow survived her husband by 37 years. When she became terminally ill in 1834 and the crypt was soon to be opened, plans were made to obtain a plaster cast of the poet's skull for phrenological study. In secrecy by night a party of Dumfries men, led by John McDiarmid, a local editor, dug up the skull and borrowed it overnight. McDiarmid's writings and letters make clear the circumstances, and it is possible to identify by name eleven men who were present. Three original casts were made (many copies became available in later years, while belief in phrenology survived) and it is probable that one of these originals is in the Writer's Museum in Edinburgh – Lady Stair's House.

Dr Fraser's paper has been published in full in the Burns Chronicle, the Bicentenary Edition of 1996, at pages 215-221.

THE ONE HUNDRED AND FORTY SEVENTH ORDINARY MEETING

The One Hundred and Forty Seventh Ordinary Meeting was held in the Royal College of Physicians and Surgeons of Glasgow on 22nd March 1997. Before the meeting some 54 members and guests were able to see an exhibition of original artwork prepared for "Gray's Anatomy", arranged by Ms Julia Merrick with the approval of the College authorities.

After lunch, two excellent papers were read, one by Professor IAD Bouchier of Edinburgh University on "The Rise of British Hepatology", and the other by Dr Robert Arnott of the School of Antiquity, Birmingham University on "Before Chiron-Healing in the Prehistoric Aegean".

Both speakers were well received, prompting questions and interesting discussion.

THE SIXTH HALDANE TAIT LECTURE

The Sixth Haldane Tait Lecture was held on Thursday 8th May 1997 at the Pollock Halls, University of Edinburgh. Before an audience of some 55 members and guests, Professor Vivian Nutton of the Wellcome Institute, London delivered an erudite and scholarly address on the subject of medical forecasting in antiquity and now.

MEDICAL FORECASTING IN CLASSICAL ANTIQUITY AND NOW THE SAME OR DIFFERENT?

"Am I going to get well?", "Shall I recover?", must be among the most common questions asked of a doctor; they are certainly among the oldest recorded. Egyptian papyri and even potsherds bear roughly scratched questions to the gods from sufferers wishing to hear the answer. In the second century of the Christian era inscriptions on stone tell how the oracle of Apollo at Claros in Asia Minor received numerous processions of suppliants, some sent by wealthy towns, headed by the mayor and the equivalent of the town band, others composed of individuals, but all alike wishing to know when their disease or when an outbreak of plague might come to and end. At another shrine, at Abonuteichos on the Black Sea coast of modern Turkey, the priest handed out his god's responses on slips that could then be nailed above the lintel of the door to ward off any future attack of the plague.

I begin with these examples as a reminder that it was not only doctors and the family who might be concerned with a patient's future, as well as to note that many sufferers would have found no difficulty in combining a religious and a medical approach to their disease. The councillors who came to Claros to seek help from Apollo were precisely the same people who would have been concerned in choosing a physician to reside in their town to fight the plague. A close link between the prophecies of the god Asclepius and medical forecasting was openly acknowledged by Galen in his commentary on the Hippocratic Oath when he declared that Asclepius as son of Apollo had inherited the ability to foretell the future. The laurel wreath that Asclepius wore betokened the prophet and diviner as much as it did the doctor; and the keen-eyed snake, the demigod's companion, served as a representation to the supreme importance of observation and foresight. Galen, as so often, is not alone in this belief, although, as we shall see, he attempts to assert a specifically medical, or rather, a specifically Hippocratic form of foresight, prognosis.

Prognosis has often been regarded as one of the great achievements of Greek medicine, especially for bringing the future under the oversight, if not the control, of the doctor. It is, as James Longrigg has recently reminded us, pre-eminently rational; I make no mantic prophecy, begins the author of the Hippocratic treatise *Foretelling (Prorrhetic)*, Book 2, and historians have concurred. But one should not forget that Babylonian doctors too claimed to be able to predict the future outcome of disease, and that they were well aware that both their forecasts and their techniques were made in a manner different from and independent of those of the healing seer. They too viewed certain physical symptoms as decisive, and they appreciated that their appearance was likely to end in death or recovery. Take this description of epilepsy, which shows neatly the link between observation, diagnosis, and prediction.

If at the time of his possession, while the patient is sitting down, his left eye moves to the side, a lip puckers, saliva flows from his mouth, and his hand, leg, and trunk on the left side jerk like a slaughtered sheep, it is *migtu* (a general word for epileptiform convulsions). If at the time of possession, his mind is awake, the demon can be driven out; if at the time of his possession his mind is not so awake, the demon cannot be driven out. This Babylonian document, copied onto a tablet around 650 B.C., two hundred years before our Greek Hippocratic Corpus, shows what is always an essential (and sometimes the sole) element in medical forecasting; the question whether the patient has any chance

of getting better or not. It is a question posed by both orthodox and unorthodox practitioners alike, and by the patient, his friends and his family. More than one respectable Greek medical authority declared that the distinction between the good doctor and the less good lay precisely in their ability to distinguish the curable from the incurable - with the implication that a refusal to treat an incurable illness carried no reproach at all, indeed, rather the reverse. It is a practice not confined to those whom we might wish to see as physicians. Artemidorus of Daldis, the author of a dream book that is fascinating in its picture of social life in Galen's own time and region, carefully lays down the meaning of dreams, saying which portend death and which recovery. One can turn to the astrological treatises of Hephaestion or Vettius Valens, written at about the same time, and read there how the doctor can find guidance on how to compute the stars so as to discover whether a patient will live or die. Galen, and many of the Hippocratic writers, objected both to this simplistic interpretation of dreams and to the notion that the stars determined one's life or death, but they, I suspect, were fighting a losing battle. Certainly, there were very successful doctors whose expertise lay in astrological computation, like Dr Crinas of Marseilles, who came to prominence in the time of Nero with his claims to regulate the diet of patients by the motions of the stars according to astronomical handbooks. His financial success was enormous: an estate worth 10 million sestertii, double that in pounds, even after he had paid for the rebuilding of the walls of his native city, and for the construction of other public buildings there. Another doctor, Lucius Fonteius Fortis Asclepiades, a doctor from Ephesus who settled in Rome, was so proud of his expertise in star lore that he remarked on his tomb that he had lived for exactly 40 years, 25 days, and 7 hours, just as predicted. On another occasion Galen reports overhearing an argument between two diviners over the meaning of the flight of birds; one, who followed the Egyptian method, declared that a bird flying from left to right when one examined the sick was a good sign; the other, relying on Greek tradition, held the opposite view. Galen, of course, while noting their learning, thought it all worthless. The flight of birds or the computations of the stars revealed absolutely nothing about the fate of the sick. At best they might indicate changes in the overall weather pattern, and it was climate, not birds or constellations, that affected the body for good or ill. As for those who played numbers games, or who calculated the survival of the patient by giving each letter of his name a numerical value and then hunting for lucky sevens, Galen held them in deep contempt. "Why seven?", he scoffed, "and if the presence of the number seven is so significant, why not invoke seven-gated Thebes or the seven mouths of the Nile alongside doses and ingredients listed in sevens?" Galen's polemic, splendid in its rhetoric and so congenial to our own ideas of medicine, may not have had the effect we sometimes imagine. It is not just in Alexandria that every back alley was said to house its own doctor, priest and diviner. After all, it was not until the mid-sixteenth century that medical astrology lost respectability among learned physicians, although not with patients; and for several centuries before then the most potent diagnostic weapon in the doctor's armoury was his ability to compute the heavens, a skill that demanded a substantial acquaintance with mathematics. Charts laying out the phases of the moon, and the positions of the zodiac, were carried by medieval doctors to the bedside of the sick, and in many of their small travelling packs, the first illustration depicted the parts of the body with the constellations that most determined whether they would be healthy or ill. Even within the Galenic Corpus, there is a small tract *"On prognostics,"* written perhaps not much later than Galen's day, and no later than 300 A.D., which is designed to show how one might obtain the most effective and most accurate prognosis. One does this by calculating the heavens at the

moment that the patient first took to his bed, and, in doing so, one is following the authority of the ancients, of Diocles of Carystos in the fourth century B.C., and ultimately of Hippocrates before him. The author's argument and his history are far from convincing to a modern scholar, but instructive nonetheless. Hippocrates favoured prognosis, true. He also believed that without an understanding of physiognomy the doctor would be left in the dark. This is less true, for the quotation in Hippocratic Greek that is claimed to go back to the Father of medicine cannot be found in our present Corpus, and most scholars assume that it is a more recent invention, perhaps even by the author of *On prognostics* himself. But such a conclusion might be justified from the ending of *Epidemics,* Book 2, the last two sections of which are headed in some manuscripts "Physiognomy", and list a series of somewhat puzzling facial signs. Pseudo-Galen goes on as follows; "physiognomy is the most significant part of astrology, and if you believe in the value of physiognomy, you must, ipso facto, believe in the value of astrology. Therefore Hippocrates supported astrological medicine." Both the logic and the historicity of this claim would have roused Galen to fury, and it is ironic that this treatise was transmitted for centuries as part of the Galenic corpus, and helped to give the impression of Galen as supreme in astrological understanding, as well as in more down-to-earth diagnosis. But there is a notorious passage in Galen that might seem to offer some support for the view that even Galen was sympathetic to that sort of astrological forecasting. The third book of *On critical days* is directed to showing how the moon and the position of the stars and constellations affect the critical days of the Hippocratic physicians, days that were particularly significant in the progress of an illness. Galen declares that they marked a proposition that was well-based in experience, and for which Egyptian astronomers were to be congratulated. It is, in part, the position of the moon that determines how critical a critical day is going to be, and Galen shows himself perfectly familiar with the technicalities of contemporary astrology, its decans, secants, and houses. True, he explains that the astrologers justify these results in their own terms of horoscopes and conjunctions whereas he, of course, sets all these calculation within a broader framework of climatology. Numbers, of themselves, tell us nothing about causes, and they do not of themselves change the body; that is the consequence of changes in the heavens brought about by the relationship of moon and stars. Hence the need for the doctor to familiarise himself with astronomical (and even astrological) data. But the care which Galen shows to mark off his own expertise from that of the astrologers also confirms at the same time that there were those who preferred simply to follow astrology. This beginning to a study of medical forecasting in Antiquity may seem shocking to those brought up to see the Hippocratic tradition as dominant in Greece and Rome, but it serves to make two points. The first is that Galen should never be trusted entirely in what he says; and, secondly, that the medical world of Antiquity was far more varied than historians have been wont to declare. Just because modern physicians have followed Galen, on the whole, in reconstructing the ancient past, just because we have come to see the Hippocratic tradition as both the dominant and the most effective tradition within ancient medical practice, just because over the centuries dissenting voices have gradually become silent, that is no reason either to neglect this alternative form of medicine or to believe that it disappeared because it was unreliable and, in patients' eyes, ineffective. It does not take much effort in reading the medical texts of Antiquity to see that Hippocratic medicine was far from monolithic and far from supreme, or that Galen's view of his own career, as a man of genius opposed, even oppressed, by a variety of competitors, may not be as wide of the mark as some have thought. The Hippocratic author of *Forecasting*. 2, in dissenting from 'mantic prophecies',

gives a series of examples of cases in which doctors or healers gained a substantial reputation by following those procedures. I began by describing forecasting as an answer to a crucial question, will I live or will I die? Questions about the beginning of life were almost as common, - shall I conceive? will my child be a boy or a girl - or even twins ? - and doctors were equally involved in providing the answers. Egyptian papyri from 1100 B.C. onwards record a series of tests to decide whether a woman will conceive, some of which have parallels in the Hippocratic Corpus. Apply an onion bulb or a clove of garlic to the vulva overnight; if, in the morning, the woman's mouth smells of onions or garlic, she will conceive and give birth. For forecasting the sex of the child, a pseudo-Galenic text preserved along with Galen's drug books offers a swifter and allegedly incontrovertible procedure. Drop parsley onto the head of an unsuspecting woman, and note the first word she utters; if it is masculine, it will be a boy; if feminine, a girl. But one might rightly say that this is not what medical forecasting is about; that what the astrologers or the garlic fanciers, the dream merchants or the parsley planters are doing is setting up a series of tests that will provide simple ways of predicting the eventual outcome. They are answering the question, but they are not helping, indeed cannot, help to bring that answer about. The patients may be satisfied that they will recover, and for that reason may more easily entrust themselves to the tender mercies of a medical man, confident that the outcome is already determined. But that blunt forecast does not assist the doctor in selecting an appropriate treatment. But such a procedure is not always necessary, even today; what the patient wants is to know of his or her recovery, and considerations of how long that will take are secondary. Once assured of recovery, the patient will happily accept whatever the G.P. or consultant prescribes, and it is the assurance of future recovery that matters in the first instance in gaining the patient's faith and co-operation. But Galen, appealing to Hippocrates, would have rejected this as simplistic, and as underestimating the potentiality of prognosis, and it is Galen's view that has prevailed among doctors today. In his opinion, a true prognosis was more than a simple yes or no answer; it was a means of forecasting, and thereby also regulating, the whole course of a disease. It included both what we would understand as diagnosis, discovering the cause of an illness, and prognosis as a description of future events; it was, he claimed, the science of past, present and future. It was also, along with anatomy, one of his major claims to success; and he reports with approval the gasps of admiration and amazement that greeted some of his successful forecasts. He himself vigorously rejected the appellation given him by others of 'wizard', prophet, wonderworker, miracle-healer, and the like, for these were terms that carried with them the taint of illegality or of quackery, and because, in his opinion, he was doing nothing special, nothing novel. Nonetheless, others might have been proud to have been so-called - at the town of Velia in S. Italy one inscription records a 'medical prophet', 'iatromantis'; and Galen himself does not shrink from the reputation that these prognostic cures brought him. Time and again he insists that he is merely reviving the procedure of Hippocrates, one long forgotten, and one that any one who wishes can follow; but time and again Galen's case histories reveal the sophisticated way in which he made as much as possible out of these allegedly simple procedures. His reputation in Rome was gained by the prognoses he made for his old teacher Eudemus; and, in another famous case, he predicted the death of the intellectual Theagenes if he chose to follow the advice of his Methodist doctor, Statilius Attalus, his colleague in the imperial palace. The consequent death of Theagenes was almost stage-managed by Galen to discredit his competitors. One might also recall that for Galen to allege that his opponents neglected something extremely simple was to offer a double insult: they were intellectually ignorant and, at the same

time, incapable of performing even a basic procedure, in the case of Theagenes, the result of this ignorance was unmistakable on the funeral bier. But what was Galenic prognosis? How far was it Hippocratic? How far was Galen right to claim that it had been ignored for centuries? And how was that prognosis to be achieved? The rest of this paper is an attempt to answer these medical questions briefly. I have already said that for Galen this prognosis encompassed both diagnosis and prognosis; it was concerned with defining the patient's condition of illness, determining its cause, and controlling its future course. Forewarned and forearmed, the doctor would not only be able to predict how a disease might be expected to develop, but also to know when and how best to intervene, the consequences of that intervention, and the range of symptoms that would appear at the various stages of treatment. By contrast with the simpler forecasting described earlier, this Galenic prognosis might be extremely detailed, and it was comprehensive in its range. It was to be a guide to all stages of the illness, and was to resolve a whole series of medical questions, expected as well as unexpected. In one famous story, in *On affected parts.* Book 5, Galen felt able to tell his patient not only what his condition was and how it was best to be cured, but also what symptoms the patient felt, and what he, the patient, believed to be the cause of his ailment. Such forecasting was also, if made correctly, infallible, solid, certain, secure - adjectives favoured by Galen to substantiate his case - and, of course, in Galen's eyes it had the merit of going back to Hippocrates and to Plato. But did it go back to the fifth century B.C.? Certainly the logical procedures that made up Galen's method of differential diagnosis were commended by Plato, who also ascribed them to the historical Hippocrates, and Galen pointed frequently to the importance of the treatise *Prognostics* in our Hippocratic Corpus. It was from this text that he took the idea of prognosis as something embracing both past, present and future, as well as its crucial significance for the doctor in gaining the patient's confidence. He could also explain many of the highly abbreviated notices gathered by the author of *Epidemics.* Books I and 3, whom Galen, and many other scholars, took to have been Hippocrates, as serving as prognostic memoranda, things observed and selected to indicate the future course of diseases. There were also treatises, admittedly less familiar, devoted to *Prorrhetic,* foretelling, and even a summary of medical forecasting, with obvious links with Hippocrates, that was called *Coan prognoses.* There were also scattered through the Hippocratic Corpus, e.g. in *Aphorisms* and in *On teething*, sentences and phrases that Galen took to indicate that a particular symptom or series of symptoms was signalled out as particularly significant in predicting the course of a disease. But we must make one important qualification to Galen's belief in Hippocratic prognosis: the texts in the Corpus emphasise the outcome of a particular symptom or symptoms; whether death is likely or unlikely; where an abscess is going to improve or get worse; or where the addition of another bad symptom is going to indicate a fatal outcome. So, for example, pains with fever in the loins and lower limbs are bad, but not fatal; if the pain moves to the diaphragm, the case is hopeless - except if other symptoms arise as well, which indicates that empyema will occur, which may be a good thing. Even in *Coan prognoses* there is no sense of the all-embracing nature of prognosis as defined by Galen. Besides, the very meaning of the Hippocratic word prognosis was open to question, especially as there was another and apparently similar word *prorrhesis* present in other texts in the Corpus. How to reconcile the two was a matter of considerable scholarly ingenuity. For the great Alexandrian physician Herophilos around 280 B.C., the difference lay in the quality of the knowledge that was implied: prognosis, foreknowledge, indicated certainty, prorrhesis, prediction, something less certain. Others had different ideas: some saw the foreknowledge as based

in the physician, prediction as based in the patient. The doctor knows in advance, the patient tells the doctor what he merely thinks will happen. Alternatively, prognosis was when one knows but does not say what is happening, prorrhesis when the forecast is actually mentioned. Others stressed the difference between gaining the knowledge, and actually expressing it correctly and wisely. None, as far as I know, argued that the words overlapped, and might be used by different authors to indicate the same thing, and none of the earlier interpreters, as far as I can tell, interpreted prognosis, when they used the term, in the wide-sweeping sense that Galen gave it. This helps us to understand Galen's claim that prognosis was, in his day, a neglected and almost forgotten art. Of the medical sects who flourished in his day, one can be sure that neither the Empiricists nor the Methodists would have agreed with Galen's view of the importance of prognosis. For the Empiricists, who rejected any notion of investigating the cause of a disease, what mattered was therapy; choosing the right treatment on the grounds of the similarity of a patient's condition to one that had been successfully treated before. Prognosis is, at best, acknowledged in a very limited sense; a disease may be forecast as likely to be cured or not because that is what has happened in the past in a similar case. Prognostic signs do indicate a general tendency, and they are valuable in treating an individual case, but it is precisely the relationship between the general and the individual that is hardest to define.

By contrast, the Methodists, Galen's strongest opponents, had no need of Hippocratic prognosis, except for public relations. They saw a swift and easy correlation between visible signs, their cause and their treatment; and they were prepared to modify their therapy as the cure progressed in accordance with the signs and symptoms that they saw. They rejected the notion of a fixed path for the disease or for its treatment; they refused to treat disease, as Galen did, with an eye to eliminating the cause or causes of a patient's illness as if that was a prescription fixed and unchangeable once given. They prided themselves on their ability to respond immediately to visible changes in the patient, modifying treatment as it progressed until the patient was cured. They found ludicrous the idea that the course of a disease and of its therapy could be predicted so accurately by the physician that any deviation must be the fault of the patient or of circumstances outside the doctor's control.

Five hundred years earlier, one of the writers in the Hippocratic Corpus expressed a similar scepticism about the doctor's ability to forecast the future. The author of *On diseases* was prepared to accept that in certain situations, e.g. in cases of wounding, it would be possible to tell whether the patient was likely to recover or not, but in general this was impossible. Knowing what the course of a disease was likely to be in theory was of little value in actual treatment, for the individual's reactions and behaviour were so unpredictable that the safest way of proceeding was to treat each instance of a disease as if it were just that; an individual case, to be treated symptomatically.

This scepticism may well have been shared by most of the writers in the Hippocratic Corpus. Certainly, the majority of treatises spend little time on prognosis, even when they choose to mention it, and, at best, forecasting is implicit, rather than explicit. Later Hippocratics, while talking of prognosis, do not give it the importance assigned to it by Galen. Rufus of Ephesus, who lived about a hundred years before Galen, and whose treatise *Medical Questions* is a remarkable essay in bedside diagnosis, speaks about prognosis, but only rarely, and when he does, he also uses the word prorrhesis interchangeably with prognosis. He also harks back to the older use of prognosis as a way of deciding whether a disease is curable or not: knowledge of the patient's habits, for example, allows one to 'distinguish congenital from acquired disease, the former being

harder to cure than the latter.' Prognosis is the gathering of information of all sorts before proceeding to therapy, not the sure and secure guide favoured by Galen. It would be going too far, perhaps, to say that in his use of prognosis to determine curability, Rufus was reverting to that older approach characterised by Ludwig Edelstein as 'an insurance policy for doctors'. In a famous article, now sixty years old, that German scholar argued that prognosis before Galen served a social, rather than a medical purpose. It protected the doctor in three ways: first, by giving the doctor knowledge of the past, it allowed him to distinguish the true story from that told by patients wishing to impose on him. Secondly, it allowed him to leave the incurable without fear of reproach; and, most important of all, it provided the means for the doctor to tell to the patient and his relatives, in advance of any treatment, that he or she might not recover. Death or disability was thus not the fault of the doctor, who might not be able to overcome the odds stacked against him. It also, argued Edelstein, provided a way in which prospective patients could check a doctor's ability; by telling them in prognosis things that they already knew, although they had not themselves revealed it to him by speaking, the doctor could demonstrate his skill, and convince doubting patients to put their trust in so learned a healer.

Galen, however, goes far beyond this, and it is Galenic forecasting, not that of Hippocrates or Rufus, that becomes the hall-mark of the doctor forever after. In what does it consist? First, it demands both logic and practical observation. Of logic, I shall not here speak, except to note that the logic of Galenic diagnosis is impeccable, certainly far superior to that of many doctors. Observation, though, lies at the very centre of Galenic prognosis. Galen was a remarkable observer, whether of animals, like the mongoose, or of humans, from small children - some of whom seem to him to have been born naughty -, through peasants and pub owners, up to professors and politicians. He is one of those individuals who sees tiny details and remembers them; the smell of flowers on a hill-top, the size of fish in the River Tiber, the sound of a hunt going out on a frosty morning, and it is these observational powers that he transfers to the sick. He uses no, or almost no, mechanical aids, although on one occasion he heats up urine to see what colour changes occur when it passes from liquid to sediment. In this he is typical of ancient physicians: the only mechanical diagnostic aid known was a portable water clock for timing the pulse, but evidence for its use is hard to find. Galen thus relies on his own senses, sight above all. There is also touch - Galen's praise of the hand and fingers in his works on anatomy is a hymn to the wisdom of the Creator in devising so subtle and so perfect an instrument. By touch one can determine temperature, and similar bodily changes, as well as the pulse. Pulse diagnosis entered Greek medicine only in the last years of the fourth century B.C., but by Galen's day it was well established as a prime diagnostic aid. Galen wrote at least eighteen books on pulse lore, setting out not only how to take a pulse, but also its physiology (on which he was wildly wrong), and the proper interpretation of the qualitative changes it revealed. Sometimes, it was only by taking the pulse that one could discover the crucial signs of a particular disease – the double-hammer pulse, for instance, indicated a heart problem; sometimes it merely confirmed what other signs had suggested. Diagnosis by using urine played a much smaller role in Galenic forecasting, when it was usually seen and smelled, rather than tasted. The same would go for sweat and other excreta, but there are instances when Galen certainly tasted them – how else would he have distinguished two types of diabetes, one with a much sweeter taste than the other? Hearing the patient is also crucial, the sounds of the body, the rales and coughs, as well as the words of the patient. The patient's story forms a crucial part of the evidence on which Galen bases his judgment – and Rufus would have agreed with him. Galen stresses again

and again the importance of observation, of the patient and his environment, measured, wherever possible, against an understanding of his or her normal behaviour. Ideally, the doctor should know the patient in health as well as in illness; he should know the family, and the circumstances in which life is led. Ideally, too, the doctor should approach the patient with a substantial amount of learning behind him; the more one knows about prognostic signs, the better and more secure one's judgment. On this basis of observation, learning, and logic, Galen feels confident that he can reach a secure prognosis, a diagnosis of the cause of the disease, and a forecast of the course of the disease under the appropriate therapy. Both parts are essential in Galenic prognosis: first, identify the cause, and then set about its elimination. Once an appropriate method of elimination has been decided upon, one must disregard signs and symptoms that might suggest a different treatment, for these are at best secondary. The patient who falls into a sweat after the initial treatment, for instance, does not require an anti-sweating regime, if what is being aimed at is the removal of some peccant matter by sudorifics; rather, what is needed is reassurance to the patient that this is precisely what has been predicted and allowed for. Did Galenic forecasting work? Certainly Galen himself thought so, and provides us with a variety of case-histories to prove it. Together, they offer an impressive testimony to Galen's powers of observation, of diagnosis, and of persuasion, of his readers as well as of his patients. In his claims for what prognosis can do, he goes far beyond what others had done, and he established for centuries, and possibly even today, the model of the medical forecaster. If some of his stories seem like those of Sherlock Holmes, there is no need for me to expound the medical links between the two; if he stresses above all that his methods have a much better chance of success than those of the dream prophet and astrologers mentioned earlier, not many would disagree; and if he places supreme faith in the doctor's clinical judgment over whatever the patient might think, that expression of medical power is at least modified by his insistence that proper forecasting involves telling the patient, in the most sensitive and appropriate manner, what is going to happen in order to gain co-operation and trust. Few of today's doctors will not have followed these ideals, so modern do they sound, and so simple they may be in theory. I merely append two small observations of my own. The first is that after thirty years of wrestling with Galen, after having edited and translated his treatise on prognosis, I still remain impressed by his powers of observation. To me Galen the clinician is as much a hero as Galen the philosopher or Galen the anatomist, and I can see why the Arabs referred to his book on *Prognosis* under the somewhat inaccurate title of *The book of amazing stories*. But, secondly, as argued in the first part of this paper, one should always remember that there were many other types of medical forecasting around in Antiquity, and that our judgment of Galen, that pontiff of the medical profession, or of the art of prognosis that he so vigorously propounded was not shared by all those who competed with him in the medical market-place, or indeed, by all those who sought an answer to the question "Doctor, will I get well?"

THE ONE HUNDRED AND FORTY EIGHTH ORDINARY MEETING

The One Hundred and Forty Eighth Ordinary Meeting was held on June 14th 1997 at the Postgraduate Centre, Raigmore Hospital, Inverness. Some 35 members and guests heard Mrs Mary Beith give a most interesting talk, beautifully illustrated by slides, on "Traditional Medicines of the Highlands and Islands." This subject is covered in detail in Mrs Beith's book "Healing Threads" published by Polygon Books.

Mrs Beith's talk was followed by a paper by Dr M. J. Williams on Professor J. J. R.

Macleod's researches on the source of Insulin. This paper appeared originally in Practical Diabetes Volume 10 No 6, November/December 1993 and is published by kind permission of the Editor of Practical Diabetes International.

PROFESSOR MACLEOD'S RESEARCHES ON THE SOURCE OF INSULIN

Introduction

It is now an established fact that insulin is secreted by the beta cells of the Islets of Langerhans. This was conclusively proven by histo-chemical and immuno-pathological studies.

The first proof that insulin was produced by the islet tissue was, however, founded on experiments of a much simpler, more basic nature long before such refined techniques were available: they were performed by Professor J. R. R. Macleod, just a year after the discovery of insulin in his department by Banting and Best. His original work is now forgotten but is the subject of this present paper.

Early Experiments.

The Classic experiments of von Mering and Minkowsi in 1889 proved a connection between the pancreas gland and diabetes. They showed that total extirpation of the pancreas in dogs led rapidly to severe and ultimately fatal diabetes. Suspicion quickly hardened that the Islets of Langerhans must produce some internal secretion controlling carbohydrate metabolism. This was first suggested by the French histologist Gustave Edouard Laguesse who first named the groups of cells scattered throughout the pancreas gland-les Ilots de Langerhans (Islets of Langerhans) after the German medical student Paul Langerhans who had first described these structures in his doctoral thesis in 1869. (1)

All early attempts to demonstrate or isolate this hypothetical internal secretion were unsuccessful until Banting and Best, working under advice from Professor Macleod in the Physiology Department in Toronto in 1921, using immediate chilling of excised pancreatic tissue and alcohol as an extractive, were able to produce extracts with potent blood sugar lowering activity.

J Bertram Collip, a distinguished biochemist, then on a sabbatical year in Toronto with Professor Macleod, later joined the team and made vital contributions in increasing the potency and purifying the extracts, resulting in a preparation suitable for clinical use. (2)

Isletin/Insulin

When Banting and Best in their early experiments found blood sugar lowering activity in their crude extracts, they referred in their notebooks to the hypothetical substance as Isletin.(2) Professor Macleod preferred the word insulin, based on the latin root, and introduced their name for the new discovery at a meeting of the American Association of Physicians in Washington in May 1922.(3) He was then unaware that the name insulin had earlier been suggested by the great British physiologist Sir EA Schafer (later Sharpey Schafer), and on discovering this, Professor Macleod gave him due credit in all his subsequent publications.

The first important publication on the discovery of insulin in the British literature did not appear until early November 1922- an authoritative article "Insulin in Diabetes" by Professsor Macleod in the British Medical Journal (4). In a letter to the journal two weeks later Dr Cammidge, a Harley Street physician, questioned the propriety of the name insulin, as all the preparations used had been made from whole pancreas (5) Professor Macleod,

in his continuing researches on the physiological action of insulin had earlier decided to address this issue during a working holiday at the Atlantic Biological Station at St Andrews, New Brunswick, on the east coast of Canada, during the summer months of 1922. The Atlantic Station was the main research station of the Fisheries Research Board of Canada. Professor Macleod was friendly with the director, Dr A. G. Huntsman, who was then also Lecturer and later Professor of Zoology in Toronto. Professor Macleod was accompanied on the trip by his wife, a niece from Scotland who was staying with the Macleods for two years, and by four of his research students. Work was interspersed with golf, painting and picnics. In his research work, Professor Macleod exploited the earlier observations of a fellow Aberdonian Zoologist, Dr John Rennie, on the unusual anatomical distribution of islet tissue in certain teleostei (bony fish). In many of the twenty-five separate species he studied, Dr Rennie found that the islet tissue was quite separate from the acinous tissue, often existing as a discrete easily identified structure which he had earlier termed "The Principal Islet".(6) Its anatomical site varied, but in individual species was constant (7).

Location in the islet cells

Professor Macleod, using their new method of extraction, showed that he could produce extracts with potent blood sugar lowering activity from the principal islets of representative teleostei such as sculpin (Myoxocephalus) or angler fish (Lophius piscatorius), whereas extracts from the separate zymogenous (acinar) tissue was inactive. Extracts from the pancreas of elasmobranchs such as the dogfish (Squalus acanthias) and the skate (Raja) which had diffusely scattered islets, as in the mammalian pancreas, were similarly effective (8). These investigations seemed to show conclusively that the blood sugar lowering activity in pancreatic extracts – insulin - was the product of the islet tissue. Workers in this country later confirmed these observations (9,10), and further proof was provided by Professor Macleod and a co-worker on a return trip to the Atlantic Station in 1924. After initial extensive studies on the blood sugar level in sea fish and the effects of various external factors, they showed that removal of the principal islets (isletectomy), an operation they were able to perform quickly and safely on sculpin, led to prolonged hypoglycaemia, quite unlike that found in control fish, operated on in similar fashion, but without actually removing the islets (11).

By these relatively simple experimental methods, based on his knowledge of comparative anatomy, Professor Macleod, who had himself played a vital role in the discovery of insulin, was the first to prove conclusively that insulin was the product of the Islets of Langerhans.

The Nobel Prize

In 1923, the Nobel Prize for Medicine and Physiology was jointly awarded to Banting and Macleod. Banting was nominated as he had had the original idea and initiative for the research work, and had done all the early experimental work, aided by his student assistant Charles Best. Macleod was nominated as he had directed the research work throughout, and made major later contributions on characterising the action of the hormone. His work on locating the source of insulin was also specifically mentioned (2).

The award caused considerable controversy. Banting was incensed at the omission of his student associate Charles Best and immediately announced that he was dividing his monetary award with him. Macleod after more careful consideration, divided his share of the prize with Bertram Collip. These however were private arrangements, and it is

Banting's and Macleod's names alone which appear as the Nobel Laureates for that year.

In 1928, Professor Macleod left Toronto to return to his alma mater, Aberdeen University, as Regius Professor of Physiology. Despite failing health, he made many contributions to physiology and medicine both locally and nationally. He died in 1935. In his will he left his Nobel Gold Medal and citation to Aberdeen University and they are shortly to be on display in the Physiology Department where he himself had been a student and later worked.

The epitaph on his gravestone in a local cemetery rightly describes him as "The Co-Discoverer of Insulin. He was also the first to prove the source of insulin.

Acknowledgments

The information for this paper was acquired while researching the life of Professor Macleod in the course of writing his biography. This was published by the Royal College of Physicians of Edinburgh as a supplement to their Proceedings (12)

Funding for a visit to archives in North America was generously provided by the Wellcome Trust and Eli Lilly Co. The Manuscript was kindly typed by Miss Rebecca Moir.

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The Scottish Society of the History of Medicine

REPORT OF PROCEEDINGS
SESSION 1997-98

THE FORTY NINTH ANNUAL GENERAL MEETING

The Forty Ninth Annual General Meeting was held at the Scottish Health Service Centre at the Western General Hospital, Edinburgh on 25th October 1997. The minutes of the Forty Eighth meeting were accepted as was the Treasurer's report.

The President Dr H. T. Swan noted that the Spring Meeting in Edinburgh in 1998 would mark the 50th Anniversary of the Society. The four vacancies on council were filled by re-election of Miss Joan Ferguson and Dr Rufus Ross and the election of two new council members Dr Elizabeth Lazenby and Mr Roy Miller. Those who had served on the previous council were thanked for their contributions.

THE ONE HUNDRED AND FORTY NINTH ORDINARY MEETING

The One Hundred and Forty Ninth Ordinary Meeting followed the Forty Ninth Annual General Meeting at the Scottish Health Service Centre in the Western General Hospital, Edinburgh on 25th October 1997. The audience of some 70 members or guests included several members of the Royal College of Nursing. The nurses had been invited because Dr Eileen Crofton, one of the speakers, had been prevented from talking at a history of nursing meeting by an unfortunate accident. Dr Crofton read a paper entitled

A SCOTTISH WOMEN'S HOSPITAL ON THE WESTERN FRONT

The outbreak of war in 1914 was, unlike that in 1939, greeted with great enthusiasm. A wave of patriotic fervour swept the country; men enlisted in their thousands. There was an almost hysterical thirst for action combined with an astonishingly naive attitude to the realities of war as they proved to be in an increasingly technological era.

By 1914 women were becoming increasingly confident in their own potential. The campaign for the improvement of girl's education, which began in the middle of the nineteenth century was bearing fruit. Women were admitted to universities, new careers for women were opening up, there were major advances in the quality of nursing, and after a hard battle women were included on the medical register. In 1914 there were 500 women on the register and approximately 1500 women medical students. But women were still excluded from the vote.

The campaign for women's suffrage was gaining strength, particularly strongly in the years preceding 1914. There was much debate on how this was to be achieved. The National Union of Women's Suffrage Societies (NUWSS) under the leadership of Millicent Fawcett (a younger sister of Dr Elizabeth Garrett Anderson who was only the second woman in Britain to be included on the medical register) favoured a constitutional approach. These were the suffragists. Those who preferred high profile, dramatic and sometimes even illegal actions, followed Mrs Emmeline Pankhurst and her daughters in

the Women's Social and Political Union (WSPU) and were known as "the militant suffragettes".

Scotland had its own Federation of Women's Suffrage Societies (SFWSS) which was affiliated to the National Union. Dr Elsie Inglis was Honorary Secretary.

Elsie Inglis was one of the pioneer women doctors and saw the enormous possibilities for women, particularly medical women, which the war could provide. She had absolute confidence that women could work successfully in areas beyond those in which their activities had been largely confined; women and children, public health and the mission field.

As early as August 12th 1914 (war had been declared on August 4th) Elsie Inglis proposed to the Scottish Federation that they should provide a 100-bedded hospital for war service to be staffed entirely by women. The plan was endorsed by the National Union and an offer was made to the British War Office and the Red Cross. This was summarily refused. Nothing daunted, the offer was repeated to the French and the Serbian Governments. Conscious of deficiencies in their own medical services, both governments accepted. Elsie Inglis organised a national appeal, collected funds, appointed an organising committee which was to be based in Edinburgh, and called for volunteers. The Scottish Women's Hospitals were now in business, and by the beginning of December the first units left. In France the Scottish Women's Hospital was to be under the aegis of the French Red Cross. It was directed to the disused and neglected Abbey of Royaumont some 30 miles north of Paris. The abbey, a Cistercian and royal foundation, dated from the thirteenth century. It was a supremely beautiful building but totally unsuitable for the work it was to be called upon to do. Its situation however, was appropriate for the reception of war casualties from a considerable section of the Western Front, though the railhead at Creil was 12 miles away on very bad roads.

The first unit arrived at the abbey in the beginning of December. At its head, as Chief Medical Officer, was Dr Frances Ivens, a consultant in obstetrics and gynaecology from Liverpool. The success of the hospital throughout the war until its final closure in March 1919 was largely due to this remarkable and distinguished woman. Her dedication, administrative ability, surgical competence and qualities of leadership were outstanding, as were her humanity and compassion. She steered the hospital through the many crises which marked its progress. By never sparing herself she encouraged and inspired her staff to meet all the challenges they faced in the changing fortunes of war.

The first crisis was the appalling condition of the abbey itself. The new arrivals were faced with the dirt and debris of years, very little water, no electricity and almost non-existent plumbing. They scrubbed the floors by candlelight, manhandled the rubbish, while living themselves in the most basic conditions. Nevertheless they contrived to prepare part of the vast building for the reception of patients by early January. They became recognised officially as an Auxiliary Hospital, HA 301.

There was a second crisis in March 1915 when they were required by the French authorities to double their beds to 200. In the chaos of war conditions this presented them with great problems of staffing, equipment and supplies of all kinds including such basic items as food and fuel. These were overcome but it was not a happy time for those in charge of the fledgling unit. A well equipped x-ray facility had been in operation from the beginning and this was now supplemented by a mobile unit much valued by the French as it was the only x-ray in the entire district. A laboratory was established and was soon involved in pioneer work on gas gangrene which was so prevalent in battle casualties.

From a quiet and hesitant beginning the French authorities were now sending them

more and more severely wounded men as they became more and more impressed by their efficiency. This reached a peak in the autumn during the fighting surrounding the Battle of Loos.

As the year drew to a close the pressure on the hospital relaxed as winter brought a lull in the fighting. Valuable experience had been gained; they had passed their baptism of fire and the unit felt confidence in facing any challenge 1916 might bring.

This, of course, proved to be the Battle of the Somme in which the hospital played a crucial role. Casualties began to arrive on July 2nd, one day after the battle began. In the first 24 hours they admitted 127 desperately wounded men, many dying, and almost all suffering from gas gangrene, in the first week they performed 160 operations. The beds were again doubled, this time to 400. They were under intense pressure for three months. This peaked again on August 30th when 80 severely wounded men were brought in within 24 hours. The achievement of the hospital was recognised by the award of the Legion of Honour to Miss Ivens – a unique honour for a foreign woman.

The experience of the hospital in 1917 was very different. This was due in large part to the French mutinies which resulted in little action on their part of the Western Front. There were those on the staff who felt that they were not adequately involved. The critical fighting was taking place further north where the British were involved in the horrors of the Battle of Passchendaele. They feared that perhaps Royaumont had outgrown its usefulness. It was indeed fortunate that it did not move in view of future events. The French made a further request to Royaumont to set up a Casualty Clearing Station (CCS) 40 miles further forward at Villers-Cotterets. This was done, utilising an old army barracks, and by autumn 1917 both hospitals were functioning.

The German breakthrough, which started in March 1918, brought the fighting and subsequent casualties very close to Villers-Cotterets and on May 31st it was completely overwhelmed. They were first ordered to leave and evacuation was begun. Within a few hours the order was cancelled as their CCS was the only hospital still functioning in the area. With the Germans only 5 miles away and still advancing, the order to leave was repeated. They operated -by candlelight – up to the very last possible minute, when they left, losing not a single patient on the way. Back at Royaumont the two hospitals worked together but now faced the greatest pressure they had ever known, even including the period of the Somme battles.

Beds increased to 600. Casualties were very severe, gas gangrene was ubiquitous, and the turnover was rapid. They were required to discharge patients as soon as possible in order to admit more heavily wounded men. Standards of hygiene may have slipped but their high standards of medical and surgical care were maintained. A few of the doctors broke under the strain, not surprising in view of the torrent of work, the continuous stress and the lack of sleep but the work went on. As the tide of battle turned and the front gradually receded, the pressure reduced and by the time of the Armistice the worst was over. By Christmas all the patients, apart from 5 too desperately ill to be moved, were evacuated. The hospital finally closed in March 1919. The gratitude of the French Government was demonstrated by the award of the Croix de Guerre to 23 members of staff. From the British government there was no recognition.

The hospital was unique in many ways. By the end of the war it was the second largest of all the voluntary hospitals serving in France and the only one in continuous operation from January 1915 to the end. It was staffed entirely by women who, throughout all the rushes, had to rely on their own resources. The RAMC could re-deploy staff between casualty clearing stations to even out the pressure on individual units, and could bring in

reinforcements from base hospitals. There was no such respite for the women at Royaumont.

In addition to the intensive and skilful treatment of battle casualties they also, with the enthusiastic cooperation of the Pasteur Institute in Paris, carried out important research on the use of specific sera in the treatment of gas gangrene. As its founder intended, the story of Royaumont demonstrated that women could acquit themselves with distinction in fields far removed from those to which they had hitherto been largely confined. Although after the war there seemed to be little change in the openings available to medical women, probably aggravated by the large number of doctors coming out of the armed services, these increased steadily over the years, and the work undertaken by women in the first war must have played a part. Never again could it be said that women, purely on account of their sex, were too frail, too inadequate or too limited to take on any responsibility.

This paper was followed by one from Mr Roy Miller who spoke on the 300th anniversary of the birth of the pioneer obstetrician, William Smellie, entitling his talk.

WILLIAM SMELLIE A CONSERVATIVE IN LABOUR

In St. Kentigern's churchyard in Lanark there are two tombstones hard by the east wall of the church. The upright one is commemorative of William Smellie's parents. It tells us that his mother, Sara Kennedy "came into this life April 6 1657". At its feet lies a flat stone dedicated to William Smellie and his wife. The inscription on this stone begins "This is Dr William Smellie's Burial Place who died March 5th 1763 aged 66." He was therefore born in 1697, but no record of his birth was ever found in the Old Parish Records of Lanark

His mother, one can also deduce, was 40 when she bore him. In those days of poor standards of midwifery where might an elderly primigravid woman go to have her baby but to her mother? The Kennedys were a relatively wealthy family with a town house in Lanark but their home was the estate of Auchtyfardle, 5 miles away, beside Lesmahagow. A recent search of the Old Parish Registers there revealed the entry, "William, a son to Sara wife of Archibald Smellie 5th February 1697". Auchtyfardle house was demolished in 1957. Sara would not have recognised its appearance because of the many later additions which converted it into the Scots Baronial Style.

Smellie's father was a burgess of Lanark and a kirk elder. We know little of William's childhood other than that he was a pupil at Lanark Grammar School for which he retained a life-long affection. This is despite his claim that he was very idle and dull at school and was more taken up with carving and painting than his books. Nonetheless he achieved a working knowledge of Latin and French. It is uncertain how William Smellie entered medical practice. He began to practise in Lanark in 1720 but not until 1733, that is 13 years later, did be become a freeman of the local licensing body, The Faculty of Physicians and Surgeons of Glasgow. Unlicensed doctors were not uncommon in those days. Biographers have all regarded him as having served an apprenticeship with Dr John Gordon with whom he retained a lasting friendship. Dr Gordon was President of the Glasgow Faculty in 1755-1756 and again in 1763-1764. Did Smellie not seek apprenticeship until after he was established in practice? If he was taught by Dr Gordon before practising in Lanark why was there such a delay in registration? No one has answered this anomaly. Incidentally, Tobias Smollett who became Smellie's proof reader, editor and friend despite being 24 years younger was also an apprentice to Dr John Gordon.

Lanark, though small, is one of Scotland's oldest burghs and had about 2,000 inhabitants in Smellie's time. It was the centre for trading in wool and flax for several surrounding

counties and kept one of the standard weights of Scotland, namely the stone weight by which wool was weighed. It is also the place where the first blow for Scottish liberty was struck and is closely associated with William Wallace. Smellie's practice in Lanark included pharmacy, medicine and surgery as well as obstetrics. An account he rendered to Mr John Mair of Bankhead during this period is: "for the sum of Seven Pounds Sterling Money, with Twelve Pound Scots of Penaltie in case of faillie, being the agreed wages and fee for my pains in the Amputation and Cure of your leg performed by me in harvest last". It is dated 19th June 1723. In 1724, when he was 27 he married. There is no record of registration of the marriage but a notice of the Proclamation of Banns in the Lanark Parish Register for 1723-24 states : "William Smellie and Eupham Borland in the paroch of Hamilton, were proclaimed for the third time upon the last Sabbath of February 1724". Although they had no children the marriage appears to have been a felicitous one. His wife survived him by six years and is buried with him.

Very early in his career be began to note systematically whatever in his daily practice seemed worthy of recording as a lesson for the future. Thus were sown the seeds of his major work, because he began to develop an expertise in midwifery to such a great degree that he was often asked to consult in the surrounding towns and villages. He even managed largely to break down the prejudices of the local midwives who tended to call for assistance only when mother, child or both were in extremis. This meant having, in most cases, to indulge in destructive obstetrics to save the mother.

He read and assimilated the work of contemporaries in his constant quest to increase his medical knowledge. Dr William Cullen who began to practise in Hamilton in 1736 and thus was only a neighbouring practitioner for three years became a friend and remained so despite the fact that Smellie borrowed a constant supply of books which he was not wont to return in any great hurry. One of the books borrowed may well have been "Edinburgh Medical Essays" by Mr Alexander Butter, Surgeon in Edinburgh in which he described in a short article the use of French obstetric forceps. Although it is a Huguenot family, the Chamberlens who are credited with inventing the instrument and keeping it a family secret to their own great profit for almost 200 years, it was a forceps by Dusee which was described. Smellie procured, or had made, forceps to Dusee's design. He "found them so long and ill-contrived that they by no means answered the purposes for which they were intended".

This event occurred in 1739 and prompted him to record: "I afterwards perused the treatises of Chapman and Giffard, who had frequently saved children by a contrivance of this kind; and actually made a journey to London in order to acquire further information on this subject. Here I saw nothing was to be learned: and I proceeded to Paris where courses on Midwifery were at that time given by Gregoire. There likewise I was very much disappointed in my expectation ..."

One item in Paris did make an impression. Gregoire, father and son, used a dummy or phantom to demonstrate obstetric manipulations. This was a basket-work container for a real pelvis with black leather coverings to mimic the soft parts.

Smellie did not return to Lanark after visiting Paris but set up practice as accoucheur and apothecary in Pall Mall, London. In 1740 William Hunter lived with him for a few months having been given an introduction by Dr Cullen. Hunter had begun a medical partnership with Cullen in which each was to allow the other time to go and study. The partnership never continued. Cullen went on to Professorial duties at Glasgow then Edinburgh Universities. Hunter moved to be assistant to Dr James Douglas, another Scot, who was renowned as an anatomist as well as having a large midwifery practice. He, of

course, is remembered for his description of the peritoneum and the eponymous pouch. Hunter's London career is well known.

When Smellie arrived in London the bulk of obstetric practice was conducted by midwives, many of whom had a great reputation in Society but there was no proper training organised for them, nor was there any control over their practice. In fact, in England, the Bishops were their licensing authority and more interested in evidence of moral rectitude than expertise in childbirth. Any examinations asked were perfunctory and superficial. Actually it was Dr James Douglas who first agitated for better education of the English midwives.

The first practical moves in this direction were made in Scotland and particularly by the Faculty of Physicians and Surgeons of Glasgow where the minutes of a meeting of 3rd December 1739 record "that all midwives after a certain time shall pass an examination and have a licence from the Faculty before they be admitted to practise". An Act to this effect was submitted to the Faculty on 4th August 1740. "The said day the faculty having considered the many dismall effects of the ignorance of midwives and that it is incumbent on the faculty to prevent these evills as much as they can. They Therefore Enact that after the first of January 1741 any midwife who shall pretend as such to practise within the Shyres of Lanerk, Renfrew, Ayr and Dumbarton, without a licence from the faculty shall be fined the Sum of fourty pounds Scots for the use of the facultys poor .... And as the faculty have no other view but to prevent ignorant persons from practiseing midwifery They appoint that such as shall voluntary submit to one examination towards their being Licensed shall pay no freedom fine nor be at any further charge than two shillings sixpence Sterling to be paid the Clerk for each of their Licences."

Smellie began teaching midwifery in London in 1741. An advert he inserted in the London Evening Post in 1742 survives: "On Monday, 14th June, will begin a course of lectures on the theory and practice of Midwifery at 11am for women and 3pm for men, by Mr Smellie at his house in the New Court, formerly the Key and Garter Tavern, over against St. Alban's Street, Pall Mall."

His courses proved successful enough to allow him to move to more affluent premises in Gerrard Street and then Wardour Street in Soho where he lived until his retirement in 1759.

In 1745 he was awarded the degree of M.D. by Glasgow University as recorded in minutes of the Senate meeting of 18th February. "Dr Johnstoun having represented that Mr William Smellie, Practitioner at London in Physick and Midwifery, desired to have the Degree of Doctor in Medicine, and his ability and qualifications for the said Degree being well known to several members of the Faculty, and a testificat of the same, signed by three Doctors of Medicine at London, being produced, the Faculty agree to confer the Degree upon him and appoint a Diploma for that end to be expeded."

Smellie never had any lying-in-beds in any hospital but he was never short of patients because he offered to attend, gratis, poor women in their homes provided students could accompany him. Not only that, he asked his students that, in addition to the course fee, each contributed to a common fund to be disbursed among these same women. In his treatise he estimates that in 10 years he gave 280 courses in midwifery to more than 900 pupils exclusive of female students and delivered at least 1150 poor women over and above the difficult cases midwives asked him to attend. These figures do not include his extensive private practice. During this time he developed his own teaching phantom or female pelvis with articulated model babies to show the baby's natural progress during the birth process.

His "Treatise on the Theory and Practice of Midwifery" was published in three volumes. Volume I, published in 1751-52 contains the substance of his lectures including such diverse subjects as morning sickness and how to treat tongue-tie in the new born. Volume II, published in 1754 contains illustrative case histories. So does Volume III published in 1764, after his death. This volume is devoted to what he calls praeternatural cases i.e. difficult and unusual ones. His great friend Smollett proof read, edited and ensured the publication of the books.

In his Treatise Smellie gives the precise interior measurements of the pelvis for the first time. He also describes the various types of distorted pelvis and gives an excellent account of the aetiology of the flat pelvis associated with rickets. From these measurements Smellie worked out the changing position of the baby's head as it descends in birth.

All previous writers assumed it was natural for the head to appear first with the back of the head to the front of the mother's pelvis. It was as if the mother should lie on her back and allow the baby to creep into the world on its hands and knees.

Smellie even gave us the name for the process calling it "The Mechanism of Parturition". Without the use of modern terminology he describes it all in detail. His teaching was the birth of a new principle in obstetrics. Glaister in his biography claims that by this discovery alone Smellie became the founder of scientific midwifery. Incidentally, while considering 9 solar months as the normal gestation period Smellie declined to put an absolute limit to it, stating "yet in some, tho' very few, uterine gestation exceeds that period; and as this is a possible case, we ought always to judge on the charitable side, in the persuasion, that it is better several guilty persons should escape than one innocent woman suffer in point of reputation." He also exploded the belief that the placenta was always at the fundus of the uterus. Experience had taught him that it might be at any part of the interior. Smellie's name is forever associated with the use of forceps. He had not liked the forceps he had seen and was appalled that they were generally applied wherever a grip could be obtained, then pulled on with great pressure.

He devised a shorter, lighter instrument and invented his lock for interlocking the blades in a simple manoeuvre. He produced a pelvic curve in his forceps and formulated the rules for their use. His first forceps were wooden to make them more portable, also they wouldn't clink and terrify the patient. He appears to have discarded them after only a few cases, the blades of his metal forceps he encased in thin washed leather strapping. He felt it made them warmer and kindlier to the woman's tissues in use. One should also note, long before Semelweiss and knowledge of the cause of puerperal fever, Smellie decreed: "that the blades of the forceps ought to be new covered with stripes of washed leather after they shall have been used, especially in delivering a woman suspected of having an infectious disease." In his treatise he lays down the requisite qualifications of accoucheurs, midwives and nurses. For instance, a midwife "ought to be a decent sensible woman of middle age, able to bear fatigue and well instructed in the elements of practical midwifery."

"She ought to live in friendship with other women of the same profession, contending with them in nothing but knowledge, sobriety, diligence and patience; she ought to avoid all reflections on men practitioners; and when she finds herself at a loss, candidly have recourse to their assistance ... This confidence ought to be encouraged by the man ... who ought to rectify what is amiss without exposing her mistakes ... These gentle methods will prevent that mutual calumny and abuse which too often prevail among the male and female practitioners, and will redound to the advantage of both; for no accoucheur is so perfect that he may err sometimes ....." Despite these wise words and his helpful attitude

towards midwives he had many vituperative enemies, among them, most notably, a Mrs Nihill.

Smellie's most striking and beautifully illustrated publication is his "Sett of Anatomical Tables with Explanations, and an Abridgement of the Practice of Midwifery, with a View to illustrate a Treatise on that Subject, and Collection of Cases." Published by subscription in London in 1754 this book contains 39 plates engraved by Mr Grignion.

26 of the illustrations were drawn by Jan van Rymsdyk and are exquisitely done. Van Rymsdyk was born in Holland, the exact place and date are unknown but he appeared in London in 1750 and may have lived in the Hunter household for a time having also drawn for Hunter's book on the Human Gravid Uterus. He moved to Bristol in 1758 and set up shop as a Portrait Painter but was reduced to painting Inn Signs and wearing the cast off clothing of Mr Barratt, a local surgeon. It is obvious he was well versed in anatomical drawing and one must admire the beautiful detail of the baby's features. The original drawings are at Glasgow University as part of the Hunter Bequest. When Smellie quit London he left the folio to Dr John Harvie, his successor. When Harvie died the master's teaching material was auctioned in 1770 and William Hunter acquired the drawings.

Eleven of the engravings are in a simpler more diagrammatic style and in his preface to the book Smellie tells us that in these "Dr Camper, Professor of Medicine at Franequer in Friesland, greatly assisted me." Pieter Camper took Smellie's obstetric course on three separate occasions. He was a highly intelligent man. Back in the Netherlands he took 3 degrees in Medicine, in Physics and in Mathematics in the space of 12 years. As a noted Professor in his old age he became highly intolerant of opinions other than his own.

Camper's drawings are in the possession of the Royal College of Physicians of Edinburgh, having been donated by Dr John Burt in 1856. How they came into his possession is unknown. He became the President of the College in 1863. His obituary states that he was in all respects an Edinburgh Physician. His father and grandfather had been doctors in the city. However he did travel on the continent and obtained his M.D. at the University of Giessen in Germany. He died of Erysipelas in 1868. The 37th and 39th plates are described as "by another hand". They are solely of instruments and it is reasonable to assume that Smellie himself was the other hand. After pursuing an arduous and demanding life in London for 19 years Smellie returned to Lanark at the age of 62. His health was waning because of his asthma. He had retained an estate in Lanark known as Smyllum or Smellum. There he put his affairs in order, drawing up his will in 1759 to which he eventually added four Codicils. This was a joint will with his wife, only to be enacted after the death of both. William Hunter has written in the fly leaf of his copy of the Treatise: "The Author died of an asthma and lethargy at his home by Lanark in March 1763."

The story of William Smellie does not end with his death. The four codicils of the will are all concerned with his bequests to Lanark Grammar School. In summary he left his entire library along with two hundred pounds sterling to build a room to house the books – "according to a plan I have left." Any money remaining was to help repair the school and buy the Classics and "other useful books." To provide furnishing he left a large reading desk with a table-flap, a leather chair, "the smoaking little cheir in the Studdie" and high steps to reach the books. The schoolmaster was to be the librarian, accountable to the Bailies and Ministers of the Presbytery of Lanark once a year at vacation time. Finally he decreed that a catalogue of the books should be published.

Mrs Smellie died in 1769. Not until 1775 were the required alterations to the school completed. In 1803 the regulations for instituting the library were finally completed. In

1814 the trustees agreed that books could be lent out to try and make the library more popular. By 1828 it was remarked that the books were regarded as useless lumber. Because the fabric of the school deteriorated through the 1830's the Council built a new one, opened in 1841. It included the building of an upstairs room to house Dr Smellie's library. A larger school was opened in 1884 which went on fire in February 1888 only to be rebuilt and opened after that year's summer holidays. After the education act of 1872 the care of the books became vested in the School Board who were reluctant to allow anyone access to them. Professor Glaister in his 1894 biography recounts how he had tried in vain to see inside the locked cupboards when he was a pupil at the school. By this time the desk, chair and steps had disappeared as well as nine English "floots" (known to us now as recorders) also part of the bequest.

The Faculty of Physicians and Surgeons of Glasgow offered to care for the books in special cases within their own building but the School Board refused. In 1931 the 8th British Congress of Obstetrics and Gynaecology was held in Glasgow. The library was visited by a number of leading obstetricians who described the state of neglect as appalling. It was suggested the books should be moved to Glasgow University Library or the National Library in Edinburgh but it was decreed that Smellie wanted them to be in Lanark. They were therefore removed to the Lindsay Institute under the care of a permanent Librarian with instructions for the County Librarian to inspect them annually. Professor Miles Phillips of Sheffield, at his own expense had the books repaired as far as possible and re-bound by Mr Walter Slinn, a master craftsman of Messrs Northend of Sheffield. The books are now housed in a book case with a commemorative plaque.

Smellie's tomb lay unrecognised for many years in the graveyard of St Kentigern's Church. This is the Church where William Wallace is reputed to have wed Marion Broadfoot in 1297. There, hard by the east wall of the church the tomb was found. Smellie's gravestone and that of his parents were badly weatherworn to the dismay of members of the Edinburgh and Glasgow Obstetrical Societies when they saw them in 1929. Expert stonemasons regarded the texture of the stone as unsuitable for renovation. It was decided therefore to protect both gravestones inside a solid stone vault with a stout oak door. On 11th November 1931 a dedication service was conducted there by the minister of the Old Church of Lanark in the presence of members of the combined Societies. A brass plaque on the door bears the inscription which is on Smellie's gravestone. A rose now grows at the side of the door. A small notice at its root bears the inscription "Planted by Scottish Board to commemorate the Centenary of The Royal College of Midwives 1881-1981."

William Smellie left three portraits to the school. Those of his mother and of his father have certainly disappeared. There is some controversy about "my own drawn by myself in 1719". Smellie died in 1763. His requested alterations to the school were not completed until 1775. Did his executors comply with this part of his will? In his book on van Rymsdyk, John Thornton postulates that the parents were painted by John Smellie who was a local painter, recorded as painting the burgh's coat of arms on the canopy over the Council's seat when Lanark Old Church was extended in 1730. A. D. Robertson in his book, "Lanark, The Burgh and its Councils 1469-1880" goes even further, suggesting John Smellie may have been William's older brother. He bases this on the fact that the Council paid him for his work in the Church in guineas as between gentleman whereas tradesmen were paid in Scots money. Furthermore, William was admitted a burgess of Lanark in 1722 as an ex-apprentice of a burgess which was the manner in which younger sons were generally admitted. There is no mention of a sibling in any writing relating to the Smellies nor is there record of a John Smellie in the family grave. The argument is a tenuous one.

There does exist a portrait of William Smellie, hanging in the Royal College of Surgeons of Edinburgh. This was originally pronounced the self-portrait of 1719 by James Drummond RSA and as late as 1988 James Holloway, assistant keeper at the Scottish National Gallery wrote to Dr Blair, Obstetrician at the William Smellie Hospital, "So, on balance, I would continue calling the Royal College of Surgeon's painting William Smellie's self-portrait of 1719."

Miss Alison Stevenson, the College's Archivist disagrees, making several points in a letter; "The portrait is of a doctor well established in his practice in his middle age ... Besides, a young doctor of 22 years old would be working very hard setting himself up in practice and establishing his reputation and would he have had the enormous amount of time needed to paint his self-portrait? Moreover, why would he have wanted to paint a portrait of himself at that time of life, any way?"

She feels that the College portrait was painted by some unknown painter when Smellie was at the height of his career in London. It was eventually owned by Dr John Harvie, Smellie's pupil and successor to his practice in London. Harvie married Ann Hamilton, a niece of Dr Smellie, so it could have come to Dr Harvie via that route or Dr Smellie could have given it to him as a parting present, when he quit London. Harvie left the portrait to his son, a Writer to the Signet, who died unmarried in Edinburgh. The son left it to the Edinburgh College in 1828. In 1932 two copies of this painting were made by David Allison R.S.A. for R. W. Johnstone, Smellie's biographer of 1952 and for Professor Miles Phillips. One of these is in the Royal College of Obstetricians and Gynaecologists in London. John Thornton writing in 1982 says the copy Miles Phillips had in his study was intended for the Lindsay Institute after his death, but that its present whereabouts was unknown. One may wonder how hard Thornton looked because that is where it is, complete with a label as to its provenance on the reverse.

Professor S. J. Cameron who was instrumental in having the tiny mausoleum built over Smellie's tomb, was also responsible for establishing the William Smellie Memorial Hospital in Lanark. In 1934 a statue of a mother and child was unveiled in the grounds of this maternity hospital in the presence of Professors Cameron and Miles Phillips along with Patrick Maitland MP and Provost Meiklejohn. Dr T J Honeyman was there, too, assuredly as the person who arranged the commissioning of the statue, which is the work of Denis Peploe, son of the Scottish Colourist S. J. Peploe. Sadly a housing estate now replaces the hospital but the statue is safe within Lanark's Health Centre and maternity provision is now within a new unit at Law Hospital aptly named the William Smellie Memorial Unit. Obstetric practice has seen many great advances in recent years but the contributions to the art of a modest man born 300 years ago remain the foundations of that art. He is rightly regarded as the master of modern midwifery.

THE ONE HUNDRED AND FIFTIETH ORDINARY MEETING

The One Hundred and Fiftieth Ordinary Meeting of the Society was held in the Symposium Hall of the Royal College of Surgeons of Edinburgh on 28th of March 1998.

The President, Dr Harold Swan was in the chair and opened the meeting by reminding members that this year was the Fiftieth Anniversary of the Society's foundation, the first Meeting of the Society having been held on the 23rd of April 1948 in the Hall of the Royal College of Surgeons of Edinburgh.

He reviewed some of the events in the history of the society and drew the attention of members to a small exhibition on this subject prepared for this meeting by Dr David Wright.

He then introduced the first speaker Dr Owen Dudley Edwards whose subject was "Sir Robert Christison 1797-1882". Dr Edwards gave a masterful and highly entertaining talk illustrated by readings from the writing of Christison and others.

The second speaker was Dr Ernest Jellinek who talked on Sir Harold Stiles.

SIR HAROLD STILES 1863-1946

I was privileged to know Sir Harold Stiles between 1935 and 1937 in his retirement. He had been the sixth Regius Professor of Clinical Surgery at Edinburgh (1919-1925) and President of the Royal College of Surgeons. His grandfather Thomas Stiles (1798-1894), a Lincolnshire doctor, had been apprenticed to Sir Astley Cooper and he and Harold's GP father had taught him dissection in his teens and inspired his surgical vocation. Harold qualified in Edinburgh in 1885 as the Ettles scholar of the year. He became house surgeon to Professor John Chiene, a Listerian surgeon, for whom he acted as "spray clerk". After some months with Theodor Kocher in Berne he forsook antisepsis and became a pioneer of asepsis in Edinburgh. During his two decades at the Royal Hospital for Sick Children he became, according to William Mayo, one of the outstanding practitioners of surgery in Europe.

His paediatric experience led to advances in the surgical treatment of tuberculous bones and joints, and to a better appreciation of the risk of bovine tuberculosis from cow's milk (in disagreement with Robert Koch), and the importance of the eradication of tuberculosis in cattle. He led the field in transplantations of the ureters into the colon for congenital malformations of the female urinary tract. His excellent analysis of congenital pyloric stenosis almost gave him the priority for Ramstedt's operation but his one (unpublished) case treated thus died. His various efforts to relieve infantile hydrocephalus were doomed.

Stiles' early work in adult surgery concerned the pathological anatomy of breast cancer, where he favoured radical surgery. In his later years he dealt with much World War One trauma and wrote a monograph on operative treatment of peripheral nerve injuries.

His transatlantic activities brought Cushing to Edinburgh for his lectures on the "third" (CSF) circulation, and he helped to get the young Norman Dott to Boston for his neurosurgical training. His advanced views on the organisation of the surgical specialties did not mature in his life time.

After premature retiral from surgery Stiles pursued his interests as a naturalist, particularly in geology and botany. His enthusiasms included photography; indeed perhaps his greatest prodromal work was X-ray angiography and bronchography: in 1897, two years after Rontgen's discovery, he published X-ray pictures in "Nature", and in the Journal of Anatomy and Physiology, of arteries and veins and of the bronchial tree, in dead infants injected with mercury.

An extended version of Dr Jellinek's paper has been published in the Journal of Medical Biography 1998 volume 6 Pages 128-133.

After these papers members had tea, the centrepiece of which was a magnificent 50th anniversary cake, which had been made by Mrs Bronwen Wright and iced by Mrs Sally Bryson.

THE SEVENTH HALDANE TAIT LECTURE

The Seventh Haldane Tait Lecture was held on 6th May 1998 at Craigiehall, Queensferry Road, Edinburgh, the Army's Headquarters in Scotland. 85 members and guests were

present and the President Dr Harold Swan introduced the speaker Mr John Blair, a former President of the Society, a former President of the British Society for the History of Medicine and Reader of the History of Medicine in the University of St Andrews. Mr Blair's subject was "Not least in the Crusade-The Centenary of the Royal Army Medical Corps".

NOT LEAST IN THE CRUSADE – THE CENTENARY OF THE ROYAL ARMY MEDICAL CORPS

The Royal Army Medical Corps had an unusual procreation. A hundred years ago, the British Medical Association analysed the opinions of 1200 medical officers in the Army and the Royal Navy. They noted the discontent, and asked the Secretary of State what action he proposed to take. The BMA did this for a good reason. There had been a war in the Middle East, when the medical cover was the highest for any military force sent out of Britain. In the event, the war was over soon, casualties were slight, and those which did occur were treated and evacuated quickly and well. And what had happened ? As soon as the troops returned back, the Government of the day decided to reduce the establishment of the Army Medical Services by 50%. The inevitable resulted - all the best left. Every medical officer of ability and ambition saw no future in the prospects. Those left were overworked, overstrained, harassed by constant postings, and had no opportunity of taking up the new post-graduate training then becoming available.

The Secretary of State's reply was: "these opinions must have been obtained and expressed in a manner altogether in contradiction of military discipline. Medical officers, like other officers, have a proper channel through which they can be heard, and I am not prepared to accept any Civilian Association as their mouthpiece."

The BMA replied in due course, very fairly but very critically about the state of affairs within the Armed Forces Medical branches, now worse than ever. "It is no wonder that the British Army Medical Service is on its way to extinction. It is impossible for anyone acquainted with this state of things to regard with equanimity the prospect of a war. If such a calamity were to overtake us, it is difficult to see how we could avoid the utter collapse of the medical arrangements. A spectacle of misery and mortality to equal the horrors of the Crimea would not be a matter of astonishment."

This warning was laughed to scorn by senior officers. But the BMA went to the major medical figures of the day, including Lord Lister (who was one of the ignorant civilians the War Office had earlier dismissed), and all of a sudden, the government gave way and advised Queen Victoria to sanction the formation of the Royal Army Medical Corps. It was the BMA, not the military, and certainly not the politicians, who brought about this new Corps' birth. Their interest and support have been maintained since.

Unfortunately for everyone the Boer War broke out the next year, as always, unexpectedly. The new changes had not worked through and there were not enough serving officers, in quantity or in clinical ability, to make the numbers needed. Hundreds of civilian doctors and nurses, with no knowledge of military medicine or surgery, flocked to Southern Africa to make up the shortfall. 385 civilian doctors went, plus nine senior consultants, these at a cost far higher than if Army men had been used. There were only 476 RAMC officers in total. So the majority of those dealing with the actual sick and wounded were civilians.

The Boer War has been called the last war fought between gentlemen, where the combatants stopped from time to time to have a cup of coffee, and discuss matters

especially dealing with wounded, and then later return to combat. It has also been called the first European War of modern technology, of wireless telegraphy, observation balloons, Listerian principles in surgery, anaesthetics and X-Rays. Journalists were there a-plenty, and would be from now onwards in attendance in all wars. The writings of Mr Burdett-Coutts, M.P. for Westminster, rivalled those of the present in their fierce overstatement and spiteful sensationalism.

Because of the dry clean terrain, wounds healed well. The notion of the 'merciful bullet' appeared. The new high velocity bullets, fired over long distances, were thought to produce wounds which did not necessarily demand exploration. They were of 1850-2000 fps muzzle velocity. The surgeons, civilian and military, thought a new era had arrived. Even abdominal exploration, now possible under general anaesthesia, was considered un-necessary. The medical side was different. Because of the arrogance and stupidity of the most senior officers, hygiene was ignored. The Commander-in-Chief, Field Marshal Lord Wolseley, the most scathing antagonist of all, stated that: 'the hygiene specialist should be sent as far away from the battlefield as possible, there to indulge his fad.' The enteric fever outbreak at Bloemfontein, where there were 6,379 cases and 953 deaths, and the grand total of 57,684 cases with 8,022 deaths, brought about the Royal Commission after the War was over, and nearly destroyed the new Corps until the blame was correctly determined. Needless to say, the names of the politicians and those senior officers responsible for the failures of planning escaped the record and avoided censure. But the aftermath led to a great change. The new Royal Army Medical College in London at Millbank, opened on 15th May, 1907, was a huge boost and led to recruits of high quality flocking to enlist. No-one from the Big Outside World of Medicine wanted the old one near Southampton at Netley. It was too far from the capital and from the centre of things. It is clear from the records of the time that the priority was for a *College* and not a hospital; the recent insistence that the opposite is so, is false. The far-seeing changes of the bustling General Sir Alfred Keogh (who worked hand-in-hand with the BMA and went round the whole country speaking), for accelerated promotion on merit, post-graduate training and other career advantages, the institution of a proper School of Hygiene in Aldershot, and of Lord Haldane in 1908 with the formation of the Territorial Force and the setting up of a reserve of talent from civilian volunteers, led to the Medical Services being better prepared for the Great War soon to break out than probably at any other time in British History.

The Great War was very different from the Boer War. This time the battles were fought over soil tilled for a thousand years, and tetanus and especially gas gangrene were soon rife. "We have gone back" said Sir Alfred Keogh in October 1914, "to the infections of the Middle Ages". The major fields were Flanders, with thunderous gun barrages and cold wet mud, and huge casualty numbers; the Dardanelles, where the majority of troops were British; and Mesopotamia, where senior Army Medical Generals pretended that all was well when it was not, and a junior officer, Lieut-Colonel Carter of the Indian Medical Service, had his career destroyed by the malice of superiors for daring to speak the truth about failures in casualty management.

But the major problems were overcome. Inoculation against tetanus and typhoid, delayed primary suture for wounds, the Thomas splint for femoral shaft fractures, protection against poison gases, the diagnosis and management of shellshock and functional cardiac disorders, the management of skin disease, the method of casualty evacuation, the scientific work on the patho-physiology of surgical shock in 1917, brought the RAMC to its highest point of success and esteem within the 'Big Army' of the day. At the end of the War, there

were more Army Medical Service persons in post than the total number of the original British Expeditionary Force. The individual bravery of the Corps members was noteworthy. Everyone must know that the only British double VCs were awarded to RAMC officers, Martin-Leake and Chavasse, but the multitude of others, and the decorations for gallantry other than in battle, given in all theatres over the century, was not approached by any other medical service nor ever will be.

The contribution of civilians must be recorded. Sir Anthony Bowlby, the consulting surgeon, who conceived the idea of the casualty clearing station, recorded in his extensive diary how amused he was as he began to be shown respect on reaching honorary general's rank. Before that, he was looked down upon by military seniors. The run-down between the wars was made less dangerous by the continuing activity of the Territorial Army, who carried out field training which their Regular colleagues did not. The Territorial Army was now a reserve Army in its own right. The wonderful Headquarter Mess and College was preserved, the jewel of the Corps. But as ever the politicians broke their promises or procrastinated.

Promises made to the TA were 'modified' because Belisha Beacons had to be given financial preference in 1938. In 1938 and 1939, the British Medical Association once more entered the fray by demanding more military medical support, this time also for the emergent RAF Medical branch. In 1940, with the Army beaten in France and the Royal Navy unable to do more than guard sea routes, it was the Royal Air Force which won the Battle of Britain and saved the nation, and made its name for all time in our history. In the Second World War the Corps reached its highest level of prestige of the century. The use of blood for transfusion and Advanced Surgical Centres in the Western desert, the pioneering work on antibiotics, the use of DDT in the Far East, and the advances in a range of 'ordinary' medical things, went along with the high standard of community health the Army Health teams achieved. Even in the Forgotten Army in Burma, standards were high. For example, the survival rate in the 14th Army in Burma was 95%, essentially the same as the 92.8% in the British Liberation Army of Normandy and the 95% rate in the clinically star-studded Central Mediterranean Force. It was in Burma that air evacuation was first used in large degree - it would from now on be the major method of casualty removal from battles. Post-1945 saw the outbreak of the Cold War, and the need to maintain large military forces. During the National Service Era, the shortfall was made up by conscripted men and officers. It continued till 1961. The Korean War was a shooting war; there were also Malaya, Borneo, Cyprus, the Falklands and the continuing war in Northern Ireland, for the RAMC to doctor. The end of the Cold War meant a peace dividend. While it had gone on, 80% of the medical support for such a war in Europe was provided by the TA and only 20% by Regulars.

And then in 1990-91, there was a war in the Middle East, the Gulf Campaign. The medical support for that war was the highest for any military force sent out from Britain. In the event, the war was over quickly, casualties were providentially slight, and those which did occur were treated and evacuated quickly and well. As soon as the troops returned home, the Government of the day decided to reduce the establishment of the Medical Services. Though reductions were necessary, and the initial plan would have been suitable, the Rifkind plan of 1993 was flawed in concept and calamitous in execution. The senior officers lost control, as one told me; as a century ago, the best left. Every medical officer of ability and ambition saw no future in the prospects. This time 'it was a whole generation' that was lost.

As a century ago, the British Medical Association entered the fray, spurred by the

multitude of angry letters from its service members. And in historical terms, the behaviour of the senior officers was exactly the same as in the 1880's. A conference was arranged in 1995 but the Surgeon General of the day. Vice Admiral Anthony Revell, told his senior officers not to attend. A letter to BMA by Surgeon Commodore M.P.W.H. Paine, Assistant Chief of Staff, Medical and Dental, in the Commander-in-Chief's office at Northwood, mirrored that of a century earlier; it showed the same tone and attitude :

"Dear Sir, BMA Conference for Armed Forces Doctors - 19 September 1995. I am unwilling to address or attend your proposed conference; the implication that medical officers in the Armed Forces have not been informed is refuted: their concerns are best expressed through the proper channels."

"The Navy is the favourite Service with this Government", said Mr Julian Brazier, TD, an MP in the Defence field, in 1995. It is the thinking Service; the Army is well behind and the RAF nowhere." When asked if this meant that the Royal Navy was prepared to do the Conservative Government's bidding without questioning, he answered "yes"

Confrontation with the BMA went on for four years, again as a century before. The Association was ridiculed by Commodores and Admirals, in language unbecoming and often offensive. Its legacy will persist. In private meetings, answers were made to BMA questions which were false. At a BMA seminar where the results of a confidential survey of 600 doctors serving full-time - exactly as a century before - was presented on 27th March of 1997, (and many were the bitter complaints that senior officers had not kept them informed or treated them with consideration - this was why they had not used Commodore Paine's proper channels), a Major-General jumped to his feet and demanded: 'This must stop'. He could not bear to see and hear what devastating things Members of Parliament and of the House of Lords, let alone the medical officers, had written. Here was history in the making. With the appointment of Air Marshal John Baird as Surgeon General in 1997, there was an immediate change. Now was courtesy, respect, and he actually asked the civilians for their advice. But fear remained. In 1997 and 1998, the chairman of the Armed Forces Committee of BMA used the words 'near to extinction', as his predecessor had done in 1896. The Minister of State, Dr John Reid, praised the BMA for its stand and indicated that the worst errors would be reversed. Happily, and following the centenary year, we may end on a hopeful note; the RAMC will endure. It has to, as it is by far the largest, most diverse, and most important of the Armed Forces Medical branches. And it has by far the most distinguished record of bravery and service to Queen and Country. It now looks to the next century with a degree of hope. What does this great Corps do?

PREVENT DISEASE WHERE POSSIBLE
COLLECT AND REPAIR THE WOUNDED
CURE THE SICK
REHABILITATE THE BROKEN

And we can end by quoting from the RAMC hymn:

UNARMED THEY BORE AN EQUAL BURDEN
SHARED EACH ADVENTURE UNDISMAYED
NOT LEAST THEY EARNED THE VICTOR'S GUERDON
NOT LEAST WERE THEY IN THE CRUSADE.

THE ONE HUNDRED AND FIFTY FIRST ORDINARY MEETING OF THE SOCIETY

The One Hundred and Fifty First Ordinary Meeting of the Society was held on the 13th of June 1998 at Woodend Hospital Aberdeen. 41 members or guests attended and the President Dr Harold Swan introduced two Speakers.
Professor Andrew Calder, of the Centre for Reproductive Biology in the University of Edinburgh took as his subject "Obstetrics : A Scottish Monopoly" and Mrs Margaret Campbell, Lecturer in Design History at the Edinburgh College of Art, talked on "An Architecture for Hope : Some Modernist aspects of design and architecture and their association with Tuberculosis"

ARCHITECTURE FOR HOPE (SOME MODERNIST ASPECTS OF DESIGN AND ARCHITECTURE AND THEIR ASSOCIATION WITH TUBERCULOSIS)

Scottish weather, particularly summer weather being as it is, allows us to experience warm sunny spells. Too often these are interspersed with wind, rain and even on occasions, snow. When I was about twelve my parents moved to Morningside in Edinburgh and it was then that I first saw the Napier Flats in Colinton Road, and the concrete flats in Falcon Avenue, with their balconies (1) I was intrigued with these 1930s architectural features, which were not used for sitting out. Instead they seemed to be used as either rather large window boxes or more frequently just empty spaces.

In 1962 I returned to Edinburgh, after having studied design in England for four years. I was by then well imbued with the modernist theories of functionalism. Doing the daily "school run", I admired, for their Thirties modernism, the three white slab blocks of flats with their flat roofs and balconies in Ravelston Gardens.(2) This was at a time when splendid examples of Thirties Scottish architecture were either being allowed to deteriorate, like the Maybury Roadhouse in Edinburgh, or being demolished to be replaced with Sixties New Brutalism. Caught up with teaching, a design consultancy and bringing up a family, I never questioned why these buildings with their flat roofs and balconies were so incongruous and impractical for the Scottish climate and lifestyle. I simply accepted them as a stylistic example of International Modern architecture, of which the four young progressive architects who designed them during the 1930s, would have been well aware. It was not until the early 1990s, when I saw the Napier Flats being restored to their original appearance, (not hygienic white, but a warm cream with red brick), that I began to wonder why balconies were used on so many domestic buildings of this period and whether there were other design features which posed similar questions?

I began to look at examples of twentieth century "Classic" buildings such as Gerrit Rietvelt's Schroeder House (1923-4), or Le Corbusier's Villa Savoye (1928-9) and furniture such as Le Corbusier's Chaise longue (1928) and Marcel Breuer's Isokon Chair (1935).

During this time my mother died in Southfield Hospital and this reminded me of the time she had spent in the City Hospital in Edinburgh during 1951-53 with tuberculosis. In addition, one of my students was investigating the changing uses of Edinburgh mansion houses and this led me to inquire as to who had originally owned the house and grounds in which Southfield Hospital had been built.(3) This inevitably led me to Sir Robert Philip and his pioneering work on tuberculosis.

Coincidence - maybe, but as I put these stray ideas together rather like a jigsaw, the resulting associations have led me to the conviction that, during the early twentieth century, tuberculosis had such an impact on the economy and lifestyles of all strata of society, that inevitably it also played a contributing role in modernist design and architectural thinking. I have also been aware that a number of architectural and design historians are too young to have experienced the impact tuberculosis had on every aspect of life. Since 1995 this is what I have set out to explore. I am now in the process of writing up my findings in dissertation form and it is a summary of these conclusions I present in this paper.

My research has taken me to Davos, Hilversum, Paimio, Banchory and Midhurst, to various specialist libraries such as the Royal College of Physicians in Edinburgh, the Wellcome Institute in London, the National Library of Scotland, Edinburgh College of Art Library and the Dokumentbibliotek in Davos. I have also had the good fortune to be able to discuss these ideas with men who were central to the combat of the disease during the 1950s; Sir John Crofton, Dr Christopher Clayson and Professor James Williamson and Professor Ian McCallum and his wife Jean, all of whom have been so generous with their time and counsel.

The sanatorium movement saw the setting up of communities where the principles of isolation, fresh air, good food and rest appeared to make an appreciable improvement on the alarmingly high mortality rate of the late nineteenth and early twentieth centuries. When one considers that the highest incidence of the disease was predominantly in the overcrowded urban working class areas it is understandable that some measurable improvement was achieved. However despite Robert Koch's identification of the tubercle bacillus in 1882, it was not until Waksman discovered the antibiotic streptomycin in 1943 and the subsequent work by Crofton and his team in Edinburgh, that the disease was defeated, though not entirely, (as we now know with sadness and regret).

The *luftkur* as practised by Hermann Brehmer at Gorbesdorf in 1867 and the *luftliegekur* by his student Peter Dettweiller at Falkenstein in 1874 inspired the building of the first purpose-built tuberculosis sanatorium in England at Midhurst in West Sussex. Edward VII, who saw himself as a modern monarch, despite being in his sixties when he acceded to the throne, was so appalled by the incidence and mortality from tuberculosis that he determined more had to be done to treat the disease and to curb its spread. He arranged for an essay competition to act as a sort of think-tank of ideas.

The winner was a young architect, Charles Holden, who was working for H. Percy Thomas, whose well established architectural practice specialised in hospital design. It was the intention that the winning design would act as a model for others which would be built under the patronage of the King. The King's Sanatorium (1901-1906) at Midhurst consisted of two two-storied patient wings or pavilions, each individual room having its own terrace-balcony. These wings were placed on either side of a central block which contained two entrances, one for the well-to-do Class 'B' and the other for Class 'A', as well as administrative, communal and medical facilities, together with a unique open-air chapel. The whole building was sited on the south-facing pine-clad slopes of the Sussex Downs, with formal landscaping and graduated walks by the well-known garden designer Gertrude Jekyll.

Holden's design was based on the pavilion-type arrangement which had been devised by Dr Karl Turban of Davos for his own Sanatorium built in 1889. Davos, since the 1870s, had been a favourite place for both visitors and tuberculosis patients. Its reputation for having a beneficial climate for respiratory ailments was established by Dr Alexander

Spengler between 1853 and 1866. With the extension of the railway from Landquart, Davos was within two hours journey from Zurich and twenty-four from London and attracted a wide range of British, continental and American visitors.

Chalets were rented out by local residents and entrepreneurial hoteliers like Buol, distinguished visitors included Robert Louis Stevenson and his wife Fanny, Arthur Conan Doyle, Albert Einstein and the German Nobel Prize-winner for Literature, Thomas Mann and his wife Katia. In 1912, when staying in Davos while his wife was receiving treatment for a lung complaint (not TB), he collected material for his novel *The Magic Mountain* (1924). This novel provides a most interesting account of the affluent patients, their hopes and despairs, and the then advanced treatment methods, such as artificial pneumothorax, which were used in some of the more progressive clinics and sanatoria in Davos. Comparisons with Mann's descriptions can be made with the great palace-sanatoria of Schatzalp (now the Berghotel Schatzalp), the Wald Sanatorium where Katia Mann was treated (now the Wald hotel) and Dr Hans Philippi's International Sanatorium which is still a clinic for a German Insurance Company. In the 1950s several hundred patients with respiratory tuberculosis from the Edinburgh area were sent out to Davos St Wolfgang (4) for treatment, as there were not enough beds available in the local sanatoria.

When I visited Davos, I found three key pieces of my modernist jigsaw puzzle: the flat roof, the balcony and the chaise longue. The first piece is the flat roof. With the influx of tourists of one kind or another the Davos city council decided to provide a pavement along the main street called the Promenade. This meant that people could walk safely away from the carriages and the slushy puddles in the spring thaw. However this caused another more serious problem. During the thaw, mini avalanches fell from the roofs on to the passers-by and, even more dangerous, dagger-like icicles which had formed from the eaves of the buildings broke off, causing some very nasty, even fatal injuries. Something had to be done. A local chalet-builder devised a method of constructing a flat roof which prevented these incidents from occurring. The principle of the double skin, centrally-drained flat roof construction had been worked out earlier in Germany and it was on this that the Davos builder based his system.

The second jigsaw piece concerned balconies. Traditional central European chalet construction incorporated a projecting balcony. This was a passage to facilitate access and ventilation, yet protected by the overhanging roof. These timber and stone chalets were frequently rebuilt and, with the increasing demand for chalet accommodation by invalids and their families, a number of these were rebuilt, but with extended balconies. Cast-iron was used instead of timber as these balconies had to be deep enough to take either a single bed or a reclining chair for invalids to take "the Cure". Such balconies then became integral to the design of the many sanatoria which were built in Davos, as well as other Swiss and German health spas, and in Britain at Midhurst and at Nordrach on Dee, in Banchory (in 1900).

The third jigsaw piece is the reclining chair or *chaise longue*. While looking through articles on Davos as a Cure centre in the Davos Reference Library, I noticed the number of photographs and cartoon drawings of patients, fully wrapped up, surrounded by deep snow and resting in bentwood reclining chairs with long footrests, or in bentwood or timber slatted *chaises longues*, which resembled steamer chairs. This type of rest chair was made in thousands by such manufacturers as the well known German firm Gebruder Thonet from the 1860s onwards. (The company still makes bentwood chairs as well as metal ones). This type of recliner chair was the predecessor of the elegant modernist *chaise longue* which was an essential item of furniture in every modernist house or flat,

although it also carried the stigma of "lounger". The yellow painted Davos *Hegestuhl* is still produced by a local manufacturer.

My hunches were coming together, but I had to have some evidence that the architects and theorists involved in establishing modernist ideas in the early 1920s and 1930s, had some direct awareness of the economic drain tuberculosis was having on society and were actively working towards its alleviation through design. During the late nineteenth century the urban middle class expressed a growing interest in hygiene, which was associated with dress reform, the Garden City Movement and an overall concern with a healthy lifestyle and improved living conditions. This involved vegetarianism, regular exercise and sleeping in the open-air, even in the nude. Houses as at Letchworth Garden City (1903) were designed with many of these ideas in mind, though these were in a late Arts and Crafts "cottage" style. In 1914, the architect Barry Parker added a sleeping porch to his house, "Crabby Corner". It was in the influence that these ideas had on social (public or local authority) housing that the initial impact was found. What constituted a healthy (hygienic) dwelling? This relied on efficient ventilation and adequate light, especially sunlight and *"Licht und Luft"* was a popular slogan for sanitary and housing reformers. The Brehmer/Dettweiller theory of fresh air and rest, the *"freiluft/liegekur"*, as a "cure" for tuberculosis was also incorporated into the idea of the "hygienic house".

Paris pioneered this change. Acutely aware of the relationship between tuberculosis and overcrowded inner city housing in 1900, the Paris housing authorities, the Casier Sanitaire, identified a zone in central Paris which had an exceptionally high tuberculosis mortality rate. In 1904 a special study was made of houses and flats specifically affected by tuberculosis. This was followed by the Prefect of the Seine forming a committee to study the relationship between housing and tuberculosis, the outcome of which was to demolish any buildings which did not allow a sufficient amount of sunlight to penetrate the inner courts and stairwells or into the rooms. By 1910, six "tubercular zones" had been identified for slum clearance grants. (5)

In the influential art magazine *The Studio* (1906) there was an extensive account of a housing competition for "rational, healthy and comfortable buildings"(6) for the working classes in Paris. The first prize for "The Rothschild Artizans' Dwellings" was awarded to the French architect Augustin Rey with a sum of ten million francs, which had been contributed by the Fondation Rothschild for the building of such a scheme. "M. Rey arrived at the conclusion that the inner courtyard, where the air is never renewed, is the most favourable ground for the development of tuberculosis and other bacterial diseases". A second reference to tuberculosis was made in connection with the lighting of the living room. "We usually find here that the walls on either side of the window and above it never receive light directly, while the ceiling is only lighted obliquely. These conditions, as all our great men of science have demonstrated, are the most favourable for the development of tuberculosis and all germs of disease. Now light, these scientists tell us, acts in such a manner that the microbes are destroyed as fast as they are produced; it is desirable therefore to expose all parts of a room to the direct action of light". (7) The horizontal ceiling was modified by curving it towards the back of the room, so as to allow the reflected rays of light to illuminate completely the whole ceiling. Not only light, but the circulation of air including larders and airing cupboards was discussed. Other refinements included a dust chute in each kitchen "available at any hour, for the removal of dust and refuse. Each shoot discharges into small boxes in the basement, which are conveyed every morning to two little stations at the end of the parallel corridors. A cement receptacle for soiled linen is also at hand".(8) As it was only tuberculosis that was

specifically identified in this article, this seems to indicate the serious concern there was about the effects of the disease on the French working class at this time and how suitable housing could be used to control the spread of the disease. (9)

In Germany, the architect Peter Behrens (1868-1940), regarded as one of the founders of the Modern Movement in architecture, had as his principal concern, the promotion of health and specifically the problem of tuberculosis. Later the radical philosophy known as *Existenzminimun* [Minimal Living], resulted in the design of progressive social housing schemes. *Existenzminimum* philosophy was not only relevant to financial concerns but also to the "biological and sociological conditions of the human beings that come into account for dwellings for the living income earner" which "give us dwellings, however small" that "are healthy and habitable and before all, make the rent bearable" (10) This reference to "biological" indicated an awareness of the impact of infectious diseases such as tuberculosis and diphtheria which at that time had such a devastating effect of urban working communities. An article in the periodical *Die Wohnung* [Housing] on "Wohnung und Tuberkulose" [Housing and Tuberculosis] discussed the effects of occupants in unhealthy buildings. German municipal housing during the Weimar Republic (1923-31) experimented with *zeilenbau* [the row-house or terrace system] and *siedlungen* [colonies] as a measure of improvement. The "Weissenhof Siedlung" was the culmination of these model housing prototypes. In 1927 the Deutscher Werkbund, a German organisation founded in 1906 to promote design and industry, organised an exhibition in Stuttgart with the theme of *"Die Wohnung"* [The Dwelling]. (12) One of the conditions stipulated by the city council of Stuttgart for agreeing to finance the scheme was that the houses were to be available for sale once the exhibition was finished. This meant that the overall design, while demonstrating the potential of the new modernist environment, also required to have popular appeal. The architects involved in the design of these houses were among the principal exponents of modernist architectural thinking, such as Le Corbusier and Pierre Jeanneret from France, J. J. P. Oud and Mart Stam from The Netherlands and the German architects, Walter Gropius and Peter Behrens.

Behrens was determined to introduce a style of building which would provide all the healthy advantages of the individual house in a low-cost terrace form. "In order to make some impact on tuberculosis, it is apparent that every dwelling, even in a multi-storey building, needs to have a sizeable space open to the sky. It is no less necessary to ensure that all dwellings have thorough ventilation. The spaces which will represent roof gardens, must have enough depth to allow beds and other reclining furniture to be moved into the open and back into the apartment... "The Terraced Block" which I have projected is a conglomeration of houses of one, two, and three stories which are combined in such a way that the flat roof of the tower house forms the terrace for the house immediately above it."(13)

No dust, dirt nor bacteria could reside for long in the sparsely furnished functional interiors with their linoleum floors and painted, plastered and coved walls and ceilings. The resulting house types provided imaginative solutions for the demands of modernist styles of living and technology (14) and incorporated many of the *"Licht und Luft"* features, balconies, terraces, easy-to-clean working surfaces and sheet flooring. In 1933 *The Studio* included a report on an exhibition of "small economically-planned houses" which emphasised the "keynotes". These were "an effect of space, the avoidance of superfluous corners, planning for economy in housework, while the importance of light, air and sun is everywhere held in view." (15)

In America hygienic housing had different origins. Log cabins and clap-board houses

were the basis for the type of houses associated with the "simple life" movement.(16) This was promoted by Charles Wagner, a French Protestant minister and founder of the Union for Moral Action. In 1904 he undertook an American lecture tour at the behest of President Theodore Roosevelt who said of the pastor's publication, *The Simple Life* (1901), that he knew of "no other book which contains so much that we of America ought to take to our hearts".

The Simple Life: Theory and Practice, an Aesthetic of Economy: Gender implications, The Bungalow: Natural, Convenient, Cheap and Thoroughly Arts and Crafts, The Simple and Artistic Home: a Universal Goal and the associated dress-reform movement.(17) Ideas such as these were encouraged by the influential American magazine *The Craftsman* (18) which regularly included complete house plans and articles on the slum conditions in New York and progressive ideas on town planning. It emphasised the doctrine of "simplicity, honesty and attention to every environmental component" with the notion that "the philosophy of beauty" could also be "a means of social redemption" (19)

Early American Modernism was best defined in the Californian architecture of Irving Gill, Frank Lloyd Wright, Rudolf Schindler and Richard Neutra. It incorporated the individual desires of both architect and client to achieve artistic freedom on a grandiose scale combined with healthy living. During the early twentieth century, California was considered to be an area beneficial for tuberculosis sufferers, (for which the euphemism "health seekers" was often used). This was encouraged by the book *Climatology of the U.S.* (1859) in which the author Lorun Blodget recommended Southern California "as a place to live better and longer and prescribed it for those with consumption, asthma and rheumatism". Other books which supported this claim included *California for Health, Pleasure and Residence* (1872) by Charles Nordoff, *The Health Seekers of Southern California* (1870-1900) by John Baur and *California: Its Attractions for the Invalid, Tourist, Capitalist and Homeseeker* (1890) by Jerome Madden. In 1887 real estate agents were enjoying a boom time and by the turn of the century Los Angeles was regarded as "Capital of the Sanatorium Belt" with the districts of Pasadena-Sierra Madre (north), Riverside (east) and Santa Monica (west) having a reputation for being suitable for both "the comfortable and the consumptive".

An example of Southern Californian eccentricity was Dr Philip Lovell. He was a fiercely enthusiastic advocate of "nature cure", which involved drug-less medicine, exercise and diet in an attempt to provide a stress-free lifestyle. He promoted these ideas through his column "Care of the Body" in the *Los Angeles Times* and in "Dr Lovell's Physical Culture Centre". Lovell's ideas on healthy living coincided with those of the emigre Viennese architect Rudolph Schindler.(20) Schindler also contributed to Lovell's newspaper column, as in April 1926, when he wrote "Our high mechanical development easily controls our living conditions. Our knowledge about our own bodies releases us from slavery, and Nature becomes a friend. The house and dress of the future will give us control of our environment, without interfering with our mental and physical nakedness. Our rooms will descend close to the ground and the garden will become part of the house. The distinction between indoors and the out-of-doors will disappear.....(we) will sleep in the open". In 1924, for this most *avant-garde* client, Schindler designed a beach house. It had three distinct communal living spaces: the living area for family interaction, the garden court for play and the roof terrace for sunbathing, while the bedrooms provided any required privacy. It was the first of a number of "healthy" buildings of this period, which included the twelve-unit Pueblo Ribera community with sun-screened sleeping porches. Richard Neutra (1892-1970), another Viennese architect who had also settled in the United States,

acquired the disgruntled Dr Lovell as a client. Lovell was dissatisfied with Schindler's overspend on the Beach House, so for his town house in Hollywood, he chose Neutra to be his architect. The Lovell House was then known as the Health House (1928-29) . It "exercised a decisive influence over the rest of Neutra's career....The central theme of both Neutra's work and his writings *(Survival through Design)* was the beneficial impact of a well-designed environment upon the general health of the human nervous system....his so-called "bio-realism" rested largely on unproven arguments linking architectural form to overall health".(21)

However in Britain such progressive ideas were often officially resisted despite housing legislation (22) which indicated an awareness of need. The main cause of poor housing was land ownership and it was the alliance of Ebenezer Howard's theory of the Garden City with Unwin and Parker's practice which created what was in reality a middle class Garden City and Garden Suburb at Letchworth (1904) and at Hampstead (1906). The Tudor Walters Report (1918) was the first comprehensive treatise on the political, technical and practical issues which should be involved in the design of the small house. "Beauty" was all important.(23) It advocated "a sunny aspect for the living room, the bath on the ground floor, a store for food and one for fuel." The schemes which resulted from the passing of such legislation incorporated many "continental" features such as balconies. Anthony Bertram in his book *Design* (1938) which was based on a series of twelve broadcast talks *Design in Everyday Things* (1937) referred to the Times staff writer who remarked that "The balconies and every living room throughout the block will face the sun". (24) These were flats not tenements, as the term tenement carried derogatory connotations of over-crowding and insanitary conditions, in the 1920s and 1930s, when slum clearance schemes were being actively established by local authorities, there was also an increasing public awareness and interest in fresh-air and the beneficial, as well as fashionable, effects of sunshine.(25)

These improved housing schemes, together with the growing and eating of fresh vegetables produced in town allotments, (26) and the new invasive surgical techniques, such as artificial pneumothorax and the phrenic nerve crush, continued the steady improvement in the incidence and mortality statistics of tuberculosis (27) The influential and avant-garde Modern Architectural Research group (28) observed that rampant tuberculosis was synonymous with slum living. In 1938 the Quarry Hill municipal housing scheme, inspired by the socialist housing in Vienna, was designed by R.A.H. Livett, the City of Leeds Chief Architect. It was "the first housing scheme in Britain to bring together every strand of theory, function and idealism associated with the idealistic vision of CIAM". Livett was "inspired by an impressive sense of style, a social conscience and an informed knowledge of developments abroad" (29). Sun shelters for sunbathing were provided, but of even more significance, five per cent of this housing was provided with special large windows which could be folded open. This type of accommodation was allocated by the Medical Officer to tenants with tuberculosis. (30)

The arrival of Walter Gropius to England in 1934 gave the cause of modernism in Britain the philosophical charge it needed. During the 1930s modernist blocks of flats designed as an English version of *Existenzminimum*, (31) were built at Highpoint in Highgate (1935). They were organised and financed by housing associations and designed by radical architectural groups such as Tecton (32) and were occupied by middle class professional people. They incorporated the modernist features of flat roofs, balconies, sun terraces, smooth crevice free light-painted interiors and they were furnished with Isokon or similar modernist furniture. Many private houses were also commissioned by forward

thinking clients from the young modernist architects, where the benefits of the healthy life could be experienced.

Another modernist innovation was the butterfly house plan. "High and Over", which was designed in 1929-33 by the New Zealand architect Amyas Connell "was organised around a 'Y' shaped plan with three wings of accommodation radiating from a hexagonal hub." (34) The orientation was intended to take full advantage of the view and the available sunshine. As this plan has physical associations with the tuberculosis "pavilion plan", I challenge the generally accepted view that the inspiration for this was, as most architectural commentators state, "clearly with the white houses of the Mediterranean and the lucid and practical ideals of classical civilisation" (35) Where in vernacular Mediterranean architecture does one find the 'Y' or butterfly plan? Rather, the 'Y' plan or angled pavilion plan had been used since the Turban-Gros *Idealprojekt* (36) and was, by the 1920s, a well-established sanatorium layout used at Mount Vernon, Frimley and Zonnenstraal. Connell and Ward were not unaware of building for health requirements, as a number of health centres had been designed by the firm, though the locations of these if built, remain unknown. They were also very familiar with the work of European modernists and particularly the Dutch, Bijvoet and Duiker (37) Dudok and Oud. In 1936 the practice was commissioned to design a Preventorium (38) for the Papworth Community in Cambridgeshire. The design for the Preventorium reflected their aesthetic awareness of not only Duiker's Zonnenstraal, but also Aalto's Sanatorium at Paimio.

The requirements for outdoor living, *Licht und luft*, were flat roofs, balconies, terraces as well as summer houses, and *chaise longues* were also characteristic features of modernist architecture. The modernist interior consisted of spacious smooth surfaces, gloss paint, glazed tiles and linoleum and decorated in light, not white colours ranging from cream and beige to pale blue, greens and red-browns. Furniture was light and open in construction and easy to clean. The interiors were kept dust-free, due to use of electric power for heat and light and the invention of the vacuum cleaner in the first decade of the twentieth century. The housewife used pine polish and disinfectant or "O-Cedar Mop Oil" to maintain a dust-free hygienic house. Today we take for granted the Kleenex tissue and the paper cup, but these too have their origins in tuberculosis in response to the need for a disposable (incinerated) handkerchief and sputum cup.

A final example of modernist architecture, which was also a tuberculosis sanatorium, was the South West Finland Sanatorium at Paimio which is near Turku. Like the King's Sanatorium at Midhurst it was designed (1929-33) by a young progressive architect Alvar Aalto (1898-1966) as a result of a competition. Today it is still a working university hospital in which the architecture and the interiors are a living record of a period when there was still no cure for tuberculosis but 'hope' was expressed in the avant garde nature of the architecture and design of interior details.

Notes and References

1. The Napier Flats in Colinton Road were designed in 1934 by John Jerden (d 1947) and the concrete flats in Falcon Avenue were designed in1938 by John Ross MacKay (1884-1961).
2. Ravelston Gardens flats were designed in 1936 by Neil and Hurd (Robert Hurd 1905-1963).
3. The house was built by an Edinburgh business man in 1875 and was designed by John Chesser.

4. This is now the Hochgebirgsklinik which was founded in 1904-5, rebuilt in 1925-29 to designs by the Davos modernist architect Rudolph Gaberel (1882-1963).
5. See Bullock and Read, The Movement for housing reform in Germany and France 1840-1914, Cambridge, 1985, pp 354-355.
6. See *The Studio*, Vol 37, 1906.
7. ibid
8. ibid
9. The Fondation Rothschild did not build Rey's design as presented for the competition. They compromised by asking a group of the prize-winners to produce a collaborative scheme. See Bullock and Read, pp 404-405
10. See paper "Die Wohnung fur das Existenzminimum" [Minimal Living Housing] given by the German architect Ernst May to the Second Congress of CIAM held in Frankfurt in 1929.
11. Br Brauining "Wohnung und Tuberkulose", *Die Wohnung*, No 6, October 1927, p17.
12. The exhibition was in two parts, the housing development in the suburb of Weissenhof and materials, products and furnishings in a city centre exhibition hall.
13. Peter Behrens, in *Bau und Wohnung*, p 17.
14. See George H. Marcus, *Functionalist Design: An Ongoing History*, Munich/New York, 1995, Chapter "Standardisation" from p69. The Weissenhofseidlung was severely damaged during the Second World War but the overall character has been preserved.
15. See "Unit Houses", Vienna, *The Studio*, Vol CV, Jan-June, 1933, pp 155-156.
16. Cheryl Robertson *House and Home in the Arts and Crafts Era: Reforms for Simpler Living*, Kaplan 1986, pp336-357.
17. In the US the National Dress Association, (Reform was added later), was formalized at a convention in 1855. A leading member was the physician and hydropathist, Dr James C. Jackson. The movement maintained contact with enthusiasts through its journal *Sibyl* which was edited by Dr Lydia Hasbrouck. See McHenry, *Famous American Women*, New York, 1980. ref James C. Jackson M.D. *Consumption; How to prevent it and How to Cure it* Boston (1862).
18. Founded by Gustav Stickley in 1901 and published from 1901 to 1916 it extolled the virtues of "the simple life" and its subtitle was *An illustrated Monthly Magazine for the Simplification of Life.*
19. See Ornella Selvafolta *The Simplification of Life*
20. See the Vacation house at Newport Beach (1922-5) and refer to sub-section "Balconies and Sleeping porches".
21. See Kenneth Frampton *Modern Architecture* (1920-1945), New York, 1983.
22. Tudor Walters Report (1918), The Housing and Town Planning Act, (1919), The Housing Act, (1923 & 1924) The Slum Clearance Act (1930) and the Housing Act (1936).
23. Nuttgens 1989 complete.
24. See Anthony Bertram, *Design*, London, 1938, chapter 3, Housing the workers in England. See also the *Times*, 19 July 1935, p11c.
25. The French fashion designer 'Coco' Chanel actively promoted suntan *'bronzage'* as a fashion accessory.
26. The 1908 Allotments Act provided the legislation for modern allotment law in that local authorities were required to provide land for plots. The allotment movement was a reaction to the Enclosure Acts of the 18th and 19th centuries. Allotments were a form of compensation for the landless poor, specifically to provide a source of

cheap food and open-air recreation for the urban working class. The National Society of Allotment and Leisure Gardeners was founded in 1905. Allotments were also started in 1917 for men returning from the war. Other countries such as Denmark (Garden Colonies) also had allotment schemes. In Edinburgh the social reformer and town planner Patrick Geddes (1857-1932) introduced the concept of gardening as an environmental improvement in the Castlehill Johnston Terrace area of the inner Old Town.

27. After the Second World War there was a marked increase due to the overall poor state of immune resistance of a war deprived population.
28. Founder members of the MARS group in 1933 included Wells Coates, Serge Chermayeff, Howard Robertson and Jack Pritchard.
29. See Peter Mitchell, *Memento Mori The Flats at Quarry Hill Leeds*, Otley, 198?. These flats were demolished in the late 1970s.
30. From *Modernism in Design*, see Julian Holder, *Promoting Modernism in Britain*, London, 1990.
31. See Open University A 305, Arts: Third Level Course, History of Architecture and Design 1890-1939. Unit 18.
32. The architects Berthold Lubetkin and E. Maxwell Fry.
33. It was designed by the New Zealand architect Amyas Connell for Bernard Ashmole, Professor of Classical Archaeology at the University of London and Director of the British School in Rome, and is in Amersham, Buckinghamshire.
34. See Dennis Sharp, *Connell, Ward and Lucas, Modern Movement Architects in England 1929-1939*, London, 1994, pp 26-27.
35. See Dennis Sharp ed, *Connell, Ward and Lucas, Modern Movement Architects in England 1929-1939*, London 1994.
36. See Section 1, The Sanatorium Movement, Dr Karl Turban and Davos.
37. Duiker's Zonnenstraal, a star-pavilion plan, was designed and built before 1929.
38. A "preventorium" was an alternative term for a sanatorium, more commonly used in the United States.

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This meeting brought the 1997-1998 Session of the Society to a close.

On 18th March 1994 the Society held its One Hundred and Forty First meeting, at the Kelvin Conference Centre of the University of Glasgow. Two papers were presented at that meeting. The Society's Proceedings of 1992-3/1993-4 contained the first paper, one by Dr J. F. McHarg on William Harvey's historic study of Hugh Montgomery's heart but not the second paper, by Mrs Brenda White, on Murder in the University.

This omission is now rectified by the inclusion of Mrs White's paper

MURDER IN THE UNIVERSITY

The subject of my paper is Forensic medicine. Your President encouraged me to "make it really grisly so that we can all enjoy it" and thus the particular aspect that I will explore is Murder. I want to look at the period from 1890 to 1945, when professors of forensic medicine enjoyed enormous prestige as complete medical detectives. During this period they extended the boundaries of knowledge in serology, toxicology, wounds, hairs and fibres and ballistics where they impinged on murder. Thereafter, most of these categories became specialisms and moved out of medical hands into branches of forensic science. I cannot use all the cases involved, but have centred on the better known ones. Some are very well known indeed.

Before moving on to the "grisly bits", such as they are, homage must first be paid to two of Scotland's early figures in forensic medicine, Andrew Duncan senior, who introduced the subject into British university teaching, and Robert Christison who did much to improve standards and methodology. Andrew Duncan senior, is really the father of forensic medicine in Britain. He taught many of the later protagonists such as John Gordon Smith, Edward Male, and Beck, all of whom paid handsome tributes to his teaching and influence. Duncan senior, was professor of the Institutes of Medicine at Edinburgh and he introduced forensic medicine into his classes in the 1790s. He was responsible for the foundation of the first British chair of medical jurisprudence at Edinburgh in 1806, with the first incumbent being his son, Andrew Duncan junior.

Robert Christison was the third professor of forensic medicine at Edinburgh, from 1819-1825. It was his first academic position and a stepping stone to greater things. His main interest was toxicology and his textbook "A Treatise on Poisons" served medical teaching for decades, going into 5 editions. He appeared for the Crown in many of the great trials, such as that of Madeleine Smith. He was also the co-author, with Syme and Watson, of a small pamphlet on the methodology of post-mortem examination, the principles of which, I am told, still stand today. The pamphlet was written to inform doctors and lawyers so that sheriffs and procurators fiscal knew what to look for when post mortem examinations were called for. It standardised the method and gave all doctors a clearer vision of what was expected of their courtroom evidence. As medical and scientific knowledge increased during the 19th century, forensic medicine was taught by men who were used to courtroom confrontations. Their appearance in court was a direct result of forensic work carried out in university based laboratories. By the end of the century professors of forensic medicine were well known public figures who considered themselves

experts in death by wounding, shooting, strangulation, poison and other exotic methods.

There can be no better example of forensic medicine's progress in the latter half of the 19th century than Edinburgh's Henry Duncan Littlejohn. Littlejohn is important because he bestrode Edinburgh for the best part of 50 years and his period in public office covered a transitional stage in forensic medicine. When he set out in 1854 as Edinburgh's police surgeon, medical and scientific knowledge was still extremely limited. When he retired as professor in 1908 the medical experts were indeed medical detectives of a heroic mould best illustrated by the fictitious character of Sherlock Holmes.

Holmes was not a doctor but his creator, Sir Arthur Conan Doyle was. As is well known, Holmes himself was modelled on two of Doyle's teachers, the great surgeon Dr Joseph Bell and Henry Littlejohn. Bell was a master of observation and gave Holmes his omniscient pronouncements on mysterious visitors, "I see you are a military gentleman recently returned from the Orient" kind of thing. But it was Littlejohn who inspired Doyle's criminal cases. Littlejohn worked on gunshots, wounds, poisoning, and other aspects of forensic science.

In 1893 gunshots brought him into the Ardlamont murder case. Alfred Monson stood trial for the murder his young pupil, 20 year old Cecil Hambrough, by shooting him at Ardlamont House in Argyll. The Ardlamont case, illustrates the strengths and weaknesses of medico-legal knowledge at the time. The GP who examined Hambrough's body had only seen a gunshot wound once before, and that was to the hand. The doctor issued a death certificate immediately, but later became suspicious when he learned that Mrs Monson held large insurance policies on young Hambrough's life. He informed the Procurator Fiscal and the body was exhumed from its grave in Ventnor on the Isle of Wight. Littlejohn appeared for the Crown, but Monson's defence called on Matthew Hay, Professor of Forensic Medicine at Aberdeen University, who ruled the North East Scotland circuit. Hay was also Aberdeen's police surgeon and MOH.

The two medical experts put forward equally cogent reasons for Monson's guilt or innocence by measuring the fatal shot's trajectory and its impact on Hambrough's skull. Great emphasis was placed on the line of fire from pellet marks on tree trunks, even broken twigs and leaves were brought into the deliberations. The trial remains a classic example of interpretation of the evidence and it confused the jury enough to deliver a Not Proven verdict.

Until the closing years of the 19th century, Glasgow professors of forensic medicine played little part in court proceedings although the city's criminal statistics were the highest in Scotland and were well up the British scale. In 1898 John Glaister was appointed fourth professor of forensic medicine in the university. He was then police surgeon for the city and lecturer on forensic medicine and public health in St Mungo's medical school in the GRI. Glaister's first taste of national limelight was in the celebrated case of Oscar Slater in 1908. Together with Henry Littlejohn, he appeared for the Crown when Slater was accused of the murder of Marion Gilchrist in the dining room of her respectable home in Glasgow's west end. Marion Gilchrist suffered appalling head injuries, her head being beaten to a pulp with a blunt instrument. The murderer was seen when her maid and a downstairs neighbour entered the flat after hearing noises, but he fled before they realised a crime had been committed. A diamond brooch was missing and was mistakenly traced to Oscar Slater, a shady German Jew who lived off the earnings of his mistress. Slater and the woman fled to America. The American police were alerted by telegraph and Slater was detained on arrival and his baggage impounded. He agreed to return to Scotland to prove his innocence. Amongst his baggage were a small hammer and a stained raincoat.

Glaister was called into the case and carried out the post-mortem on Marion Gilchrist. When Slater returned to Scotland both Glaister and Littlejohn worked on the hammer and the raincoat looking for bloodstains. Forensic science had reached the point where it could distinguish blood from paint and rust, and was on the brink of further differentiating human blood from that of other mammals. Glaister was firmly convinced that the small hammer fitted the wounds on the victim's face and head, but could not find enough blood on either the hammer or the coat to identify positively the stains as blood. Slater was convicted on the grounds of personal identification by witnesses and sentenced to death. He was reprieved after an outcry but he served 26 years before being released on the grounds of misdirection by the judge in his summing up to the jury and being given £6,000 compensation.

In forensic terms the Slater case dealt with wounds and blood. Blood, or serology, claimed Glaister's interest and he was eventually able to establish, in Scottish courts of law, that doctors could tell the difference between human blood and that of other mammals. This was difficult. Judges, lawyers and juries were reluctant to hang a prisoner solely on the evidence of medical science, which appeared at times to be changing by the year and there were to be many cases before tests for human blood were finally accepted.

Glaister was helped in his work by his son, John Glaister junior, who eventually succeeded him in the Glasgow chair in 1932. Glaister junior tackled the task of introducing a teamwork approach in forensic enquiries. His own research into human blood and into hairs and fibres made him realise that forensic science was now too complicated for one man to claim it all as his own. The first real example of forensic medicine and science as we know it today came with the murder of a young Aberdeen girl, Helen Priestly in 1934 by a neighbour Mrs Donald, who put the body in a sack and left it in the tenement lobby. The case is usually called the Aberdeen Sack Case. There had been bad feeling between the Donald and the Priestly families. Helen gave cheek to Mrs Donald who hit her. The child lost consciousness and Mrs Donald then simulated rape with an instrument, to throw suspicion onto a man. The child then woke up and screamed. Mrs Donald then either strangled the child or the child inhaled vomit and asphyxiated. The tenement was searched. Mrs Donald waited until the panic had died down and then put the child's body in a sack in the lobby. Suspicion fell immediately on Mr and Mrs Priestly who were removed to prison. The flat was searched for links between child, sack and the accused couple. However, Mr Priestly had an alibi which held and he was released from custody.

Many experts were called in and Sydney Smith from Edinburgh was the main medical witness. With no witnesses to the crime, the major reasons for Mrs Donald's eventual conviction were that Sydney Smith linked bacteria found in the child's intestines and underclothing to those found in a washing cloth in the Donald's flat. Glaister, called to examine hairs and fibres found inside the sack, discovered hairs with a striking similarity to Mrs Donald's permed hair. The painstaking investigation of all the household was carried out in the University laboratories of Glasgow and Edinburgh by forensic pathologists and scientists. Co-operation on such a scale provided the answer to what appeared an insoluble crime.

Though not on the same scale as the latest puzzle for forensic pathologist, Bernard Knight and his colleagues, of the murders by Frederick West at Cromwell Road, Gloucester, the case of Buck Ruxton imposed tremendous strains on forensic knowledge in 1937. The strain was met with ingenuity and co-operation from pathologists, anatomists, scientists, dental experts, and entomologists and introduced techniques using photography

and plastic reconstruction modelling which, though now greatly enhanced, are standard practice today. The case became a tour-de-force annual lecture by Glaister to his students of medicine and law. I have met some of them, who still recall the experience with awe. The Ruxton murder was committed and tried in England, but was solved mainly by Scottish forensic doctors and scientists.

Buck Ruxton murdered the mother of his two children, and their maid, Mary Rogerson at their Lancaster home. He cut up their bodies in the bathroom, removing all teeth and identifying marks. He sliced off a large piece of flesh with a birthmark from Mary Rogerson's arm and a bunion from Mrs Ruxton's foot. He eviscerated both bodies and then burned what he could in the back yard. He then wrapped the remains in parcels covered by articles of clothing, sheeting and newspapers, drove to Moffat by the A74, then threw some of them over a bridge and hurled the others into nearby ditches. The river was in spate and carried its gruesome parcels downstream. They began to turn up, scattered over a wide area, after two weeks had elapsed, bit by bit.

Mrs Ruxton's foot was found by workmen who were joking about not picking up parcels because of what they might contain. Ruxton's mistake was to wrap the parcels in local newspapers, which were traced to Lancaster where the two women were already posted as missing, in sheeting which a textile manufacturer was able to trace back to Ruxton, and in clothing traced back to Rogerson. The entire bathroom was taken to the forensic medicine department at Glasgow University in a large furniture van and reconstructed. There, Glaister applied his serology skills using precipitin tests to detect large quantities of human blood. Professor Brash, of the Anatomy Department of Edinburgh University had the grim task of piecing the bodies together. In the absence of distinguishing features and because of surgical dismemberment this proved difficult and it was thought that the bodies were of a man and a woman until three female breasts were discovered. Towards the end of the investigation Sidney Smith arrived home from his travels and laid claim to some of the events, though from his memoirs his delayed role did not detract from the value of his activities. Dental details emerged when reconstruction experts detected old extractions and wisdom teeth which had not erupted. Entomologists estimated the time of death from larvae found in the remains. With immense care, Detective Sergeant Bertie Hammond of the Glasgow police was able to take finger and palm prints from the wrinkled left hand of Mrs Ruxton's body which matched prints taken from the house, and a thumbprint from the dermis of Rogerson's hand, with sufficient whorls to make a positive identification.

However, the outstanding feature of the case was Brash's reconstruction of Mrs Ruxton's face where concise measurements were needed to show how well the skull aligned with a portrait. Similar accuracy was shown in the plastic reconstruction moulding of the severed feet which fitted shoes worn by the women. Ruxton was tried and found guilty almost entirely on the medical and scientific evidence ranged against him and he was hanged.

With such concentration on specific skills the days of the single medical detective were numbered. One by one, specialisms became too detailed for busy forensic teachers and were hived off to experts in their own right. Ballistics gradually became a police function in the same way that fingerprints were. From childhood, the younger Glaister wanted to tread the boards and thought of himself as a writer and in later life he was able to realize these dreams when his great moments were made into a television series entitled "Glaister". Further media triumphs followed when he advised his nephew Gerald Glaister, on the series "The Expert" starring Marius Goring.

The Scottish Society of the History of Medicine

CONSTITUTION.

1. The Society shall be called "THE SCOTTISH SOCIETY OF THE HISTORY OF MEDICINE," and shall consist of those who desire to promote the study of the History of Medicine.

2. A General Meeting of Members shall be held once a year to receive a report and to elect Office-Bearers.

3. The management of the affairs of the Society shall be vested in the Office-Bearers, who shall include a President, one or more Vice-Presidents, a Secretary, a Treasurer, and not more than ten other Members to form a Council. The Council shall have power to co-opt other Members who, in their opinion, are fitted to render special service to the Society.

4. All Office-Bearers shall be elected annually. The President shall not hold office for more than three successive years, but shall be eligible to serve again after one year. Not more than eight Members of Council, or two-thirds of the total number, shall be eligible for immediate re-election.

5. The Annual Subscription shall be fixed from time to time by the Council and reported to members of the Society.

6. The Secretary shall keep brief Minutes of the proceedings, shall prepare Agenda, and shall conduct the correspondence of the Society.

7. Meetings shall be held at least twice yearly, and the place of meeting shall be in any of the four University centres, or elsewhere, as the Council may decide.

8. This Constitution may be amended at any General Meeting of the Society on twenty-one-days' notice of the proposed amendment being given by the Secretary, such amendment to be included in the Agenda circulated for the Meeting.

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