The Scottish Society of the History of Medicine

(Founded April, 1948)

REPORT OF
PROCEEDINGS

SESSION 1990 - 91 and 1991 - 92

The Scottish Society of the History of Medicine

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THE FORTY SECOND ANNUAL GENERAL MEETING

The Forty Second Annual General Meeting was held in the Jardine Day Hospital of the Royal Edinburgh Hospital on 10th November 1990. It was attended by 62 members or guests and the President, Professor David Waddell, was in the chair. The minutes of the Forty First Meeting were approved and the Treasurer's report accepted. Two grants had been made from the Guthrie Trust. These were £500 to Professor Girdwood to assist with the publication of his book, "Travels with a Stethoscope" and £500 towards the work of the Soutra Hospital Project.

The following Office Bearers were elected; President, Mr. John Blair; Vice-Presidents, Prof. D. A. G. Waddell and Dr. Elizabeth Rose; Treasurer, Dr. Martin Eastwood; Auditor, Dr. N. H. Gordon; Honorary Secretaries, Miss Fiona Watson and Mrs. Brenda White; Editor of Proceedings, Dr. David Wright. Three new council members were elected, Dr. Mark Fraser, Dr. Stuart McGowan and Dr. Alastair Masson, to replace Prof. Bernard Lennox, Dr. Sheila Milne, Dr. Stalker and Dr. Scott Wilson, whose terms of office had expired. The outgoing members were warmly thanked for their contributions.

THE ONE HUNDRED AND THIRTY FIRST ORDINARY MEETING

This meeting directly followed the Forty Second Annual General Meeting at the Royal Edinburgh Hospital. The President, Mr. J. S. G. Blair, introduced Dr. Alan Beveridge who talked on Robert Fergusson.

ROBERT FERGUSSON'S ILLNESS REVISITED

Two episodes towards the end of the 18th Century - one national, one local – greatly affected people's attitudes to mental illness. The national event concerned George III. In 1788 the King went mad. As a result people's view of madness slowly changed. The old view of insanity as a state akin to bestiality had to be revised when it was seen that the highest in the land was subject to mental derangement. The local event concerned Edinburgh's greatest poet, Robert Fergusson, who died in the city bedlam in 1774 at the age of 24. It was Fergusson's tragic death that led Dr. Andrew Duncan to campaign for an asylum to be built in Edinburgh – a campaign that led to the creation of Royal Edinburgh Hospital.

While George III's illness has been admirably documented by Hunter and MacAlpine, (1) Robert Fergusson has suffered comparative neglect. He has often been ill-served by his biographers who have seen his short, tragic life in terms of a moral parable, illustrating the sin of dissipation. The myth of 'the poor, white-faced, drunken, vicious boy that raved himself to death in the Edinburgh madhouse' – as Robert Louis Stevenson (2) put it – has frequently been repeated uncritically in later accounts of his life. However, an examination of the available facts concerning Fergusson's last days suggests a rather different explanation for his early demise which I hope to show. Firstly I will briefly describe Fergusson's background. Secondly I will detail the events of his last days and thirdly I will look at the various explanations for his illness.

Brief Biographical Sketch

Robert Fergusson was born on 5th September, 1750 in the Cap-and-Feather Close, a narrow alley off the High Street. His parents had moved from Tarland, in Aberdeenshire, two years earlier. His father, William, who was said to have had some literary talent, worked in a succession of low paid clerking jobs. There were five children, although one son died in infancy. Significantly there is no evidence that any of Fergusson's immediate family suffered from mental illness. Biographers are agreed that Fergusson was a sickly child. For example Gleig (3) wrote:

'During the years of infancy and childhood the constitution of our poet was so weak that little hopes were entertained of his arriving at manhood'.

Fergusson was initially taught in a private school in Niddry's Wynd before attending the Edinburgh High School. Obtaining a bursary he spent two years at Dundee Grammar School until at the age of 14 he enrolled at St. Andrews University. Accounts of his time there portray Fergusson as a lively, intelligent student much given to practical joking and writing comic verses. Fergusson left St. Andrews in May, 1768 without formally graduating - this was very common in the 18th Century as it cost money to graduate. He returned to Edinburgh to find his family's circumstances changed. His father had died in 1767, his elder brother Harry had joined the Navy to escape from 'his past follies' as one biographer (4) put it, and his sister Barbara was married. To provide for his mother and younger sister Fergusson was compelled to accept the dull, monotonous work of a copying clerk in the Commissary Office, transcribing papers at the rate of a penny a page.

Fergusson had been writing poetry ever since his student days and his poems now began to be published, appearing in 'The Weekly Magazine' from 1771 onwards. A volume of poetry appearing in 1773 was warmly received (5).

Fergusson was now partaking in the social life of Edinburgh – that 'hotbed of genius' as Smollett (6) had dubbed the Capital, where the leading figures of the Scottish Enlightenment enjoyed 'a familiar fraternity' in the clubs and taverns of the City (7). Fergusson himself was a member of the Cape Club which attracted a wide spectrum of Edinburgh society – and his company was eagerly sought. Fergusson's first biographer, Thomas Ruddiman has left this engaging portrait:

'For social life he possessed an amazing variety of qualifications... he was always sprightly, always entertaining . . . When seated with some select companions . . . his wit flashed like lightning, struck the heavens irresistibly, and set the table in a roar' (8).

Thus at the time when illness struck in 1773 Fergusson was writing the most innovative and powerful poetry of the day in Scotland and cutting a popular figure in the social life of the Capital.

Robert Fergusson's Illness:

In considering Robert Fergusson's illness we should bear in mind the three commonest explanations that have been put forward. Firstly that he suffered from venereal disease. Secondly that he was a drunkard and thirdly he suffered from a manic depressive illness.

Robert Fergusson's illness falls into two distinct phases. The first phase appears to have begun in October of 1773. The first indication we have is from a letter Fergusson wrote to his friend in which he states:

'The town is dull at present; I am thoroughly idle, and that fancy which has so often afforded me pleasure almost denies to operate but on the gloomiest subjects' (9).

Fergusson's gloom continued and in a second letter of November, 26th Fergusson writes:

'When teased with vapours urged with spleen,
And clouds of gloomy thoughts conveen;
When youthful blood, once child of fun,
Weeps o'er the mirthful glass that's run.' (10)

Acquaintances found him to be much more preoccupied. By 30th December, 1773 Fergusson had been forced to give up his duties as a clerk in the Commissary Office. By February of the following year, 1773, he made a brief recovery but unfortunately took part in some festivities during the Fife elections. This had disastrous consequences. According to Peterkin's 1807 biography:

'While his physical system was under the influence of medicine, for his recovery from the consequences of ebriety and folly, he was unfortunately enticed to accompany some gentlemen, who were interested in an election business. On this expedition he was much exposed to the riotous enjoyments incident to health, produced a feverishness and decrepitude of mind amounting nearly to insanity' (11).

From this stage – February, 1774 – until July of that year Fergusson underwent mental and physical deterioration. He was noted to be 'emaciated' (12), 'sleep now forsook his eyelids' (13) and he became a social recluse. He became preoccupied with religion and the study of the Bible. His grasp of reality was weakened. He informed his friend, William Wood, the actor whom he met one day below the North Bridge that 'he had just discovered one of the reprobates who had crucified our Saviour, and that in order to have him disposed of according to law, he was making all possible haste to lodge the information with Lord Kames' (14). To others Fergusson claimed that he had been decapitated in a sword fight but had managed to replace his head on his body with no ill effects (15). However, Fergusson recovered from this episode and by early July 'his health was completely restored' (16). That completes what we know of the first phase of Fergusson's illness. Following his recovery he once again took up his social activities but tragically he met with an accident which led to a second and this time fatal episode of illness.

The Second Phase

On 28th July the 'Caledonian Mercury', an Edinburgh newspaper, reported that Robert Fergusson 'had been seized with a very dangerous illness' (17). According to Thomas Sommers, his friend and biographer:

'. . . he was one evening taking a glass with a few friends, and had the misfortune to fall from a staircase, by which he received a violent contusion on the head . . . he could give no account by what means he met with the accident, being in a state of total insensibility' (18).

Fergusson stayed for two weeks at his mother's house where he remained confused. It was at this point that he was visited by Dr. Andrew Duncan, a visit which was to have a profound impression on Duncan. Andrew Duncan was then 29 years old. In later years he was to become President of the Royal College of Physicians and Professor of the Institutes of Medicine. Among his many interests he had a penchant for writing occasional verse. 50 years after meeting Fergusson he wrote this account:

'. . . I was requested to visit the late Mr. Robert Fergusson, well known to his countrymen as a Scottish poet of no mean abilities. I found him in a very deplorable condition, subjected to furious insanity. He lived in the house of his mother, an old widow, in very narrow circumstances. Her feeble and aged state, the situation of her dwelling-house, and several other circumstances rendered it impossible to make any attempts towards his cure, with the slightest prospect of advantage, while he remained at home. After several fruitless attempts to have him placed in a more desirable situation he was at last removed to the Bedlam of the City of Edinburgh' (19).

We have been left a detailed account of Fergusson's first few days in the bedlam by Thomas Sommers.

'During the first night of his confinement, he slept none; and when the keeper visited him in the morning, he found him walking along the stone floor of his cell, with his arms folded, and in sullen sadness uttering not a word. After some minutes silence, he clapped his right hand on his forehead, and complained much of pain... In the afternoon his mother and elder sister called upon him, found him in a state of composure, and conversed with him for a considerable time' (20).

Fergusson was under the care of Dr. Alexander Wood, who was in charge of the medical department of the Edinburgh poor-house and of the bedlam attached to it. 'Lang Sandy Wood', as he was known to his contemporaries, was a respected surgeon and something of an eccentric. He apparently went to visit his patients, accompanied by a pet sheep and a raven. He was a friend of Andrew Duncan and Duncan continued to visit Fergusson until his death.

Fergusson's condition fluctuated and 'his friends were permitted to see him in his lucid intervals' (21). Fergusson spent two months in the bedlam. The next accounts we have of him concern his last days. His friend Sommers accompanied by an Edinburgh surgeon, Dr. John Aitken, visited him a few days before he died. It is quite clear that at this point Fergusson was perfectly lucid:

'We walked backward and forward along the court, conversing for nearly an hour. In the course of which, many questions were asked at him both by the Doctor and myself, to

which he returned most satisfactory answers . . . I asked him what hour of the day it might be? . . . (He) said, it was within five minutes of twelve. The Doctor looked at his watch and exclaimed, 'It is just six minutes from twelve!' (22).

Fergusson's mother and sister visited him a few days before he died and found him 'calm and seemingly collected' (23). Then on 17th October, 1774 Fergusson died in his cell. With tragic irony we learn that Fergusson's mother had received money from her other son Harry with which she hoped to provide the means for having him cared for at home.

The Edinburgh City Bedlam

Before looking at the various explanations for Fergusson's illness I would like to briefly consider the Edinburgh City bedlam. What were the conditions in which Fergusson spent the last two months of his life? 'Deplorable' was the word Andrew Duncan (24) had used to describe facilities for the poor and mentally disturbed in the Capital. The Royal Infirmary refused to accept insane patients, although the original plans for the hospital had included a ward for such patients. The mentally disturbed amongst the upper classes could be catered for in private madhouses or kept at home. For example Boswell's brother, John, suffered from recurrent bouts of insanity but because he was the son of Lord Auchinleck, funds were available to pay for a private madhouse. However, for the poor and deranged the only facilities available were the bedlams, work-houses and bridewells. Despite Roy Porter's (25) warning against simplistic, blanket condemnations of the 18th Century treatment of the insane, the plight of the mentally disturbed in Scotland does seem distinctly woeful. Andrew Duncan (26) had called the situation 'a national disgrace'. In the whole of Scotland there was as yet no public asylum. For Fergusson then with his impoverished background the only facility available for him was the Edinburgh City bedlam.

The City bedlam was situated in the same grounds as the charity work-house and the house of correction. It lay in what is now the triangle formed by Bristo Street, Teviot Road and Forrest Road. The bedlam contained 21 cells for lunatics and was known popularly as The Cells. Outside the bedlam ran the massive town wall (27). One visitor, a Dr. Halliday, described the inmates he saw:

'It is impossible for language to depict their wretched state. We found fifty-four individuals in that abode of misery, two thirds of them females. Many had scarcely a sufficiency of rags to cover their nakedness, and even the shreds that remained appeared not be have been cleansed of their impurities for months. In a distant cell we discovered a woman, worn out by the violence of the disease, stretched upon a straw pallet, and sinking rapidly to the grave. A rat was perched upon her bed' (28).

As late as 1826 a female patient was being chained to a tree in the bedlam grounds and upsetting the good citizens of Edinburgh with her screams. Fergusson himself complained bitterly about the cold and the generally unhealthy environment must have greatly reduced his chances of recovery.

The Nature of Fergusson's Illness

If we now consider the explanations for Fergusson's illness. Firstly the suggestion that he suffered from venereal disease. It seems quite probable Fergusson did in fact suffer from some form of venereal disease in his last years. Alexander Peterkin makes the first,

albeit veiled, reference to the subject in his 1807 biography. According to Peterkin (29) Fergusson suffered from 'the unfortunate complaint' and he 'indulged in the gratification of animal passion until his hapless career was closed in madness'. A later biographer, Robert Chambers (30), wrote that Fergusson 'caught the baneful distemper, the effects of which were quite as much mental as physical'.

In Edinburgh in 1770 venereal disease accounted for over a quarter of the diagnoses recorded in the general register of the Royal Infirmary, according to Gunter Risse (31) in his recent book on the hospital. Prostitution increased dramatically in the 1770s. Leading Edinburgh doctors such as William Cullen and Benjamin Bell concerned themselves with the subject of venereal disease. In 1793 Benjamin Bell (32) published his influential 'Treatise on Gonorrhoea Virulenta and Lues Venerea'. Tobias Smollett (33), a doctor and a novelist, had his fictional doctor in 'Humphry Clinker' describe the worst symptoms 'nodi, tophi, and gummata, veruccae, cristae Galli and a serpiginous eruption, or rather a pocky itch all over'.

It is impossible to know whether Fergusson suffered such physical ailments. Later biographers make no mention of such symptoms but again it is unlikely that such explicit troubles would be described in early 19th Century accounts. Interestingly however, Fergusson's difficulties bear some resemblance to Benjamin Bell's (34) account of the disease:

'Irritability and restlessness are two symptoms of this disease. The patient becomes fretful and uneasy and his nights are spent in watching'.

A contemporary account of the sufferer's experience of venereal disease has been left by James Boswell (35), biographer of Johnston, native of Edinburgh, and oft-times victim of 'the perils of Venus'. Like Fergusson Boswell withdrew from the social whirl of city life and experienced feelings of despair, despondency and remorse. His gloom took on a religious aspect and he felt, like Fergusson, that he was a sinner.

If Fergusson was suffering from some form of venereal disease – and it seems at least possible – what treatment would he have received? The mainstay of therapy at this time was mercury. We know that Fergusson was taking 'medicine' for 'his recovery from the consequences of ebriety and folly' (36) – a description itself which strongly suggests that the treatment was for venereal disease. This suggestion is further strengthened by Robert Chambers' (37) account of Fergusson being 'exposed by the effects of a certain medicine to cold'. Mercury increased an individual's susceptibility to cold as Andrew Duncan (38) had stated in his 'Observations on the Use of Mercury'. Duncan wrote: (39) 'It is an undoubted fact that no medicine rends the body more susceptible of injury from cold than mercury'.

We know that Fergusson suffered a deterioration following a bout of revelling whilst on medicine. As Duncan (40) warned:

'Wine and spirits of all kinds are, from their stimulant quality, if not to be totally forbid at least to be used sparingly'.

So a good case can be made for the diagnosis of venereal disease.

Was Fergusson an Alcoholic?

Was Fergusson also a drunkard? The 18th Century is notorious as a time of drunken excess. Drunkenness was rife and alcohol was cheap. Enlightenment Edinburgh did its fair share of drinking and as Chambers related (41):

'Tavern dissipation formerly prevailed in Edinburgh to an incredible extent, and engrossed the leisure hours of all professional men, scarcely excepting even the most stern and dignified. Nothing was so common in the morning as to meet men of high rank and official dignity reeling home from a close in the High Street where they had spent the night in drinking'.

Tradition has associated Fergusson with excessive alcoholic indulgence. Pinkerton (42) in his 1786 biography felt that Fergusson's ailments sprang from his fondness for 'a bowl of punch'. David Irving (43) self-righteously inveighed against Fergusson's 'perpetual dissipation' while the novelist Henry McKenzie (44) wrote, 'Fergusson, dissipated and drunken died in early life'. Robert Louis Stevenson (45) wrote of 'the white-faced, drunken, vicious boy' and more recently Professor Smout (46) has described Fergusson as 'the dissipated son of an Edinburgh clerk who died in 1774 at the understandably early age of twenty-four'.

Was Fergusson then a perpetual drunkard? The answer would seem to be no. His friend Thomas Sommers, who knew Fergusson well, vigorously denied such charges in his 1803 biography (47):

'I passed many happy hours with him, not in dissipation and folly but in useful conversation. He preserved a modesty and gentleness of manners'.

Robert Chambers (48) who communicated with a friend of Fergusson's concluded that 'the poor poet indulged exactly in the same way, in general to the same extent, as other young men of the day'. Chambers' informant makes the important point that Fergusson, even if he had wished to over-indulge, did not have the money to finance repeated heavy bouts of drinking. Fergusson at this time was drawing a small wage as a clerk and had to support his mother and sister. Fergusson wrote over 70 poems in his short life and he would have hardly been able to be so prolific if he was repeatedly over-imbibing. As well as his impressive poetic output he was also working regularly as a clerk in the Commissary's office until the end of 1773. Like his successor Robert Burns, it seems that Fergusson has undeservedly attracted the charge of alcoholic excess.

Was Fergusson Suffering from a Depressive Illness?

Was Fergusson suffering from depression? In the only medical interpretation of Fergusson's symptoms previously undertaken, Dr. Chalmers Davidson (49) has suggested that Fergusson suffered from a manic depressive psychosis of the depressed type. Certainly there are abundant references to Fergusson's low spirits in his final months. His last poems, 'My Last Will' and 'Codicile' concern themselves with morbid subjects while his poem 'To My Auld Breeks' confesses to sadness behind the social facade. One of his last poems 'Ode to Horror' speaks of despondency.

'O Thou with incessant gloom
Court's the recess of midnight tomb!
Admit me of thy mournful throng,
The scatter'd woods and wilds among.

It is of course dangerous to assume that a poet's lines are a direct reflection of his mood. The mid 18th Century has after all been called 'the age of melancholy' (50) and poets frequently concerned themselves with the subject of the vapours or spleen. The term 'the English malady' coined by the Scottish doctor George Cheyne (51) was used to characterise what was thought to be the English susceptibility to lowness of spirits. Fergusson was thus writing in the popular tradition of his time. However, even given the cultural influence on his poetic themes, there does appears to be a definite change in his poetry from the lively, exuberant, humorous verses of his earlier works to the pessimistic, morbid and dejected lines of his last months.

However there are problems with the suggestion that Fergusson had a depressive illness. Examining the accounts of his illness one is struck by the fluctuation in his symptoms. From the Autumn of 1773 until early 1774 he was intermittently in low spirits as his two letters I have quoted from this period suggest. However, he continued to write poetry and to work indicating that he was obviously still quite rational and lucid.

By early 1774 Fergusson felt sufficiently gregarious to take part in the electioneering festivities in Fife. His revelling whilst under the influence of medicine led to a deterioration in his health. The nature of his symptoms changed dramatically from the complaints of mild despondency of the previous Autumn. He does not sleep, becomes a social recluse and his former exuberance changes to religious fervour. For the first time his grasp of reality becomes tenuous – he believes he has discovered one of Christ's assassins and also that he has been decapitated in a street fight. Physical signs are also noted – he was 'very poorly', subject to 'feverishness' (52) and 'emaciated' (53). It seems that by this time – between February and July of 1774 Fergusson was floridly ill; he was subject to fleeting, bizarre delusions, melancholic in mood, emaciated in body and feverish in constitution. All this strongly suggests that Fergusson was in the throes of an acute confusional state, and the most obvious cause would appear to be the combination of medicine and alcohol acting upon a body already weakened by venereal infection. Dr. Duncan had warned against the combination of mercury and alcohol.

The account of this phase in Fergusson's illness would appear to refute the diagnosis of depression and to suggest an organic confusional state instead. The fact that none of Fergusson's relatives suffered from a depressive illness would again tend to undermine the diagnosis of manic depressive illness which has a hereditary basis.

If we turn to the second phase of Fergusson's illness, the period between late July to October, 1774 – we are dealing with the period during which Fergusson fell down a stairway, was confused, was admitted to the bedlam and died suddenly. The explanation for this phase appears fairly clear and that is that Fergusson was suffering from the consequences of a head injury. We know that after falling down a staircase, 'he lost a great deal of blood'(54) and he became confused – 'his brain disordered' (55) as one biographer had it. We also know that his confusion fluctuated during his time in the bedlam and that he complained of headaches. A well recognised complication of a head injury, which corresponds to what we know of Fergusson, is that of subdural haematoma. As we know,

this can give rise to fluctuating confusion and to headaches. Sudden death is also a recognised feature. It is possible then that Fergusson developed a subdural haematoma following his head injury which led to his changeable mental state and complaint of headaches. His sudden death could easily be caused by such a condition. Previous theories invoking dissipation or melancholia do not adequately explain the fact of Fergusson's sudden death and of his seemingly good health in the hours immediately prior to his demise.

Conclusion:

It is of course impossible to state unequivocally the reason for Robert Fergusson's early death. Accounts of his life were generally written a considerable time after his death, thus leading inevitably to some inaccuracy. Despite this, however, a study of available information strongly suggests that he died from the consequences of a head injury. His illness prior to his head injury was probably caused by venereal disease, exacerbated by partaking in alcohol whilst on medicine. However, I should like to leave the last word to another poet, Robert Burns, who was enormously influenced by Fergusson and who in fact paid for a grave stone to be erected for Fergusson which now stands in the Cannongate churchyard. Burns wrote of Fergusson:

> 'O thou my elder brother in Misfortune, By far my elder brother in the muse, With tears I pity thy unhappy fate! Why is the Bard unfitted for the world, Yet has so keen a relish of its pleasures.

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50. C.A. Moore, *Background of English Literature, 1700-1760*. (Minneapolis: University of Minnesota Press, 1953), 179.

51. G. Cheyne, *The English Malady*. (London: G. Strachan, 1733).

52. Peterkin, *Fergusson*, 51.

53. Irving, *Lives*, 429.

54. Chambers, *Fergusson*, 308.

55. Sommers, *Fergusson*, 29.

Dr. Beveridge's paper was followed by one from Mr. John Chalmers on William MacGillivray.

WILLIAM MACGILLIVRAY AND HIS ASSOCIATION WITH JOHN JAMES AUDUBON

William MacGillivray was born in Old Aberdeen in 1796. At the age of three he was taken to live with farming uncles in Harris, his father a surgeon in the 79th. Regiment (Cameron Highlanders) being much away from home. (His father was later killed at the battle of Corunna in 1809). Little is known of his childhood, but during this period he must have acquired his love of nature and of the wild places which so dominated the rest of his life.

At the age of eleven he returned to Aberdeen to finish his schooling, and the following year he commenced his university education at King's College, gaining in due course an M.A. degree. In 1814 he commenced the study of medicine as the pupil of a Dr. Barclay who was only three years older than himself. During the summer vacations he would return to Harris, travelling on foot and often deviating on the way to explore new country and study wildlife. He travelled light and slept rough undergoing dreadful privations but never allowing these to cloud his appreciation of his surroundings. From his early days he kept a detailed journal of his activities and his studies, but alas all but two of these journals covering periods in 1817, 1818, and 1819 were lost in a fire in his son's home in Australia many years later. The fragments of his journals which survive reveal a gifted writer with a wonderful talent for describing scenes and places. MacGillivray emerges from his writings as a rather reserved philosophical individual.

> "Travelling I conceive to be of the greatest utility, not merely to the naturalist, the poet, and the painter, but also to the moralist. Sure much am I beholden to it. It has disclosed to me faults which neither I, under dissimilar circumstances could discover nor my friends inform me of. I have reaped most advantage from solitary travelling . . . Solitude is the parent of contemplation, the source of virtue and of science. The bosom is the sanctuary to which we should flee when harassed with care, crossed by disappointment, tortured by remorse".

In 1817 MacGillivray appears to have had misgivings about continuing his medical career. He took a year out to travel in the Highlands and Islands and further his studies in natural history. In 1819 he finally abandoned his medical studies and decided to travel on foot to London to visit the British Museum. Typically he avoided the direct route so that he might "acquire further knowledge of nature as would result from my observations in the course of this journey" which took him via Braemar, Ben Macdhui, Fort William, Ben Nevis, Inverary and Ayr. He travelled light carrying only "a penknife, a small ink piece with pens, a small itinerary of Scotland, a glass for drinking by the way, and a towel. To my dress I have added a greatcoat and a pair of old gloves". At Alloway he visited Burns birthplace, then a public house. "I entered it and got half a mutchkin of the favourite potion of the unfortunate bard. I knelt down . . with my hat off 'Immortal Burns' said I aloud, 'here on my knee, I do homage to thy genius and pour forth this libation to thy memory'" He travelled 500 miles in 30 days on a budget of ten pounds. preferring to spend his nights in the open. A typical breakfast of bread and a gill of whisky cost him two pence.

Later that year he transferred to Edinburgh to attend the lectures of Robert Jameson, Professor of Natural History. In 1820 he married Marion M'Caskill, a native of Harris, by whom in due course he had twelve children. In order to support his new responsibilities he

acquired a post as assistant and secretary to Jameson. This must have been a busy job for in that year the new Natural History Museum was completed in the extension to the Old College of the University to Playfair's design. It occupied two floors of the west side of the quadrangle in what is now the Talbot Rice Art Centre and the Senate Hall. MacGillivray must have been heavily involved in rehousing and cataloging the extensive material which had accumulated including the valuable Dufresne collection of stuffed birds which had recently been acquired, a task for which he was well suited and no doubt relished. During this period he started to make his many contributions to the scientific literature in fields as diverse as geology, botany and zoology. Charles Darwin who was a medical student in Edinburgh during 1825-1827 writes disparagingly of the quality of the lectures and lecturers, but wrote that he had "much interesting talk with MacGillivray".

In 1831 he obtained the post of Conservator of the Royal College of Surgeons Museum in the face of stiff competition. His predecessor was Robert Knox who had fallen out of grace following the activities of Burke and Hare although he continued with his extramural lectures in anatomy to a large following. Again MacGillivray's task involved the transfer of museum specimens to the new Surgeons Hall, another Playfair building, which had been designed principally to accommodate the museum. MacGillivray acquitted himself well in this task. A college minute in 1832 reads

> Mr. Wood said there could be but one opinion as to the general assiduity and talent which had been shown by the conservator in the very arduous task of removing and arranging the museum, which he had performed so much to the satisfaction of the College. He therefore begged to move that the sum of £50 together with the thanks of the College be presented to the conservator.

His decade as conservator was one of intense activity. In addition to his official duties he wrote several books including vols 1-3 of his classic 'A History of British Birds' and numerous scientific papers and translations from French and Latin. The most important event of these years however was his meeting with J. J. Audubon, an event which had a profound influence on the lives of both men.

John James Audubon was born in 1785 in San Dominigo (now Haiti), the illegitimate son of a French adventurer and a Creole woman who died soon after his birth. His father who made and lost a fortune as sugar planter and slaver, returned to France in 1789 where he and his tolerant wife legally adopted J. J. A. Due to the disturbances leading to the French Revolution, Audubon had little formal education but showed an early interest in nature and an absorbing talent amounting almost to an obsession for drawing and painting. He had little formal art education apart from a brief apprenticeship to Jaques Louis David from whom he learned the technique of portraiture which was to stand him in good stead later by enabling him to earn a living during his many financial crises. In 1803 he was sent to the United States to manage a farm which has father had acquired near Philadelphia and there he met and married Lucy Bakewell, the daughter of a neighbouring estate owner of English origin. Unlike MacGillivray he led a carefree and hedonistic existence to the neglect of the farm which went bankrupt. Thereafter he tried his hand at a number of other careers, including that of a storekeeper in the frontier town of Louisville, Kentucky.

One day by chance an Alexander Wilson entered his store seeking customers for his bird book. Wilson was himself an interesting character. He was a Scot, born in Paisley, of most humble origins, who although virtually uneducated, developed fame as a poet and

later as an ornithologist. He emigrated to America in 1794 having fallen foul of a local merchant, and dedicated the rest of his life to producing his nine volume 'American Ornithology' not only doing the illustrations but also for the first time, attempting to classify the birds according to Linnaean principles. He is recognised as America's first ornithologist.

Audubon, on seeing Wilson's paintings, realised that his own with their emphasis on grace and movement, were infinitely superior and for the first time appears to have recognised their commercial potential. With uncharacteristic dedication he applied himself with great intensity to the completion of his work, spending several years travelling the length and breadth of North America observing its wild life, gathering and painting specimens. He supported himself by painting portraits and his long suffering wife, whom he rarely saw, ran a girl's school and on several occasions bailed him out of bankruptcy.

In 1826, having nearly completed his portfolio, he was unable to find support for its publication in America and accordingly came to Britain and soon made his way to Edinburgh, then still in the afterglow of its Age of Enlightenment. After an initial rather frosty reception he soon made contact with many of the leaders of Edinburgh society, including the notable medical personalities of the time. He was a strikingly handsome man, with piercing blue eyes and long shoulder-length hair and he caught the imagination of the citizens of Edinburgh as a romantic woodsman. Once accepted he was overwhelmed with invitations to attend social functions and to lecture and exhibit his paintings to learned societies. While he enjoyed the adulation and the useful contacts, he found the elaborate dinners a bit of a strain and resented the time wasted from the final preparations of his paintings. Like MacGillivray he kept a vivid journal during this period and wrote;-

> "Much as I find here to enjoy, the great round of company I am thrown in has become fatiguing to me in the extreme, nor does it agree with my early habits. I go to dine at six, seven, or even eight o'clock and it is often one or two when the party breaks up. Then painting all day with my immense correspondence, makes my head feel like an immense hornet's nest and my body weary beyond all calculation".

Audubon had many meetings with Robert Knox, who first greeted him straight from the dissecting room with his hands covered with blood. Later Audubon attended one of Knox's lectures in the Old Surgeons Hall.

> "we descended the stairs and opened the door of the lecture room. There was seated probably a 150 students; a beating of feet and clapping of hands took place that quite shocked me. Dr. Knox entered and all was hushed as if silence had been the principle study of all present. I was much interested in the lecture which lasted three quarters of an hour. The doctor took us through the Anatomical Museum and his dissecting room. The sights were extremely disagreeable. I was glad to leave the charnel house and breath again the salubrious atmosphere of fair Edina".

Eventually Audubon was introduced to William Home Lizars who agreed to undertake the engraving of his paintings. Lizars was himself an artist of considerable merit and an outstanding engraver who had published, inter alia, a beautifully illustrated work on

anatomy together with his brother who was professor of surgery. Audubon was overwhelmed. He wrote "perhaps even yet fame will be mine and enable me to provide all that is needful for my Lucy and my children. Wealth I do not crave but comfort, and for my boys I have the most ardent desire that they may receive the best of education". Alas after engraving only six plates Lizars reported that his colourists had gone on strike and he could not complete the contract. Perhaps the problem was that Audubon insisted that the birds be depicted life size which involved plates of enormous size known as 'double elephant folio'. In the event he later found another engraver in London, Robert Havell, who completed the 400 plates over a period of ten years. The sets of plates were sold for the vast sum of 160 guineas, the equivalent of MacGillivray's annual salary. One hundred and ninety sets were sold, and at last Audubon's fame and financial security were established. These sets have now become greatly prized and at a recent auction one was sold for 2.5 million.

To accompany his paintings Audubon wanted to publish a written companion but lacking any scientific training he realised that he would need a collaborator. A great admirer, James Wilson, himself a natural historian of note, introduced Audubon to MacGillivray. During the period from 1830 to 1839, the two men wrote the five volume Ornithological Biography. It was said that Audubon "gave life and spirit to the beautiful objects he delineated with passionate love" while MacGillivray provided "the bone and sinew, the hidden anatomical parts beneath the lovely form, the nomenclature, the classification, the technicalities of science".

During this very productive period MacGillivray published the first three volumes of his own History of British Birds in which he makes frequent acknowledgement of Audubon's help. He also aspired to produce a portfolio of bird paintings to accompany his text, but alas due to shortage of time and money he never completed his task. The 123 unpublished paintings which survive are housed in the Natural History Museum in London. These paintings reveal a considerable talent in which the style and perhaps the hand of Audubon is sometimes apparent. Some of the paintings record that they were drawn from specimens shot by Audubon in the vicinity of Edinburgh.

The friendship and mutual respect of the two men continued for the rest of their lives. During one of Audubon's several sojourns in Edinburgh, MacGillivray took him on a conducted tour of his beloved Highlands. MacGillivray also named one of his children after Audubon and dedicated his book on the Rapacious Birds of Great Britain to him. Audubon immortalised his friend by naming the MacGillivray warbler after him.

Audubon spent the rest of his days enjoying the adulation and honours which he now received on both sides of the Atlantic. He set about producing a companion work on the Quadrupeds of America, a task in which he was greatly assisted by his two sons, who completed the work a year after his death in 1851.

In 1841 MacGillivray was appointed Professor of Natural History in Marischal College Aberdeen, a post which he held until his death in 1852. During this period he continued to publish extensively on many aspects of natural history and his teaching was greatly appreciated, but alas he failed to attract the fame and public recognition accorded to his associate, although the scientific contribution of his work was substantially greater. He was buried in the New Calton Cemetery in Edinburgh where his grave is marked with a suitably inscribed memorial which was erected in 1900.

THE ONE HUNDRED AND THIRTY SECOND ORDINARY MEETING

The One Hundred and Thirty Second Ordinary Meeting was held on 23rd March 1991, at the Scottish Health Service Centre, Edinburgh, with the President, Mr. John Blair in the Chair. One hundred and two members or guests were present. Mr. Blair paid tribute to the memory of two former senior members of the Society who had recently died, Dr. Haldane Tait, the Honorary President and Sir Charles Illingworth, a former President. It was announced that the British Society of the History of Medicine had asked the Scottish Society if it would be prepared to host the 1994 International Congress of the History of Medicine.

The first subject of the meeting was Brahms and Billroth and this consisted of three contributions. Mr. Eric Gilmour, who had delighted the Society in 1985 with his paper on Music and Medicine, set the scene by playing, on the piano, excerpts from the four Brahms Symphonies. Papers by Mr. I. F. McClaren and Mr. I. M. C. MacIntyre followed, linking Brahms with Billroth. Both speakers made reference to Billroth's lifelong passion for music, his participation in string quartets and his friendship with eminent composers. Mr. MacIntyre's paper was entitled

THEODOR BILLROTH – A SHORT BIOGRAPHY

It is my pleasant task to provide a brief biography of Theodor Billroth and to describe one of his major innovations – the first successful partial gastrectomy.

In compiling this short biography I have had help from several sources which I would like to acknowledge. Firstly Alison Stevenson, the Archivist at The Royal College of Surgeons of Edinburgh. Secondly a surgeon who is arguably the greatest living authority on Billroth, Dr. Robb Rutledge, who lives surprisingly not in Vienna but in Fort Worth, Texas. He has kindly supplied many of my slides.

Serious research about Billroth demands a visit to Vienna. As we have already seen and heard today, Vienna is a city of sophistication and culture, a city where the music of Mozart, Beethoven, Brahms, Strauss and countless others is alive and well.

If you walk along the Ringstrasse to the Schottentor and take a No. 38 tram to the delightful suburb of Grinzing where Vienna meets the Vienna Woods, you will pass an imposing building on your left. In the imperial days of the Hapsberg Empire this was the Academy of Military Medicine and Surgery, part of the complex of the massive Allgemeine Krankenhaus, the largest general hospital in Europe. Today it houses the Department of the History of Medicine and I can certainly recommend a visit to members of the Society. You will be interested to know that the Department of the History of Medicine has a Professor, three Associate Professors and several Researchers. You will be assured of a warm welcome as the Secretary to the Professor of the History of Medicine is the daughter of a well known Edinburgh surgeon whom many of you will remember – Mr. Jim Jeffrey. I am grateful to Miss Jeffrey and other staff of the Department for their generous help.

Theodor Billroth was born on April 26th, 1829 at Bergen on the little Baltic island of Rugen just off the North German Coast. His parents were of Swedish stock. His father was a Deacon in the Lutheran Church but died when Billroth was 5 years old. This meant that

Billroth's mother had to bring up the family alone but she proved to be a strong and resolute woman who was to be a decisive influence in Billroth becoming a doctor rather than a musician. Music was an early love in his life and was to remain a life long passion.

To be nearer relatives and in order to educate her five sons, Frau Billroth moved her family to Griefswald, a small University town near the North German Coast, which to this day maintains a strong Swedish influence. Here Billroth began his medical studies but after one year at Griefswald he moved to Gottingen in 1849. Here he continued to develop his interest in music, composing, playing the cello and the piano. At Gottingen he experienced what he was to describe in later life as a memorable musical interlude. Jenny Lind, the foremost Swedish singer of her day, came to Gottingen to sing for the students. Billroth had the distinction of being chosen to accompany her at the piano and wrote an excited letter to his mother to announce that he had fallen in love with her.

In 1851 he transferred to Berlin University to complete his medical studies. Here he came under the influence of Bernard von Langenbeck, the leading German surgeon of his day and this inspired Billroth to pursue a career in surgery. He graduated in 1852 and went on to become Langenbeck's assistant. It was at this time that his ability in research and in writing became apparent. He savoured the sorrows as well as the joys of academe. Many of us will sympathise with his words "Academic medicine is a miserable job – like quicksand, the deeper one steps the thicker one sticks".

Like so many in this situation his sorrows were brightened by meeting a young lady. Christel Michaelis was a doctor's daughter who shared his love of music. They were married in 1858 and theirs was to prove a strong and lasting marriage – Christel's serenity balancing her husband's enthusiasm.

In 1860 Billroth was offered the Chair of Surgery in Zurich. Zurich was to prove a productive period where he formulated his ideas on education, surgical training and what we now call audit. He published "General Surgical Pathology and Therapy" which was to remain a standard textbook for four decades, running to 16 editions and being translated into ten languages. Zurich saw a growth in his surgical stature and a developing taste for good food, good company and of course for music.

Vienna truly was the cultural capital of Europe (I understand that there have been latterday pretenders to this title!). It was the crossroads of Europe, a neat blend of many cultures, the greatest musical city in the world and a city with a growing reputation in medicine. The Chair of Surgery became vacant in 1867 and Billroth was invited to fill it. It was a measure of his reputation that the Austrians should invite a Prussian to their most prestigious Chair just one year after Austria had lost the Austro-Prussian War (the 7 weeks war). There are those who argue that he was attracted to Vienna as much by the music as by the medicine. Thus when he arrived in Vienna his contemporaries there included Schuman, Wagner, Mahler, Dvorak, Bruckner, List, Johann Strauss and of course Brahms. The Viennese, of course, were as proud of their medicine as they were of their music. The Allgemeine Krankenhaus had been founded in 1784 and was by the 1860's the largest teaching hospital in Europe (those of us who despair of a new hospital ever being built in Edinburgh can take some comfort from the knowledge that much of this ancient Viennese hospital remains in use today). It was here that Billroth developed teaching, his training of young surgeons many of whom were to become Professors all over Europe. His introduction of new and successful operations led to him becoming the greatest surgeon of his day.

One gap in his experience had been military surgery. The outbreak of the Franco-Prussian War in 1870 saw Billroth volunteer to care for injured Prussian troops. The result of this short wartime experience was the first coherent account of triage and guidelines about transport of war wounded.

Billroth had been a surgical innovator since Zurich days. He pioneered radical glossectomy, and performed the first successful laryngectomy for *cancer* (the first successful laryngectomy was performed for syphilis by Watson in Edinburgh). He also carried out the first trans-abdominal resection of a bladder tumour.

Yet it was the first successful gastrectomy which was, of course, to bring lasting eponymous fame. His was not the first gastrectomy – Péan in Paris and Rydier in Poland had both tried unsuccessfully. Billroth's approach was typically teutonic, carefully planned and methodical. Two of his assistants, Gussenbaur and Winniwater had been given the task three years earlier of working out the details of the operation in animals and cadavers. Wolfler had been sent to Lister's clinic in Edinburgh to bring back the principles of antisepsis.

Therese Heller was 43-years-old and had been vomiting for about three months when she presented to Billroth's clinic in January 1881. She had a palpable mobile antral carcinoma. The operation performed consisted of resection of the antrum, reconstruction of the greater curve with interrupted silk and a gastro-duodenal anastomosis with interrupted silk. The operation took 12 hours to perform. As we are meeting today in Edinburgh, we might allow ourselves a little self indulgence about Edinburgh's contribution to this procedure. The procedure was performed under Chloroform anaesthesia and the antiseptic precautions recommended by Lister were used including soaking of the drapes and sutures in carbolic although Lister's carbolic donkey spray was not used on this first occasion.

Therese Heller made a remarkably troublefree recovery without intravenous fluids, blood, antibiotics or the like. Her temperature chart, showing uneventful post-operative progress, is another example of the discipline of the Billroth school, the meticulous recording of operative detail and of post operative observations. Not only was Billroth the father of gastro-intestinal surgery he was the originator of what we now call audit.

Wolfler recorded the first gastrectomies the following year in a classical paper, the first of a flood of papers about the new science of gastric surgery.

The Billroth school was now pre-eminent. Laboratory work inevitably included work on wound infection. Semmelweis in 1847 in the Allgemeine Krankenhaus had shown the beneficial effect on puerperal sepsis of medical students washing their hands between leaving the autopsy room and entering the delivery suite. Lister in 1867 had shown the value of antiseptic precautions in reducing wound infection. Billroth was initially sceptical but soon adopted Listerian principles with enthusiasm and became a staunch advocate. Less well known perhaps is his interest in microbiology. He was the first to observe both the streptococcus (which he named) and the staphylococcus – discoveries acknowledged by Koch who wrote a warm tribute to Billroth on these achievements.

Billroth's assistants were to become Professors all over Europe and his influence on the Mayo Brothers and Halstead in the United States was profound. The Billroth tree spread all over the world.

I shall briefly mention just three of these many pupils.

Czerny became Professor of Surgery in Heidelberg where he performed the first cervical oesophagectomy and founded the first Cancer Institute in Germany. He does have a link with this hospital in that he taught Anton Jurash, surgeon to the Paderewski Hospital based here at the Western General Hospital when the Polish Medical School was established here during the Second World War.

Wolfler became Professor of Surgery in Prague and performed the first gastro-enterostomy and the first radical thyroidectomy. It was he who visited Edinburgh to learn the principles of antisepsis which were subsequently used in Billroth's practice.

Mikulicz gave his name to the Heineke-Mikulicz pyloroplasty and to Mikulicz colonic resection. He introduced gastro-enterostomy to the United States by demonstrating it to the Mayos. Among his other many contributions were the introduction of the mask into the operating theatre. He was the father of oesophagoscopy and gastroscopy. He died of gastric cancer when in his mid 50's, diagnosing the epigastric mass himself as he leant over the operating table – in exactly the same way as Sir David Wilkie was to do in this city some 30 years later.

Billroth's social and musical life seemed as exciting as his surgical. He lived in a large house at 20 Alserstrasse where he entertained and composed, played, listened to and discussed music. Today the site of 20 Alserstrasse is a busy commercial thoroughfare with the memory of the halcyon earlier days and the memory of Billroth commemorated by a plaque. His friend Johannes Brahms was a frequent visitor and played many of his works for the first time in 20 Alserstrasse. Two of his three string quartets (Opus 51) were dedicated to Billroth. They frequently played together in a quartet and were frequently to be seen out and about in Vienna enjoying Gemutlichtkeit – the good things of life – often in the company of Hanslick, the leading music critic of his day.

Johann Strauss was another kindred spirit who also played and conducted music at 20 Alserstrasse. One unifying bond between them was their dislike of Wagner and their distaste for his music.

In later years Billroth travelled increasingly often to Abbazie on the Adriatic Coast, often to Italy and most frequently to his summer home in St. Gilgen overlooking the Wolfgangsee, a summer house which exists today as the Park Hotel Billroth.

Billroth died in Abbazie in 1894. He was undoubtedly the greatest surgeon of his day, an innovator, scholar and of course musician.

He has left a rich inheritance. Besides operative techniques he bequeathed a surgical school and a discipline which has influenced the life of every surgeon.

The final paper of the afternoon was an illustrated talk by Mr. Gerald McInnes on the Loch Maree tragedy of the 1920's. In August 1922, eight people, guests or employees of the Loch Maree Hotel, died within a week. The deaths were thought to be due to some form of food poisoning, but it took considerable forensic investigation, including a search for a buried sandwich and its transmission to a Bristol laboratory, for the final proof to be obtained. The deaths were shown to be due to be the result of Botulinus toxin in duck paste sandwiches which the victims had eaten. Mr. McInnes's paper was beautifully illustrated with many excellent slides.

This paper and the Brahms and Billroth presentation provided much interest and enjoyment for the large audience and grateful thanks were given to the speakers.

THE ONE HUNDRED AND THIRTY THIRD ORDINARY MEETING

The One Hundred and Thirty Third Ordinary Meeting of the Society was held at Dollar Academy on 25th May 1991 and was attended by 59 members and guests. For the first time in the Society's history, the meeting was chaired by a lady, the Vice President, Dr. Elizabeth Rose.

The first speaker, Professor David Waddell, gave an account of a yellow fever outbreak which occurred in southern Spain in 1819.

YELLOW FEVER IN THE EARLY NINETEENTH CENTURY CADIZ 1819

I first became interested in yellow fever when I was lecturing in the West Indies and learning something of the history of the Caribbean. One of the noticeable features was the high rate of mortality among new arrivals in the colonies. Both the graveyards of the islands and the records of families, whose young hopefuls went out to seek fortune in the sugar industry or fame in the armed forces, suggest that many lasted no more than a few weeks. Those who did not die of yellow fever or malaria often succumbed to a surfeit of rum. Apart from the aspect of human tragedy and the obvious effects on demographic statistics, the facts of life and death sometimes had direct effects on history – political and economic, military and diplomatic. There are many examples of this, but the one that most impressed me was the building of the Panama Canal – a project of immense strategic and economic significance. One of the reasons for the failure of the French attempt in the 1880s, masterminded by Ferdinand de Lesseps of Suez fame, was the heavy toll of yellow fever and malaria among the labour force; and one of the reasons for the success of the American project in the 1900s was the discovery in the intervening period of the method of transmission of these mosquito-borne diseases. The systematic elimination from the Canal Zone of the standing water, in which the insects bred, worked wonders.

The failure to understand yellow fever had some curious results. The French hospitals in Panama, for example, were perfect mosquito breeding-grounds. They were decorated with ornamental ponds, and the ends of the bed legs were put in cans of water – to stop ants crawling up and biting the patients. It is interesting that some people noticed that mosquito nets seemed to be helpful in warding off yellow fever, but it was assumed that this was because the nets absorbed the noxious miasmata (vapours given off by decomposing matter) that were believed to cause the disease {McCullough, 1977}. A correlation between yellow fever and stagnant water or swamps had sometimes been noted, but it was assumed that these conditions were the source of the poisonous emanations – for example, in a report on an epidemic in Belize, British Honduras, in 1860-1, which I found in the archives in Jamaica, and which was printed in the West Indian Medical Journal away back in 1958, when its then editor, my fellow speaker Dr. Tulloch, was a bit short of copy {Report, 1958}. Although I found the attempts of 19th century doctors and administrators to cope with a disease they did not understand quite intriguing, it was not until many years later, when I came across another case of some historical significance, that I made any attempt to follow it up.

It happened like this. I was working on the wars for the independence of South America from Spain. These broke out in 1810, in the middle of the Peninsular War, when it looked as if the mother country was about to be entirely occupied by Napoleon. Fearing that if they continued as Spanish colonies, they would fall under French rule, the colonists in many of the South American provinces overthrew their Viceroys and Governors and set up governments of their own. However, resistance to the French in the Peninsula never totally ceased, and when the tide of the war began to turn in 1811 and 1812, conflicts broke out in the colonies between the royalists who wished to restore Spanish rule, and various groups of revolutionaries, who quarrelled among themselves about how and when they should move towards complete independence. After the defeat of Napoleon, the Spaniards were able in 1815 to send an army out to South America, and in 1816 the royalists were in control of virtually all of their old empire except for present day Argentina. Although the revolutionaries did not give up, and continued to resist successfully in various provinces, it appeared to the absolutist King of Spain, who spurned all suggestions of concessions to or negotiation with the rebels, that a grand expedition against Buenos Aires could knock the heart out of the independence movement. It took a while to assemble the men, the money, the transports and the naval escorts, and it was not until the autumn of 1819 that everything was ready at the port of Cadiz. The sailing was scheduled for mid-September, but in August a ship arrived from Cuba with yellow fever on board. As the disease appeared among the sailors in the harbour it was closed, and as it spread to the city it was cordoned off, and the assembled troops had to be evacuated inland. The expedition was of course necessarily postponed. The epidemic was at its height in October, abated in November, and ended in December. A 40-day quarantine period was then declared, with the expedition to sail immediately it was over. But it never did. The troops had always been reluctant to go – few from earlier expeditions had seemed to survive the fierce enemy and pestilential climate. Many had deserted in the course of their dispersal, fleeing the army as well as the fever. And the delay had given an opportunity to both Buenos Aires agents and Spanish malcontents to undermine the morale and loyalty of the soldiery. In January the army mutinied, and the movement soon developed into a constitutionalist revolution which forced liberal measures on the recalcitrant monarch. The South Americans took heart from the evaporation of the royalist military threat, and by 1821 most of the Spanish Empire was irretrievably lost. The untimely outbreak of yellow fever in Cadiz in 1819 was a contributory factor to that result.

This revived my interest in the disease, and I decided to note any references I came across in the course of my researches on the diplomatic history of the period. These were mainly from the reports of the British Consul in Cadiz and the British Ambassador in Madrid {P.R.O. 225-7}, plus one or two snippets from the Spanish archives; and my wife extracted the information printed in the London Times-newspaper between August and December 1819 on my behalf. From this material I have been able to construct a fairly detailed account of the course of the epidemic – more detailed than any I have seen for any of the epidemics of this period. I have set out most of the figures in the table. I have little doubt that further research in Spanish archives could produce fuller and more accurate figures, but I am not sure that this would serve any very useful purpose.

However, before I discuss the 1819 epidemic as a case study, I should say a little about yellow fever itself, as I imagine some of you may never have seen a case. Indeed, although my co-speaker spent several years practising in the tropics, he saw only one case, and that was only identified at post- mortem {Tulloch & Patel, 1965}. I trust, however, that there will be someone among you with more experience, who will later be able to put us all right.

The first important point is that the virus is communicated by the *aedes aegypti* mosquito, which flourishes close to human habitation, and breeds by preference in standing water in artificial containers. It must feed on the blood of an infected person within the first three days after infection. Thereafter the human is not infectious. The virus then requires ten to twenty days within the mosquito's system before it can be transmitted to another human by bite. After this period the mosquito remains infectious for the remainder of its life, which can be up to six or seven months, though because of the various hazards to which mosquitos are exposed – there is high mortality after the first laying of eggs, and the risk of being eaten by other insects or by birds, or swatted by humans – the average life span is probably no more than ten days. It should, moreover, be noted, that only female mosquitos feed on blood, and then normally only once before each egg-laying cycle of two or three days. It is the incubation delay within the mosquito which accounts for the typical pattern of a few initial cases of yellow fever, then a gap of a week or more before all hell breaks loose {Gillett, 1971; Mattingley, 1969; Burnet & White, 1972; Wright & Baird, 1968; White & Fenner, 1987}. Either of two limiting factors could end an epidemic in our period. In the tropics, where the natives had acquired a resistance, and the disease attacked newcomers, the more normal conclusion would seem to be the exhaustion of the supply of non-immune humans. In Europe, where there were large reservoirs of people at risk, relief followed a drastic reduction in the mosquito population, usually associated with a change in weather or season – the *aedes* does not live very happily much below 70°F. {Christophers, 1960}.

After infection the disease usually takes two days to manifest itself. Its onset is characterised by shivering, high fever, thirst, headaches, and pains in back and legs. This may last for up to two to four days. When it subsides that may be the end of a mild case, and this is presumably the norm for natives of areas where the disease is endemic. But in more serious cases the remission (lasting between a few hours and two days) is followed by the patient turning yellow – especially the face and eyes. This seldom lasts more than 10 days – if you last that long you will probably survive. In acute cases, the final phase will probably occur well within that period, and its principal feature will be the dreaded 'black vomit' – massive internal haemorrhaging – with death within 8 or 10 hours. Although the fatality rate is generally around only 5-20%, it was a particularly terrifying disease, both because of its symptoms, and for its unpredictability. It came in great periodic waves; was not confined to the great unwashed; or to the weak or aged – indeed most of the victims were youngish adult males. And unlike malaria, which was accepted as a fact of tropical life though it had a higher rate of eventual fatality, yellow fever often meant sudden death. Survival was a lottery, for there was no effective treatment. Doctors in the early 19th century tried a range of remedies – emetics, quinine, bleeding, mercury, camomile, mineral waters – but others noted that patients recovered without any of these, and advocated passive measures and fresh air, thus differing little from modern practice. Others favoured various dietary fads, for example that black chickens were preferable to those of other colours {Molina, 1978; Wright & Baird, 1968}. Although the authorities took appropriate preventive measures in terms of their ideas about how it was spread, these were not unnaturally inadequate in view of their ignorance of the role of the mosquito.

Now to the case. A possible scenario would start with an infected mosquito biting a susceptible human in Cuba, on or about 13 June 1819. This person then boarded the Spanish warship *Asia* in Havana, which sailed for Cadiz the next day. Within a day or two the passenger would have developed fever symptoms, and while still infectious, would

have been bitten by some of the colony of *aedes aegypti* mosquitos on board – sailing ships were in some respects an ideal habitat. Their fresh water containers offered the preferred type of breeding-place {Boyce, 1911. Though the lack of plant life on board may have posed problems of survival for the males, essentially nectar-feeders, the *aedes* typically mate immediately on emerging from the pupa, and once fertilised, the female could continue to lay fertile eggs for several weeks. Provided blood meals were available, up to 10 eggs could be laid every few days; most of the 40 or so newly emerged females would be immediately fertilised by the 60 or so males, and after some 14 days their progeny would in turn be ready to emerge from the larval and pupal stages {Christophers, 1960}. Whether or not the passenger survived or died, or whether his condition was correctly identified as yellow fever, is irrelevant. Some two weeks later, all the female mosquitos that had bitten him on his first two or three days on board would have become infectious, and everyone on board who was not immune would be at risk. There was in fact plenty time in the course of the 53-day voyage for the cycle to be completed three or four times, with more human cases able to infect more and more of the mosquito population, which could sustain itself indefinitely through reproduction, at least as long as the temperature remained tropical, and favourable breeding and feeding conditions persisted. Even if the conditions became less than optimal, some mosquitos could have survived in a state of dormancy. Within the confined space of a ship (probably about the size of the *Unicorn* in Dundee, and certainly smaller than Nelson's *Victory* in Portsmouth), it seems unlikely that anyone could have escaped, though quite possibly most of the crew would be immune through previous exposure, seafaring being a high-risk occupation for yellow fever. All this is speculation, based on what I have found out about the habits of mosquitos {Gillett, 1971}. What we do know is that the *Asia* arrived at Cádiz on 6 August with yellow fever on board {P.R.O. 225}, though not how many cases and at what stages. It was sent to Minorca, where there were special quarantine facilities {Guerra, 1973; Rico-Avello, 1953}, but not before the silver bullion element in its cargo (the remainder was mainly the dyestuffs cochineal and indigo) had been unloaded {P.R.O. 227; Maria, 1820, and the infection had been allowed to spread among other sailors in the bay, and their resorts on shore {Times, 21913J Presumably some of the *Asia's* infected mosquitos must have found their way on to other ships, or ashore – though the *aedes* often restricts its activities to the immediate surroundings of its breeding-place, it can fly up to a kilometre. It also seems that a change of environment (such as coming to land after a long voyage could rouse dormant mosquitos to renewed activity.

There were rumours of fever ashore within a few days of the *Asia's* arrival, which would be consistent with a few immediate cases from bites from mosquitos from that ship. Local mosquitos in the town of San Fernando de León (commonly known as La Isla) adjacent to Cádiz, presumably feasted on these cases, and from 10 days later (about 16 August) they were starting to infect local people with each bite. By the 20th, when the authorities set up a cordon (A.G.S. 8189), over 100 had died, some 400 recovered, and over 700 new cases had been reported. In the next 10 days there were some 350 more deaths, 50 more had recovered, and there were over 1,300 still sick. It seems to have reached a peak in mid September with around 65 deaths per day, and to have dwindled away in the first half of October. According to the London *Times* {Times, 5/11/19}, virtually everyone who had not had the disease before contracted it, and the epidemic ended when there were no more non-immune victims for the fever to attack. The available figures for daily deaths are incomplete, but are compatible with the overall total of 2,509, given by Dr. Alfonso de

Maria, a member of the local health commission {Iglesias Rodriguez, 1987}, whereas the *Times* total of 3,225 deaths seems exaggerated. The population of La Isla, after those who were in a position to flee at the first word of the epidemic had done so, was said to be 16,000, of whom half had previously had the disease. This implies a mortality rate of between 15% and 16% of the whole population, and a case fatality rate of just under one-third, if we accept that all of the non-immune population may be regarded as cases.

In nearby Cádiz itself, with a population of 70,000, the epidemic was later in starting. But by 24 August, there were already cases in the hospital, possibly of sailors from the bay. On 7 September the British Consul commented that the course of the disease could be traced along the streets through which the sick were taken from the ships to the hospital in the city. We can theorise that these people, in the early infectious stages of yellow fever, might well have been bitten in transit in late August by local mosquitos at every street corner – *aedes aegypti* is a daytime feeder. Early in September the virus would be ready to be passed on by the next bite, giving rise to 3,000 cases by the 18th, and, as the cycle produced an ever larger infected mosquito population, an increase to 8,000 by 27 September, 10,000 by 8 October, and a peak of around 13,000 on the 19th of that month. Corresponding daily deaths rose from 45, to 70, to over 100 in mid-October. Then there was a slow decline, which became rapid in November, when the weather turned cold, and, as we have already seen, the epidemic was officiallv declared over in December.

How many people in Cádiz had contracted the disease is not recorded, and it is difficult to calculate, as there is no indication of how long people remained on the sick list. Adding the daily totals of sick, making allowance for the gaps, produces a grand total of around 360,000. If the average period of sickness was 10 days, there would have been 36,000 cases, or about half the population. We can be rather more definite about the number of deaths. According to Alfonso de Maria, there were 4,537 {Iglesias Rodriguez, 1987}. This is very close to the figure that can be arrived at by using daily totals of dead, and interpolating estimates for those missing. This procedure gives us about 1,200 deaths in September (some 300 in the first half of the month and 900 in the second), 2,650 in October and 550 in November – a total of 4,400. This implies a case fatality rate of 12% – in the middle of the normal range. Deaths were around 6% of the total population of 70,000, considerably less than in La Isla, where the epidemic had run its full course before the change in the weather. This figure corresponds closely enough to the estimate of 5%, made by Dr. Manuel Codorniu Ferreras, chief medical officer to the expeditionary army, of whom I will say more shortly {Codorniu Ferreras, 1820}.

It is interesting to compare these figures with those for an earlier epidemic in Cádiz in 1800, when approximately 50,000 of a total population of 60,000 were affected, of whom 40,000 recovered and 10,000 died {Times, 8/12/1819; Aréjula, 1806}. The higher proportion involved (84% compared with my guess of 50% in 1819) reflects the fact that this was the first epidemic in the city for several decades, so few would be immune; whereas there were further outbreaks between 1800 and 1819, which would have increased immunity. It is possible also that the fall in the case fatality rate from 20% to 12%, and the drop in the proportion of deaths in total population from 17% to 5-6%, can be attributed, as Dr. Codorniu suggested, to the experience of these outbreaks, which, through the opportunities for trial and error, may have led to improved treatment, though I doubt if the improvement could have been very substantial.

One interesting figure is the male to female ratio among the deaths. The overall ratio in Cádiz in 1819 was said to be 25:1 or 96%. This compares with 79% in detailed figures for September, and 80-85% for the 1800 epidemic {Times, 11/12/19; Aréjula, 1806}. This male preponderance (and I might add, a concentration in the 20-40 age group) is a feature of most of the available mortality figures for several epidemics in southern Spain in the early 19th century {Iglesias Rodriguez, 1987; Rico-Avello, 1953; Aréjula, 1806}. It also emerges from some modern studies of yellow fever in rural areas – for example 93% in certain regions of Colombia between 1934 and 1956. There it has been attributed to occupational factors, jungle woodcutters, essentially men, being most at risk from the tree-dwelling *haemagogus* mosquito vector {Ward, 1972}. Occupational differentiation could also account for any male predominance in cases such as soldiers and sailors, or canal workers in Panama. But it is less convincing as an explanation for an urban outbreak such as that in Cádiz, though my fellow-speaker suggested to me that males might be at greater risk, as more likely than females to be working out of doors. I was glad to find this confirmed in one of the modern Spanish authorities, which notes that in hot weather men would have plenty of skin exposed to the insects, whereas the traditional modesty of the female would impose more of a barrier {Carrillo & Garcia Ballester, 1980}. This greater hazard would, of course, be reflected in a predominance of cases as well as of deaths. Unfortunately there are few data on sex distribution of cases as opposed to deaths. I have found only three examples. Two of these are for Malaga in consecutive years. In 1803, males accounted for 62% of both cases and deaths. But in 1804 – a more devastating epidemic which seems to have struck almost everyone who escaped the previous year – only 48% of the cases were male, but still 65% of the deaths. Putting it another way, in 1803 the case fatality rate was just over 40% for both sexes; in 1804 it remained at that level for females, but doubled to 83% for males Aréjula, 1806}. There may be something wrong with these figures, but we still have the third case, which concerns the, admittedly rather patchy, findings relating to a recent epidemic in Eastern Nigeria in 1986, where the vector seems to have been the village-haunting *aedes africanus*. Here only some 53% of cases were male, but almost 80% of fatalities {De Cock, 1988}. However, with such limited data, there is little point in puzzling further over these apparent differences in male and female case-fatality rates.

So much for the statistics. Now, when I embarked on this project I thought that the only other thing I would have to do would be to relate this account of the 1819 epidemic to its context of contemporary knowledge of the disease, by looking up some medical dictionary of the period. But when I started investigating contemporary interpretations of yellow fever, and ideas about its prevention, I found that I had opened up a real can of worms. I had to go into this aspect much more deeply than I had expected, and indeed in many ways it proved the more interesting part of the study. In earlier times the epidemic nature of yellow fever had led people to believe that it was contagious, like more familiar ailments such as smallpox and measles. However, by the beginning of the 19th century closer observation had begun to raise doubts, and the studies made of an epidemic in Philadelphia in 1794 had converted many to anti-contagionist views. It is interesting to observe here that Benjamin Rush, who discussed that epidemic, noted an abundance of mosquitos, but did not make the link, and instead popularised the notion of a poisonous miasma as the cause; and also that a Dr. Crawford of Baltimore, who in 1807 argued that mosquitos transmitted yellow fever and other diseases, was ridiculed and lost his practice, though he certainly was somewhat wide of the mark in suggesting that they did so by implanting their eggs {Peller, 1959}.

Spain, however, remained traditionalist in its approach. The disease was not unfamiliar, for there had been epidemics in Cádiz (which handled most of the trade with the Spanish Empire in America) in the 1730s and in 1764, but the country seems to have been largely free of the disease for the next thirty years or so. However it returned with the new century. Cádiz suffered in 1800, 1804, 1810 and 1813, the first two of these epidemics affecting numerous towns in all parts of Andalucia, and there were occasional outbreaks in other provinces {Gularro Olivares, 1968}. Spain's leading authority of the time was Juan Manuel de Aréjula. He published a book in 1806, which, though entitled *Breve descripción de la fiebre amarilla . . .* (Brief description of yellow fever), ran to 472 pages {Aréjula, 1806}. He argued that the disease was contagious, in the sense that it was transmitted by emanations from the human body, and suggested that the 1800 epidemic in Cádiz was imported on a specific ship, rather than caused by emanations from local swamps. However, he did take account of environmental factors, to the extent that he stressed the marked seasonal incidence of the disease in the autumn, especially after a hot dry summer. Aréjula noted that various remedies were advocated, but in his opinion the only effective one was flight. In particular he had become sceptical of the usefulness of fumigation in controlling yellow fever; but the government, which preferred to be able to give the appearance of doing something, censored his comments {Ballester Carrillo, 1974}. He published his views on the ineffectiveness of fumigation in a report on a later epidemic in the more favourable political climate of a liberal regime in 1810, but it was savagely attacked when an absolutist regime was restored in 1814 {Cabanellas, 1814; Carrillo et al., 1974; Carrillo (ed.), 1986}. In general, however, Aréjula's work reflected the established orthodoxy of the day in Spain. There were occasional dissenting views {Iglesias Rodriguez, 1987, p.211ff.; Rico-Avello, 1953, p.53-6}, but when, for example, Jose Maria Mocio, a native of Mexico, who was commissioned to study the epidemic in Andalucia in 1804, stressed environmental factors such as hunger, filth, swampy conditions, and unusual weather, and could not find evidence to sustain contagion, his work failed to gain the approval of the Royal Academy of Medicine in Madrid, and was not published {Mociño, 1982}. The experience of Alfonso de Maria was similar. An anti-contagionist, he was not allowed to promulgate his views on the 1819 epidemic until the following year, when the liberal government restored the freedom of the press {Maria, 1820}.

In Britain the matter was more controversial. Sir James Fellowes (1771-1857), who had been inspector of hospitals in the Peninsula and chief medical officer to the British army in Cádiz, took much the same line as Aréjula, noting evidence for the importation of the 1800 epidemic from Cuba, and criticising the miasma theory, in a thick factual volume, *Report of the pestilential disorder of Andalusia . . .*, published in 1815, which seems to have been designed to justify his own conduct rather than to advance knowledge {Fellowes, 1815}. However, Edward Doughty, who had worked under Fellowes, and claimed that he had been dismissed for disagreeing with him too openly, implied that Fellowes had been too much under the influence of Spanish medicals, in his *Observations and enquiries into the nature and treatment of the Yellow, or Bulam Fever . . .*, published the following year {Doughty, 1816}. Doughty himself was convinced from experience, both in the West Indies and in Cádiz, where he carried out numerous post-mortems with impunity, that yellow fever was not contagious, but stemmed from noxious exhalations produced in certain locations under certain climatic conditions.

Nevertheless, in 1819, it is clear from the actions of the authorities that official Spanish opinion was still clearly of the contagionist persuasion. The local Board of Health had

been called to investigate fever in La Isla on 2 August (that is before the arrival of the *Asia*), but found nothing to panic about. They were called back again on 19 August and this time it was indeed yellow fever. They cordoned off the town, placed troops at all the points of access, and set up controls over the movement of live cattle and other foodstuffs into Cadiz. Neighbouring authorities were warned, and all ports of departure in the bay of Cádiz were declared suspect. A further cordon was placed across all the routes some distance inland to prevent people from the affected area reaching the interior of the kingdom. A post station was set up on the cordon to fumigate mail, and to arrange its further forwarding by different conveyances (A.G.S. 8189); and clothing and provisions for the troops were burned {Times 16/10/19}. When the disease spread inland to Seville, the measures taken to segregate the sick were so rigorous that people were said to be unwilling to report it until it was beyond treatment, as a result of which the case fatality rate was very high {Times 211/19}. But Seville was not much affected in 1819, with only 217 deaths {Iglesias Rodriguez, 1987}.

The chief medical officer for the expeditionary force, Dr Codorniu, however, was also an advocate of segregation. He believed that the disease was imported and contagious; that it could be transmitted by contaminated air; and that its 'seed' could be carried by the sick or by the immune to another location congenial to it, where it could revive and cause a further outbreak. The answers were isolation and fresh air. Ships arriving from affected countries should go directly to the quarantine station in Minorca; all susceptible localities should both eliminate bad air by covering sewers and keeping the streets clean, and establish lazarettos to isolate the sick in well ventilated conditions. So far as the army itself was concerned, he advised the commander in chief, that it should be evacuated to high ground where there was plenty of fresh air. In the account he wrote of his activities, *Historia de la salación del egército espedicionario . . .* (History of the salvation of the expeditionary army) {Codorniu Ferreras, 1820}, he explained how the headquarters was moved to Arcos de la Frontera which is on a breezy eminence, some 25 miles inland and several hundred feet above sea level; how more than 16,000 troops were dispersed to its vicinity; and how virtually the only losses suffered from yellow fever were among those left behind to form the cordon. As they lost something like one third of their strength, he reckoned he had been responsible for saving the lives of a third of those evacuated, or over 5,000 soldiers. Codorniu may have derived most of his views from Aréjula and other standard authorities, but his appreciation of the significance of altitude could have owed something to the experience of his medical father, Manuel Codorniu Vidal, of the outbreak at the port of Barcelona in 1803, where no further cases were recorded once the troops were moved to a camp in the hills {Danón, 1977}. Presumably the temperature both there and in Arcos fell too low for the comfort of the mosquitos. Curiously, Codorniu makes no mention of the immunity conferred by a previous attack of the disease, which would have been a good reason for moving the troops, most of whom came from more northerly parts of Spain where yellow fever was virtually unknown, and would therefore have been highly susceptible {Guerra, 1973}. In this connection it is interesting to note a comment in the *Times*, that most of the mercantile houses in Cádiz had had to close as their personnel were all sick, dead, or had fled, and that this was because they had mainly been recently established by non-immune incomers {Times, 2/11/19}.

But of course, whether the cause was human or environmental, the most obvious precaution, as Aréjula had said, was flight. The British Consul reported that people were fleeing from the city, and he took his own family to a country house out of harm's way. He

himself was certainly a firm believer in contagion. When the fever spread from La Isla to Cádiz, he considered this further proof of the idea that the disease was endemic in the area, and only raged when there was "a large concourse of strangers" in the neighbourhood. He noted, as already mentioned, that it could be traced along the streets through which the sick were taken to hospital, and later, wherever the army had been. He commented that if the expedition was to sail the choice of destination would have to take account of the fact that the troops "must be understood to carry the germ of the epidemic with them" and that they would have to go on "infected ships". But he too noted the influence of the weather. In September he said that the east wind which was blowing "would tend to increase the evil"; in October that the unusual length of the hot and dry summer was causing the spread of contagion; and in November that colder weather and the onset of rain were diminishing the number of new cases. He reported, when the epidemic was declared over, that one physician had argued that only a "general system of expurgation to eradicate the germ of the disease" would prevent it returning next year, but gave it as his own view that the 40 days quarantine from the last case was the best security they could have, as all danger of contagion would be removed by then {P.R.O. 225-7}. The London *Times* also took a contagionist view, stating that, although the general sanitary condition of Cádiz was good, the germ of the malady was concealed in its hospitals {Times 9/10/19}.

Apart from isolatory measures, such as cordons and quarantines, I came across only two suggestions for preventive measures. One arose from a report that a man, stretched across the street apparently dead, had been picked up by the nightly Cádiz dead-cart that took the victims to their graves. However, the man was only drunk, and when the movement of the cart revived him, he jumped out and ran off. Several days later he was none the worse, from which it was concluded that strong liquor was an effective preventive. It was said that a physician was planning to write a paper on the subject {Times 1/11/19}. Perhaps he tried the preventive himself, and never got around to the paper. The other came from a man called Bartlett, who wrote to the Foreign Office in September 1819, asking the British government to finance trials in Cádiz and other affected places, of his plan for the prevention of contagion by the use of gauze veils by persons coming into contact with pestilential effluvia. These would prevent the contagion penetrating the respiratory organs, which he was convinced, were the channel of communication of the disease. He had already published his suggestion in a scientific magazine called *Annals of Philosophy {Annals* 1819}, but in its support he could cite only the case of his daughter's escaping whooping-cough, and analogies of gauze protecting against frost-bite, gas and fog. His veils might have had some success, by preventing much of the face from being bitten, in the same way as mosquito nets appeared to be useful for keeping out miasmata, as I mentioned earlier. But there is no further correspondence, so presumably his plea went unanswered {P.R.O. 231}.

More successful was another British would-be investigator, Dr. Robert Jackson (1750-1827), who had published some works on fevers and had served as medical director for the British army in the West Indies from 1811 to 1815. On his retirement from that post he was given the half-pay appointment of inspector-general of military hospitals. Although his request of 22 October 1819, for a passage to Cádiz and assurance of access to patients, was approved, it had to pass through the Army Medical Department and the Foreign Office to the Spanish Ambassador {A.G.S. 8189}, which caused a delay of several weeks. By the time he reached Gibraltar, not only was the epidemic over, but the revolution of January 1820 had blocked his access to Cádiz. After waiting a couple of months without order

being restored, he made a trip to Greece, returning to the Cádiz area in August, in time to witness the start of the next season's outbreak of yellow fever, which proved to be a very minor one. Assisted by another British military surgeon, Thomas O'Halloran, he claimed some success in treating cases by blood-letting. His observations confirmed him in his opinion that the disease was not contagious, but as no notice was taken of his report to the British government to that effect, he published in 1821 his *Remarks on the epidemic yellow fever, which has appeared at intervals on the south coasts of Spain since the year 1800* {Jackson, 1821}. This dismisses Aréjula's evidence in favour of importation and contagion. Contagion, according to Jackson, is at variance with the accepted facts that it does not attach to clothing or dead bodies. Rather the disease spreads in an epidemic atmosphere, which occurs in certain locations under certain seasonal conditions. From this it follows that quarantine is a useless and superfluous precaution. Jackson's colleague O'Halloran, not surprisingly, reached similar conclusions, and pointed out that in the case of the 1820 outbreak, even the convinced contagionists could not establish importation, and had to attribute it "the revivification of the dormant seeds of the preceding epidemic". (We, however, may note in passing, that an infected mosquito could either have flown ashore from an apparently unaffected ship, or have remained dormant from one season to the next.) O'Halloran developed his ideas further, after observing the next major epidemic, that in Barcelona in 1821, during which, incidentally, he noted that "the flies and mosquitoes were infinitely multiplied", but without attaching any significance to it. His own book, *Remarks on the yellow fever of the south and east coasts of Spain . . .*, published in 1823 {O'Halloran, 1823}, blamed "unusual drought, excessive heat, want of ventilation in houses, exhalations from swamps, lakes etc., and above all, malignant effluvia, which arise from the decaying remains of putrid animal and vegetable matters".

The Barcelona epidemic attracted considerable international interest, and triggered off a dispute between contagionists and anti-contagionists that lasted for much of the nineteenth century. First in the field was a commission sent out by the French government, concerned about the proximity of the outbreak to its own territory. The French observers declared the disease contagious and imported, and their government acted to tighten up their sanitary laws to protect their frontiers {Coleman, 1987}. But others had different views. O'Halloran was joined in denouncing contagionism by ten physicians from Barcelona itself, an American, two Parisians, and another British doctor, Charles Maclean, whose motivation was clearly shown by the title of his book, *Evils of Quarantine Laws . . .* {Maclean, 1824}. This resurgence of anti-contagionism stimulated Sir Gilbert Blane, a physician to King George IV, to update his earlier contagionist writings on the subject in "On the yellow fever", published in his *Select Dissertations on several subjects of Medical Science of 1822* {Blane, 1822}. Blane suggested that a great deal of evidence linked the disease to ships and sea-ports and movement of people, rather than to local conditions. He accepted that some types did not appear to be contagious, but took the view that it was safer to take the sensible precautions of quarantines and isolation, even if they were inconvenient. Many ordinary people seemed to agree that this was common sense. They could see that yellow fever was spreading from port to port and country to country, and naturally assumed that it was carried by infected persons. But doctors knew that this did not explain what actually happened. Epidemics broke out in one place without the introduction of identifiable cases from outside, and failed to spread beyond certain points for no apparent reason. Sometimes people on the ground floor of a house were affected, but not those living upstairs. Isolation did not afford complete protection; and on the other

hand the closest contact frequently did not result in transmission – people who cared for the sick often escaped, as did mothers who slept with sick children. It was all very puzzling {Boyce, 1911}.

But the anti-contagionists had an alternative explanation of causation – the miasma concept – which placed the responsibility on the environment, and had the effect of stimulating various public health measures designed to eliminate the filth and rubbish that produced the miasmata; and some of these measures were beneficial, even if undertaken for the wrong reasons. It was no doubt morally and aesthetically satisfying to identify disease with filth. It was also politically and economically attractive, for contagionism implied quarantine regulations, which were commercially damaging and an infringement of individual liberty. One of the strongest motivations of the anti-contagionist lobby was the urge to demonstrate that quarantines were ineffective and unnecessary, and it was perhaps this more than anything that made it difficult to accept that neither interpretation was satisfactory, and that there might be some virtue in both sets of arguments {Ackerknecht, 1948; Cooter, 1982}. Moderation was noticeably absent from the debate. In Spain politicians denounced holders of both opinions as no better than murderers; and angry mobs blamed doctors for the spread of the disease, and threatened to lynch them. Some had to flee abroad to save their lives {Rico-Avello, 1953, p.50-2}.

The anti-contagionists won the battle of opinion over yellow fever by the early 1830s, partly because thereafter there were few further outbreaks in Europe. They then turned their attention to other diseases, especially cholera, with equal success until the 1860s, when the contradictory evidence supporting contagion became too strong {Ackerknecht, 1948}. But they were never totally unchallenged {Pelling, 1978}; and when in the 1860s maverick outbreaks of yellow fever in Saint-Nazaire and Swansea were tackled by open-minded epidemiologists, it could be shown conclusively that the disease had been imported from Cuba on specific ships, thus exploding the theory of local environmental causation. However, these incidents also strongly suggested that the disease was not contagious (at least in the normally accepted sense), but rather that the ships were in some way contaminated {Coleman, 1987}. The real cause and mode of transmission remained as obscure as ever, though suspicion of the role of the mosquito grew from the 1850s, at least in the United States. Nevertheless, during the American civil war in the 1860s, a Confederate surgeon was accused of plotting to assassinate citizens of the northern states by importing clothing that had been worn by persons who had died of yellow fever {*The Lancet*, 1990}. (I am indebted to our observant secretary, Fiona Watson, for kindly drawing this case to my attention.) And of course, as I mentioned at the start, the miasma theory continued to hold sway among the French in Panama in the 1880s, who were still groping in the dark, with even less success than the Spanish in Cádiz in 1819. It required the conclusive research of Carlos Finlay, Walter Reed and others in 1900, and its application by William Gorgas in the form of comprehensive mosquito control in Cuba and Panama to achieve the conquest of yellow fever. And the story is not over yet. Though after this success there were hopes that the disease could be entirely eradicated world-wide, it was established in the 1930s that the virus was also carried by monkeys in the South American jungle transmitted by a different variety of mosquito to people working in forests, and taken by them to urban areas, where large non-immune populations were at risk {Ward, 1972}. The monkey reservoir may not last much longer, given the rate at which the Brazilians are cutting down the Amazon forest, but the possible elimination of yellow fever is perhaps a small benefit to set against the damaging effects of global warming. And now that I have related this little piece of history to the contemporary human condition, I can stop.

YELLOW FEVER STATISTICS, LA ISLA AND CADIZ, 1819

Date	La Isla		
Aug.	Died	Recovered	New Cases
1-20	105	392	723
20-31	345	663	1,313

Date	La Isla		Cadiz		Date	La Isla		Cadiz	
Sept.	Died	Sick	Died	Sick	Oct.	Died	Sick	Died	Sick
1	c30				8	21	128	101	10,913
2	c40				9	25	99	90	10,194
3	c45				10	(total died		99	10,037
4	57				11	to 9 Oct.		105	10,037
5	50				12	3,225)			c11,000
6	40				13	17	192	130	12,000
7	35				14	12	203		
8	40	899			15	15	239	90	11,722
9	32	876			16			98	12,135
10	40	873	31		17			88	12,486
11	40	947			18			c97	12,465
12	46	1,018			19			106	c13,000
13	30	1,108			20				
14	65	1,237	84		21			c85	11,258
15	65	1,086	31		22				
16	65		30		23				
17	65				24				
18	70		30	c,3000	25			82	7,680
19	50		45		26			90	8,981
20			70		27			71	7,768
21					28			70	6,960
22					29				
23			66		30			61	
24		495			31			55	
25									
26					Nov.				
27			69	c8,000	1			46	
28					2			45	
29			62	4,075	3			38	
30			74		4			40	
					5			29	2,357
Oct.									
1	16		c86	9,230	9			c25	c1,000
2	16		91						
3			79		16			23	579
4			82						
5	24		c60	9,152	18			13	412
6	29	128	82	9,494					
7	23	132	75	9,619					

Sources: Public Record Office, FO 72/226-7; *The Times*, August-December 1819

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Professor Waddell's paper was followed by one from Dr. John Tulloch, who reflected on the changes he had witnessed during his forty years in medicine.

A BACKWARD LOOK AT 43 YEARS OF HOSPITAL MEDICINE

Having qualified at Edinburgh University in January 1943 I practised medicine for over 43 years, all of which, with the exception of the years in the Army, were spent in Hospital. As I approached retirement I took a backward look at these years and at the astonishing changes which had taken place.

48 years ago there was no National Health Service as exists today. Hospital staffing was very different. Small local hospitals were run by the General Practitioners; the teaching hospitals had Honorary Senior staff, generally a Physician and Assistant Physician, plus a Clinical Tutor and one House Officer per firm. In the Royal Infirmary of Edinburgh each medical firm had responsibility for 1½ wards, each with 28+ beds. The Consultant Physicians and the Assistant Physicians were in private practice and gave two hours of

their time daily from 11 – 1, five or six days per week, to look after the wards, do out-patient clinics and do the clinical teaching. The Clinical Tutors organised the teaching and did part of it, but sometimes not much more. The House Officer was the only fulltime member of staff and was appointed for six months – which meant exactly that, with no time off and in some Hospitals, such as the Royal Infirmary, no pay. I did my House Physician job there during war time, working an average of 124 hours a week, with no help except from one or two students during their vacation.

The load was heavy and the committment total but one learnt a lot about medicine, therapeutics, patient management and the practical aspects of side room investigations. The houseman not only took all blood specimens, but he did the haemoglobins, red cell counts, white cell counts, blood films, E.S.R.s and urine examination including regular urine microscopy. Admittedly the range of investigations, of drugs and of therapeutic regimes was limited but treatment could at times be much more time consuming than now, e.g., the acute asthmatic was likely to be treated with intravenous Aminophylline – as at present – and then if necessary subcutaneous adrenaline, 1 minim per minute, until their breathlessness was relieved which was often up to two hours – during which time you could do nothing else. Summaries of case records had to be written the night the patient went home, so that the Chief could write the discharge letter next day.

Joining the Army after such a six months was a physically demanding experience for a few days but one to which we all soon adapted and then enjoyed all the varied aspects of service life. 'Medicine' was very simple and on active service was mainly first aid and field hygiene. On taking up the threads of civilian medical life again, my years of training were spent in the Royal Infirmary with a year in the New York Hospital, (table I) until, in 1955 I moved up to Consultant Physician status and went into whole time University Medicine for 11 years, first in Jamaica and then in Uganda, before coming home to Stracathro Hospital in 1966. My early training had a definite cardiologic bias, and this interest persisted. At all times I was involved in undergraduate teaching, particularly when a University member of staff and in Edinburgh I did quite a lot of post graduate teaching in the Cardiology Section of the Internal Medicine course. My clinical approach to this day is based on these years in Edinburgh where I had the privilege of working under and observing the methods of Dr. A. Rae Gilchrist. There is little doubt that if you work for a particular person for some years, their standards, their methods, in fact their mannerisms are imprinted on you and the framework of your own future medical practice is subconsciously determined. Certainly the patterns of medicine and the standards to be achieved that I tried to instil into the students in the West Indies and in Uganda were Edinburgh patterns and Edinburgh standards.

What are the changes – for better or worse – that have occurred over the years? Probably the most important, at least from the hospital viewpoint, is the establishment of the National Health Service. This has made a high standard of hospital care available to everyone in this country. It has allowed a full time salaried hospital consultant service to develop and various junior training grades to be established to give practical experience under supervision to young doctors both from Britain and overseas. The great influx of overseas doctors coming to Britain to gain experience and higher qualifications could, almost certainly, not have occured without the Health Service. The ancillary services have also increased in range and in the facilities they offer. One only has to look at the present Ambulance Service, the Blood Transfusion Service, Physiotherapy, Pharmacy,

Occupational Therapy Departments, Orthopaedic Workshops, Dietetic Departments, Hospital Social Service Departments and so on, and to think back over the past 40 years, to appreciate the work they do, how essential they are and how much reliance is placed on them by the present consultant staff of the hospital service. These organisations and departments have developed and changed to keep pace with, and support the improving hospital service as its needs have changed. University Medical Faculties have also expanded their staff and departments, at least until recent financial cuts, and work alongside their N.H.S. colleagues in the teaching hospital, sharing the workload and the teaching. Also many more hospitals, such as Stracathro, now undertake clinical teaching and undergraduates have much more patient contact than 40 years ago. The use made of the medical hospital service by the public has increased steadily. (table II) Admissions to the medical wards of Stracathro Hospital also illustrate this (table III).

The second important point is that the population served has changed. It is older; social patterns have gradually changed; environmental hazards have altered; diet is possibly healthier and certainly more understood and the young are no longer subject to the gamut of childhood infectious diseases. Young adults can no longer be expected to have had measles, whooping cough, scarlet fever etc. The ageing of the population, coupled with changing social patterns, broadening of educational and employment opportunities, and ease of travel, has created a host of new medical and socio-medical problems. Medical advances, particularly the introduction of Sulphonamides and antibiotics, have added to them. The aged no longer die so readily, but survive as bodies often no longer able, mentally or physically, to care for themselves and the family environment is no longer geared to cope. Acute medicine is increasingly involving an older age group, particularly among women. The discipline of Geriatric Medicine has thus emerged alongside Internal Medicine and with it a continuously increasing need for assessment units, long stay wards, residential homes, sheltered housing, home helps and so on.

Smoking and drinking patterns too, have changed and have added their toll of disease with its demands on the community and on the hospital service. Knowledge of disease by the population and of certain risk factors has also increased. Womens' magazines seldom appear without a section on some aspects of health and Government Health Education Departments actively promote programmes aimed at altering some disease or undesirable social habit, so promoting social health and altered awareness of health. One cannot leave the topic of population without mentioning the immigrant populations who have brought many of the diseases of their home country with them and imposed these on their new environment. Some knowledge of these patterns and of the cultural and dietary habits of these people may influence the provision of services for the immigrants.

A third change is in the pattern of diseases. Some – acute rheumatic fever, acute nephritis, diphtheria and severe iron deficiency anaemia in pregnancy, have almost disappeared in this country. The acute infectious fevers of childhood have, as already mentioned, become relatively uncommon although some are still with us e.g., whooping cough and German measles, and tuberculosis is no longer the scourge it was. To go back to rheumatic fever, in the 1930's one in eight patients admitted to the medical wards of 4 Edinburgh Hospitals had rheumatic heart disease, whereas now, only a few are seen per year – 1 in 60 in 1970. After the second world war, surgery of rheumatic heart disease developed, initially only for those with a stenosed mitral valve which was split by the force of the surgeon's finger. Now artificial valves are put into the arrested hypothermic

heart, something that would not have been contemplated except by the visionary 40 years ago. Other diseases have become common e.g., bronchial carcinoma and coronary artery disease. Of great significance has been this emergence of coronary artery disease as a serious problem. The first clinical diagnosis in Scotland of myocardial infarction confirmed by autopsy was made by Dr. Gilchrist in Edinburgh in 1928. After the second world war, when anticoagulant drugs came into clinical use and their place in the acute infarction situation was being studied by controlled trials, it took 2½ years using six wards of the Royal Infirmary for us to collect 150 patients with acute infarcts. Then in the early 1950's there was a sudden explosion of incidence and several patients with acute myocardial infarcts might be admitted every day. The clinical severity of the disease also became more varied and treatment began to change. In the early years, patients with an acute infarct were treated in hospital for six weeks, the first four of which were spent in bed. During the first two weeks they were not allowed to do anything for themselves; they were fed, bathed, moved etc. It is not surprising that 25% got thrombo-embolic complications and that anticoagulants were beneficial. Contrast that with present day management when most patients are up within a week and home within two weeks, and the belief of many doctors that anticoagulation is unnecessary. The importance and frequency of sudden death at the onset, or within the first 48 hours of the infarct also began to be appreciated and the role of the Coronary Care Unit in allowing recognition and control of arrhythmias was developed. On a world wide basis, epidemiologic studies showed the possible relationship of diet to coronary artery disease and introduced the saturated/unsaturated fat controversy. It illustrates the value of epidemiology in the study of non-infectious disease. Continuing interest in the aetiology of atheroma and thrombosis and in its modification has shown that the disease trend can be changed. American incidence of clinical coronary artery disease is now on the wane – probably not for one single reason but for several – some of which are probably changing diet, changing smoking habits, increasing exercise, and possibly better treatment of hypertension. So, hopefully, Scotland will follow suit and move away from the top of the coronary artery world league table. To emphasise the unenviable position Scotland is in at present I would illustrate this from analysis of the cardiac problems of all patients admitted under my care during a 6 month period of 1985. Acute cardiac admissions accounted for 41% of male, 20% of female admissions and coronary artery disease was the main problem, accounting for 86% of the male and 81% of the female cardiac admissions. Taking established heart disease in the non cardiac admissions into account, showed that 1 in 2 of male and 1 in 3 of female admissions had present or past coronary artery disease. Rheumatic heart disease on the other hand was noted in 2 acute cardiac admissions and 4 patients with a non-cardiac illness, 6 out of 261 i.e., 2.3% of the total admissions.

Still on disease patterns, new diseases have been recognised e.g., chronic active hepatitis, auto-immune thyroiditis; new aetiologies have emerged – smoking and bronchial cancer, auto-immune diseases, slow virus diseases, hepatitis B and hepatoma, and so on; natural histories of disease have changed due to new treatments e.g, lobar pneumonia or acute leukaemia in childhood; new concepts of clinical response to disease or injury have been elaborated e.g., the stress response of the adrenal cortex to injury, infection, infarction, anaesthesia etc; and of course new methods of investigating and treating old and new diseases have developed, e.g., coronary angiography and coronary artery surgery.

Specialisation has of necessity become the order of the day. No longer can the Physician be knowledgeable and expert on all subjects. In fact, the general Physician is almost a thing of the past, just as the general Pathologist has disappeared and he, or she, is now a Physician with a special interest or a frank specialist with an extensive range of specialised knowledge on a narrow field. The Physician with a special interest is of course not new. In the teaching hospitals in the past physicians all tended to have a special interest, but with the expansion of knowledge the special interest that can now be expressed is more limited e.g., hypertension, congenital heart disease or coronary artery disease instead of cardiology in general. However it is essential that all but the few doctors who work in special institutes should have and maintain throughout their working lives a wide range of knowledge and experience. This is likely to be so as long as the Royal Colleges maintain their present M.R.C.P. examination patterns, standards and requirements; as long as courses are available and taken advantage of by the established consultants; as long as journals are read, students are taught and clinical discussion with colleagues takes place.

This change in emphasis towards specialization is undoubtedly beneficial and has facilitated the growth of new subjects e.g., genetics, immunology, virology and also the tremendous expansion of many established subjects. New techniques of investigation or treatment always create a resurgence of interest in what may have been a very static subject. It would take Mendel some time to grasp present day genetics, with its chromosomal studies, genetic engineering, H.L.A. patterns and so on. I cannot think of anything other than the basic techniques of history taking and physical examination that have not changed. Taking of blood is now done with sterile, disposable plastic syringes; blood counts are done electronically; the old haemoglobinometer has gone; E.S.R.s are done with a miniature tube; urines are tested with bits of special paper. Urine microscopy has not altered except to be seldom or never done by house physicians unless they are specifically instructed to do so. The beauty of urinary crystals is unknown to them. A doctor of 40 years ago, out of touch and coming again to medicine, would be quite lost.

Almost every condition, no matter what system it primarily effects, can now be investigated more fully and with greater precision and speed than 40 years ago. Automation in the biochemistry laboratory makes a screen of results rapidly available and many more are available on specific request. Also the scope of investigation has increased. Nuclear medicine has allowed hormone assays to be developed and scans of organs and of their functions to be done, e.g., we now diagnose thyroid gland dysfunction by thyroxine blood levels, T.S.H. levels, T.R.H. tests and possibly isotope scans and uptake, not by changes in the Basal Metabolic Rate. Radiology too has greatly changed and provides a more precise and wider range of information. Computerised axial tomography, whole body scanning, and nuclear magnetic imaging are non-invasive tools providing remarkable information about bodily anatomy and its abnormalities. Ultrasound studies also tell us about organ size and change in texture, about heart movement, heart valve activity, bile duct size, presence of gall stones, foetal size, number, development and so on. History and clinical examination are supplemented by an extra ordinary range of investigations so that less and less is left to the clinical acumen of the experienced Physician.

All changes have not been for the good however. Socially there was an upsurge in smoking during and after the second world war, and this was followed by an increase in alcohol consumption – both in females and males and in the range of drinks. With time, associated disease patterns began to emerge – bronchial caranoma, chronic bronchitis,

coronary artery disease, to mention the main ones and the acute and long term problems of heavy drinking. Epidemiologic studies clearly relate bronchial carcinoma to smoking and more recently to asbestos exposure. Chronic bronchitis, although smoking related, is also influenced by industrial pollution and improvements in that field have possibly lessened what could otherwise have been an overwhelming incidence of the condition.

Changing social and economic patterns and attitudes have also influenced the pattern of acute hospital admissions. The problem of self poisoning has emerged since the 1950's and is now the single most common cause of hospitalization in many city hospitals. 15% of acute admissions is now not uncommon. Hospitals and staff have to be geared to this. Out of the study of this problem in the large centres has grown nationwide expertise in handling acute poisonings and the realisation that no specific treatment is usually required, that simultaneous alcohol consumption is often a conditioning factor and that usually there is no suicidal intention, but that the overdose is either a cry for help or an impulsive gesture. Psychiatric treatment is needed by the minority and understanding parents or helpful social workers are more important. Stracathro experience of self poisoning fortunately does not equal that in the cities, but has been increasing over the years. (table IV). The pattern is similar to that in the cities, but a higher percentage have taken their overdose with avowed suicidal intent. It is encouraging to find that the increase in incidence appears to have levelled off.

As mentioned earlier, immigrant populations have also brought their own cultural, dietary and disease patterns and in many cities have brought new and interesting demands on the hospital service, e.g., T.B., has to be considered with much greater frequency, diabetes may be more difficult to manage and more common, parasitic disease may be present and nutritional deficiency e.g., rickets may be a problem.

Leaving investigative medicine and the new conditions and problems that have emerged, therapeutic advances must next be considered. Hospital facilities have improved and hospitals are now places to get better in instead of to die. Problems specific to hospitals may occur such as cross-infection and the lay out of Stracathro is probably one of the best for minimising this risk. Drugs have multiplied and are now available with a vast range of actions but also inter-actions and side effects. Infusion fluids and blood products have increased and are readily available but carry problems specific to them; many vaccines are available, sera have been virtually abandoned: oxygen therapy is better understood and applied: nursing aids and appliances have improved and ancillary methods of treatment e.g., by the physiotherapist, have changed from the traditional heat, massage and exercise days. Dietetic knowledge has increased and occupational therapy often has a role. Outside hospital, social support can be organised to maintain and improve wellbeing.

More than forty years ago the drug armamentarium was limited and there were relatively few genuinely active preparations. Good nursing care was of prime importance and of course still is. Sulphonamides had been introduced in the late 1930's and when I was a student were already changing the outcome of serious infection e.g., lobar pneumonia and meningitis. Diuretics were limited to the mercurials and had to be given by injection every second day, as if too much was given, mercury poisoning could result. Bedrest and Digitalis were the main treatment for cardiac failure. Powdered Digitalis leaf was still used and Digoxin was only just becoming popular. Barbiturates were the main sedative and a variety of the short acting ones were coming into use. Chloral Hydrate was

the usual alternative hypnotic. Students still learnt how to write and make up lengthy prescriptions, e.g., for expectorants, Syphilis was treated with arsenic, bismuth mercury injections and as syringes and needles were used repeatedly jaundice was a not uncommon complication of treatment; Magnesium Trisilicate was becoming the main antacid; Atropine, Hyoscine or Stramonium were the anti-cholinergics; changing the pH of the urine or giving intravenous Hexamine were the means of treating urinary tract infections. Gradually but with increasing speed, new drugs were developed. The list is now vast and the range is ever increasing. The number is exaggerated by companies producing their own particular band of drug e.g., the beta blockers and diuretics. If one looks to the future and to what may be one of the most significant new developments I would pick a drug which will turn on the activity of the brown fat cells in the obese subject without causing undesirable side effects. Such a drug could revolutionise obesity, probably the most common nutritional problem throughout the world, thereby cutting the incidence of obesity associated disorders e.g. maturity onset diabetes, and at the same time making a vast fortune for the successful company.

Most drugs when properly used yield considerable therapeutic benefit, curing or relieving the condition and in the elderly, prolonging life if not always improving its quality. However, new drugs create new problems of inter-actions, side-effects and adverse reactions. Some drugs never reach the general public or are withdrawn after a time due to the frequency of side effects or serious adverse reactions. All such reactions should be reported to the Safety of Drugs Committee so that the continued use of a drug may be monitored and if necessary doctors be warned of side effects or the drug be withdrawn. Clinical Pharmacology departments have developed out of the old University Pharmacology and Therapeutics departments and apart from undergraduate teaching have developed an important role, often contributing as much as drug companies to the understanding of absorption, metabolism and excretion of drugs and of how these vary with age or in the presence of other drugs.

Undoubtedly the potential for patient care has been greatly improved. I have tried to list what I think are the most significant advances as far as the General Physician is concerned that have either altered longterm morbidity and mortality or significantly altered immediate prognosis. These are:

1. Successful long term use of anti-hypertensive drugs.
2. New oral and intravenous diuretics.
3. Antibiotics.
4. Steroids – oral intravenous inhaled and topical.
5. Anti-coagulant treatment of deep vein thrombosis.
6. H2 antagonists.
7. L. Dopa.
8. Oral anti-diabetic agents.
9. Inhaled sympathomimetic preparations for relief of asthma.
10. Non steroidal anti-inflammatory drugs.
11. Cancer chemotherapy preparations.
12. Anti-anginal preparations.

To this list might be added the prevention of childhood infections by vaccines but this hardly comes into the field of the hospital physician. The development of specialized units might also be considered – renal dialysis, cardiac surgery, paraplegic centres etc., but these too are outwith the role of the general physician, except for referral of patients by him.

In diagnostic assessment significant tools are:

1. Technique of colony counting in urinary infections.
2. Bacterial antibiotic sensitivity testing.
3. Biochemical automation.
4. Hormone assays.
5. Use of Ultrasound.
6. CAT Scanning and isotope scanning.
7. Measurements of organ functions.
8. Improved radiologic techniques.
9. Endoscopy.

Medical student training must keep pace with the changes. New subjects and new aspects of old subjects must be covered. Anatomy and physiology are still basic requirements but the old emphasis on anatomical detail has surely gone, with the appreciation that in the long run great detail is unnecessary except to the specialist surgeons. Physiology has expanded greatly. Function of almost every organ is better understood; the immune defences and the coagulation mechanisms are only two systems that are much more complex than thought of 40 years ago; genetics involves an understanding of chromosomal patterns, how these can be damaged and the possible outcome. The importance of the H.L.A. system in disease susceptibility is also being more and more studied and understood. New aetiologies and new diseases have to be understood as well as the countless new drugs. Teaching staff have become more numerous particularly in the junior ranks and it is possibly too common for the juniors to do an undue amount of the clinical teaching. Reduction in numbers of students in a clinic is advantageous but not at the expense of quality of teaching. The keen student in a group of 20 will learn more from an experienced senior teacher than in a group of four or five with an inexperienced junior. One paradox of improving medicine is that more handicapped children are surviving into adult life yet little or no time is devoted to teaching the medical student about the handicapped. He becomes a doctor with little or no understanding of any particular handicap, of the trauma to the family, and of the problems they face; he can therefore give little or no advice and in many instances retreats into a defensive unhelpful position with no compassion, so perpetuating his and the patient's and family's difficulties – while other professionals still look to the doctor as the fountain of knowledge. Surely this is a field to be re-assessed by Medical Faculties.

Medicine is fast becoming more of a science than an art. The ultimate will be when each unit in every hospital has its computer. The facts will be fed in and the diagnosis or differential diagnosis in order of likelihood with the required investigations and treatment will be available in a few minutes. Clinical experience will count for little. BUT the computer is only as reliable as the facts it is given. Only a well taken history and careful examination can supply these accurately and I know only too well how the houseman's history may differ in many important aspects or in emphasis from the one I take myself. Detail that is often so important is not gone into. A sound basic medical training during undergraduate and early post graduate years is thus still the foundation of good medical practice. Teachers may possibly have to re-appraise their teaching methods, and spend more time on the basic skills of history taking and physical examination doing this themselves rather than delegating it to less experienced juniors. Lastly, and this is where clinical experience at the bedside cannot be replaced by the computer, the young doctor

must learn the skills of patient management – understanding and meeting the problems and needs of the patient, and possibly of the family, quite apart from diagnosing and treating the disease; realizing that he must not cause unnecessary distress, that he must stimulate the patient's confidence in his, the doctor's ability, and that above all he must be humane and compassionate.

House Physician Royal Infirmary of Edinburgh	1943
RAMC	1943-1946
Research Scholar Royal Infirmary of Edinburgh	1947-1949
Registrar in Cardiology RIE	1949-51
Research Fellow The New York Hospital	1951-52
Senior Lecturer in Medicine UCWI	1955-1961
Professor of Medicine Makerere University	1961-1966
Consultant Physician Stracathro Hospital }	1966-1986
Honorary Senior Lecturer in Therapeutics }	
Dundee University }	

Table I

Personal Career

1965	82,308
1970	88,460
1976	102,664
1981	119,983
1984	141,281

Table II

Scottish Hospital Medical Discharges. Day Cases are not included.

1961	970
1965	989
1970	1074
1976	1191
1981	1379
1985	1486

Table III

Medical Admissions to Stracathro Hospital

year	patients	% of Total
1961	7	0.7
1965	12	1.2
1970	34	3.1
1976	48	4
1981	81	5.9
1985	75	5

Table IV

Self Poisoning Admissions to Stracathro Hospital

The formal business ended with thanks to the speakers and afternoon tea, although some members remained in Dollar, taking advantage of the good weather, to visit Castle Campbell. This meeting brought to an end the activities of the Society in the 1990-1991 session.

The Scottish Society of the History of Medicine

REPORT OF PROCEEDINGS

SESSION 1991-92

THE FORTY THIRD ANNUAL GENERAL MEETING

The Forty Third Annual General Meeting, attended by 63 members and guests, was held on 2nd November 1991, in the Kelvin Conference Centre, Glasgow, with Mr. John Blair, the President, in the chair. The minutes of the 42nd Annual General Meeting were approved and the Treasurer's report accepted. One award from the Guthrie Trust was announced, a grant of £500 to Dr. Jacqueline Jenkinson to assist in the publication of her book on Scottish Medical Societies. It was announced that the Council of the Society proposed to add a fourth meeting to the Society's year, to be known as the Haldane Tait Memorial Lecture, in honour of the late Honorary President. The meeting would take the form of a lecture followed by a dinner. It was agreed that the inaugural lecture would take place in the spring of 1992. The President reported that the Society's bid to host the 34th International Congress on the History of Medicine had been successful and that the meeting would take place in Glasgow in September 1994.

Two new Council members were elected, Dr. Bryan Ashworth and Dr. Marguerite Dupree. Professor Girdwood, who was leaving Council, was warmly thanked for his contribution. All the office bearers were re-elected. Finally, it was reported that Council had agreed to raise the Society's Subscription. This had remained at £1 since 1958, but would now be raised to £7. The 43rd Annual General Meeting was followed by the 134th Ordinary Meeting.

THE ONE HUNDRED AND THIRTY FOURTH ORDINARY MEETING

The One Hundred and Thirty Fourth Ordinary Meeting was held in the Kelvin Conference Centre immediately after the 43rd AGM. The first paper was by Professor John Lenihan, who had taken as his subject James Maxwell Adams.

JAMES MAXWELL ADAMS 1817-1899
PHYSICIAN, FORENSIC SCIENTIST AND ENGINEER

James Maxwell Adams was a remarkably gifted medical practitioner of 19th century Glasgow. He was born in Edinburgh in 1817, a member of a medical dynasty which began in the 18th century and lasted, as far as I can discover, until 1967. He was the father of James Adams, who succeeded Macewen as surgeon to the Glasgow Royal Infirmary in 1892 and the grandfather of D. K. Adams, physician to the Western Infirmary of Glasgow. Many of his other relatives gave distinguished service to medicine and to public affairs.

Adams studied at Edinburgh University and qualified LRCSE in 1841. He moved to Glasgow in that year and soon built up a substantial practice, not only in medicine but also in toxicology, engineering and much else. He was active in the affairs of the Glasgow Medical Society, the Glasgow Medico-Chirurgical Society of which he was one of the 26 founder members, the Faculty of Physicians and Surgeons, the Ophthalmic Institute, the Glasgow Medical Mission Society and the Cowcaddens Mechanics' Institute.

In all of these activities he worked with great enthusiasm. An early example is found in the archives of the Glasgow Medical Society. Between 1814 and 1846 the minutes occupied 240 pages – 7 pages per year – and gave very little information. In the next year, after Adams had been elected Secretary, the minutes occupied 58 pages. In 1863, when he was President of the Glasgow Medical Society and Secretary of the Glasgow Medico-Chirurgical Society, he proposed that the two societies should amalgamate; this was agreed, and finally achieved in 1866.

He made a distinctive contribution to toxicology in 1865 in connection with the trial of Dr. Edward Pritchard, the last person to be hanged in public in Glasgow. Pritchard was accused of killing his wife and his wife's mother Mrs. Taylor. His wife's murder was a fairly straightforward case of antimony poisoning but the death of his mother-in-law had some additional features. Dr. Frederick Penny, Professor of Chemistry at the Andersonian University, was responsible for the chemical examination of various samples. When he found himself short of time he asked Adams to help by analysing some of the material found in Pritchard's house. The list of witnesses was by that time closed, so the work done by Adams is attributed to Penny in the official reports of the trial. Later they wrote a paper giving proper credit to Adams.

Mrs Taylor had been taking Battley's Solution, an opium preparation, prescribed by Pritchard. A bottle found in her pocket was examined systematically and appeared to contain aconite as well as opium. Aconite had a few uses in medicine but was seldom used as an instrument of homicide; A. S. Taylor recorded only one previous case. Pritchard had bought a large quantity of Fleming's Tincture of Aconite – much more than could be accounted for by the needs of his practice. There was no reliable chemical , but Adams made a series of experiments, the design of which could hardly be bettered today. By observing the effects on rabbits of doses of Battley's Solution, in the pure state and with various amounts of Aconite, he showed that the material given to Mrs. Taylor contained between 5 and 10% of aconite. George Macleod, afterwards Professor of Surgery in Glasgow, who was in court during the trial, said that these findings, presented in evidence by Penny, greatly influenced the jury.

Adams did a good deal of forensic work and submitted an impressive application for the chair of Medical Jurisprudence in Glasgow in 1872. His application was too late in reaching the Home Office; this was unfortunate for he would have made a better professor than the successful candidate, Pierce Adolphus Simpson, who occupied the chair for 26 years without making any visible contribution to the subject.

In 1866 Adams turned his attention to inhalation therapy, which had become popular in the management of respiratory diseases. The basic principle involved the use of a fast-moving stream, originally of air but later of steam, to entrain a medicated liquid and project it into the throat as a fine spray. In 1864 Dr. Siegle of Stuttgart described a device differing only in minor details from designs already known. He obtained a patent for his

inhaler, which was sold at in Britain – though only in small numbers – at 63 shillings. Adams bought a Siegle inhaler. Finding it inconvenient and dangerous in use, he made important improvements. Like many high-minded physicians of the time, he did not seek patent protection – or indeed any financial gain from his inhaler, which was made in Glasgow and could be bought for a few shillings.

An Adams Inhaler, in surprisingly good condition, was found in 1989. I have it here. It has many interesting features – notably the arrangement by which the steam, on its way to the atomiser, is dried by being superheated. In this way the elastic force of the steam at the point of escape is enhanced, with corresponding improvement in the efficiency with which the medicated liquid is entrained and propelled.

Several thousand Adams Inhalers were sold in Britain and overseas. Then Siegle claimed that the Adams design infringed his patent. His agents demanded – and often obtained – large sums by way of indemnity from users and retailers. They went further and claimed £2 from Glasgow Royal Infirmary as a royalty for each of Lister's carbolic sprays. At Belvidere Hospital Siegle's demands were so great that most of the Adams inhalers were scrapped. Siegle's agents then abandoned their original model, counterfeited the Adams design, labels, instruction leaflet and packing cases, overstamped each item *Siegle's Patent* and sold the device as their own. By 1878 the patent had expired and the inhaler was again made in Glasgow and sold under the name of Dr. Adams. The example shown to-day has the face protector, a modification introduced by Adams and first described by him in 1878.

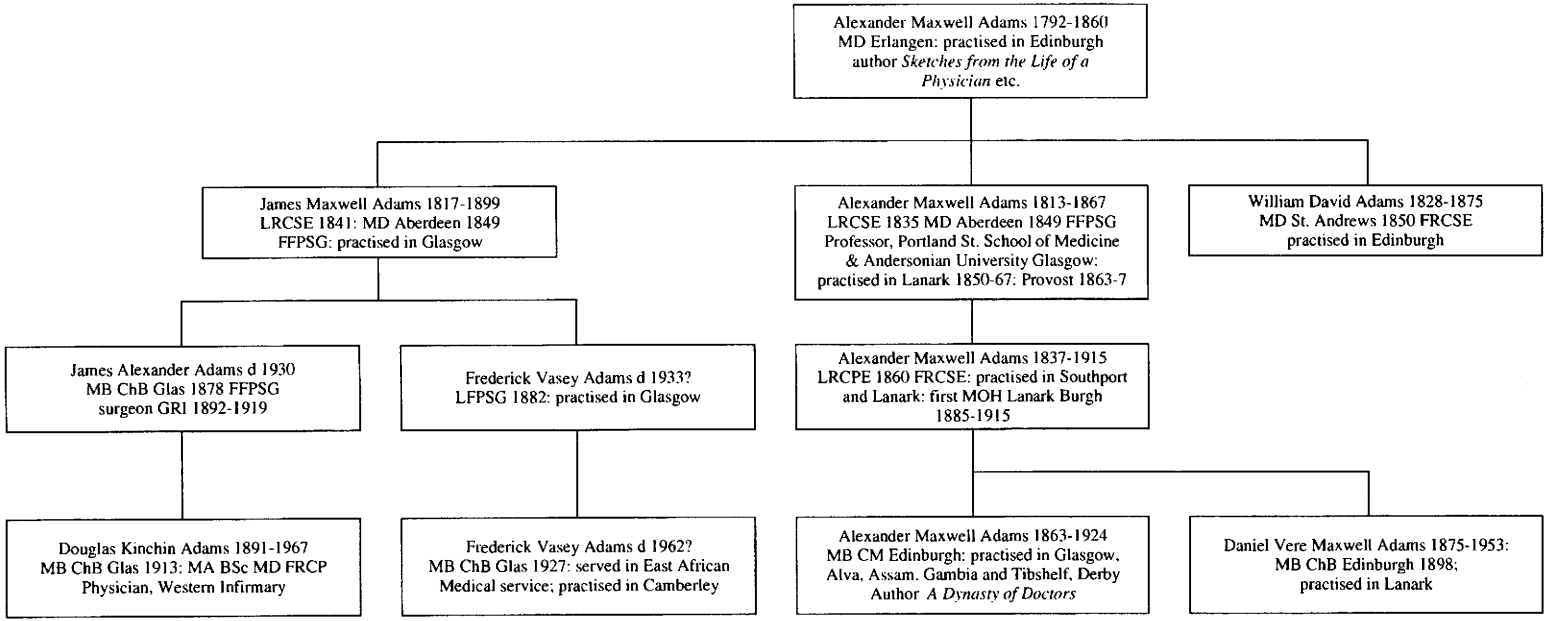
In 1855 Adams spoke to the Glasgow Medical Society on the subject of heating by gas and described a stove that he had designed. In 1880 an improved version was shown at an exhibition organised by the Glasgow Philosophical Society and gained the highest award in its class; the jurors reported that it was more efficient than any gas heater known to them. Adams wrote a number of papers on scientific and technical aspects of gas heating.

He had an extraordinary range of interests and expertise. In 1854 he gave evidence during a lengthy lawsuit which turned on the question whether a mineral newly found at Torbane near Bathgate, was coal. It is now recognised an an oil shale and known as Torbanite. Adams decided, from microscopic examination of sections which he made, that the mineral was not coal. The same conclusion was reached independently by John Quekett, the famous histologist.

Adams wrote at length on sanitary aspects of the sewage question (1868), chemical and nutritional properties of wine (1869), arsine poisoning (1876), cruelty in lion taming (1872) and sterilisation by steam (1883). He came close to financial ruin in 1879, after the collapse of the City of Glasgow Bank, in which he had a large shareholding. The demand made by the liquidators was beyond his means. He surrendered all of his assets and was absolved from further payments. A group of his friends bought back his house and presented it to him. He seldom attended meetings after 1880, and retired from practice in 1889, because of increasing deafness – but remained a frequent contributor to the Glasgow Herald on the work of Robert Burns and on a variety of other topics.

Adams was a fluent and forceful writer and an accomplished administrator. His achievements in medicine, toxicology and engineering were characterised by impressive grasp of underlying scientific and technical principles. If the much-needed compendium of biographical information on the practitioners of 19th century Glasgow is ever accomplished, Adams and his kinsmen will have a distinctive place in it.

THE ADAMS DYNASTY



Professor Lenihan's paper was followed by one from Dr. K. Liddell on the subject "Scottish Hospitals on Postcards". Dr. Liddell's comprehensive slide archive was appreciated by the audience, who suffered sudden attacks of severe nostalgia, as well remembered hospital buildings came into view. The Hospitals ranged from the Borders to the Highlands, with slides depicting austere functionality as well as bustling humanity, in the form of flower sellers, visitors and passers-by in hospital approaches. The slides and talk were accompanied by an exhibition which provided further enjoyment for members before the close of the meeting.

THE ONE HUNDRED AND THIRTY FIFTH ORDINARY MEETING

The One Hundred and Thirty Fifth Ordinary Meeting of the Society was held in the College Court of the University of Glasgow, on 21st March 1992, under the chairmanship of the President, Mr John Blair. It was attended by 60 members and guests. The President informed the Society of progress in arrangements for the International Congress of the History of Medicine in September 1994.

The first paper was given by Dr. William Bynum, the Director of the Wellcome Unit for the History of Medicine in London and was entitled "Controlling Hearts of Darkness". The paper discussed the influences of Nationalism and Internationalism at the Sanitery Conferences between 1851 and 1938 and was greatly appreciated by the audience, as was Dr. Bynum's wide selection of slides of distinguished medical men.

The second paper was by the Director of the Wellcome Unit for the History of Medicine in Glasgow, Dr. Johanna Geyer-Kordesch and was entitled "Storming the Citadel".

STORMING THE CITADEL: THE INTERNATIONAL CAMPAIGN FOR WOMEN DOCTORS

Storming the Citadel is an apt metaphor for how women entered the medical profession. Those defending the fortress were as fierce as those who laid siege to the idea that a woman's place was exclusively in the home. Needless to say both parties, for and against, were mixed: men and women shocked and opposed to the delicate sex wanting to wield a scalpel and dissect corpses; women and men stirred by the injustice of prejudice and medical monopoly. The battle raged so fiercely because everyone knew for a fact that, were the walls to fall in the medical profession, the principle would have been breached that denied women access to the professions. While university education and professional opportunities increased for men in the nineteenth century, nothing was done for women. The magical boundaries of the "Women's Sphere" were invented as a woman's proper place and sentimentalised in paintings and cameos of family intimacy in the nineteenth century.

These images and role models explain the tremors of shock that surrounded the *Septem contra Edinam*, the Seven against Edinburgh battle, as Sophia Jex-Blake in March 1869 led Mrs Isabel Thorne, Miss Edith Pechey, Mrs Evans, Miss Mathilda Chaplin, Miss Anderson and Miss Bovell into their 5 year struggle for the right to graduate in medicine. As Professor Laycock of the Medical Faculty expressed it: "for any lady, *that* was out of the question". (1)

Although women had been scholars and healers for centuries, the medical doctorates granted in the nineteenth century pushed open the doors of the universities and of an established profession for women. When the first handful of women won their degrees, domestic ideology was dented beyond repair. This ideological impact, rather than their small number, gives them an undeniable historical significance. The first women doctors have been diminished because they have been portrayed as better girl guides. But at issue was something far larger than medical practice itself: the rights of women to have jobs, earn degrees, and be paid. (2) What stood in their way was an array of strongly held views, particularly by doctors, that women's place was in the home, that women earning professional fees would demean the place of the (male) bread winner, that professional work (no-one seemed to care about agricultural or domestic labour) would unfit female bodies for bearing children, that medical knowledge would defile their natural purity and that intellectual work would end in neurosis. These opinions were so well documented in public pronouncements, the press, scholarly and medical journals that it should once more be impressed on the historical mind that it was an *ideology*, not a passing aberration lately corrected, that stood its sexist ground for at least a century against women doctors. (3) The professions, the universities, governments and public opinion changed exceedingly slowly and only under pressure. If this history is denied, it makes a doll's house out of a campaign that spanned Western Europe and North America and illustrates an amazing autodidactic (the universities were closed to women) ability to produce cogent arguments in the face of no mean opposition.

A short prelude to the international campaigns of the nineteenth century for education and degrees took place in the small Prussian town of Quedlinburg. In 1740 Dorothea Christiane Erxleben-Leporin (1715-1762) (4) petitioned Frederick the Great to let her attend the University of Halle. She was the daughter of the local doctor, who himself was an advocate of the educational reforms of the Enlightenment, and therefore saw nothing amiss in teaching his medical skills to a female. Well- prepared as she was, Erxleben-Leporin's professional hopes succumbed to the circuitous route of marriage and a family – she married a clergyman, a widower with four children and had five of her own – before she asserted her claim to be a physician on a par with male colleagues. These had forced her hand in 1753 by formally accusing her of quackery, which would have, after the state regulation of medical practice in Prussia in 1725, confined her to household duties. Sure of her own worth and her principles – she had written a book on the subject of why women were kept from studying, published in Berlin in 1742 – she submitted her doctoral dissertation and was examined on her medical knowledge in 1754. The degree was granted that year. Unfortunately she remained a unique example of Prussian liberal thinking when the equalitarian tendencies of radical evangelicalism (Pietism) could still be counted upon.

While German Romanticism saw an important contribution to intellectual life through the salons and publications of women like Rahel Varnhagen (1771-1833), Bettina von Arnim (1785-1859), Henriette Hertz and others, their influence was personal rather than public. (5) Their social sensibilities and arguments, like Rahel Varnhagen's against the limitations of being Jewish and a woman, or Bettina von Arnim's against social injustice (she wrote on the Silesian weaver's plight) could only be expressed in letters or books rather than direct political action.

The early nineteenth century saw a good number of middle and upper class women educated through university attendance, but barred, ironically, from regular study and

degrees. Two members of the same family, the mother Regina von Siebold and Charlotte von Siebold (1761-1859), her daughter, both midwives, received degrees in obstetrics from the University of Giessen (an honorary degree in 1815 for Regina and a full degree in 1817 for Charlotte). Charlotte von Siebold wrote her thesis on "Extra-Uterine Pregnancy". As an acknowledged expert in obstetrics she was asked to come to England to deliver the future Queen Victoria. (6) But, these notable exceptions brought about no broad structural or ideological changes for an educational or professional advance for women.

1848 saw another push for women's rights, but on the Continent the Metternich era restored Biedermeier domesticity or the frippery of love affairs. Women outside the moneyed safety of well-arranged marriages were disadvantaged by the industrial revolution or by the ghetto of their usual employment as domestic servants. Legally, crimes involving women, such as infanticide, suicide and murder were dealt with leniently (7), but they indicate the continued gender conflicts of the nineteenth century. Prostitution was policed (on the Continent), and on the rise.

One of the indications of the continual inability to grant women independence (an income of their own) and education (the means to practice a profession, especially in view of State and University regulation of qualifications) revealed itself after German Unification (1871), when the *Reichstag* delayed in committee some 30 years the repeated petitions to admit women to higher education. The barriers did not fall in the German Reich until 1908. (8)

Although Dorothea Christiane Erxleben-Leporin's doctorate in medicine became an isolated case, it was indicative of fundamental patterns that can be traced through European and North American attempts to establish educational and professional rights for women. Enlightenment ideology championed rationality, usefulness and education. Erxleben-Leporin tried to fit these ideals to the very real difference in women's obligations (the double burden of career and home). Her legacy was unconsciously taken up by Elizabeth Blackwell, the first woman in an English-speaking country to receive her medical doctorate (MD 1849). (9) Blackwell's non-conformist family (strikingly parallel to Erxleben-Leporin) equipped her for self- confidence in her abilities (although not credited as such, she was a fine intellectual, albeit self-taught) and motivated her toward ideals of social usefulness. She could not, however, be a 'woman' as it was then understood, when she pursued her medical education. Henry Blackwell, her brother, called her an 'intrepid biped' because he knew about her complete ostracism by both men and women in Geneva, New York, (she was not greeted, let alone invited to social gatherings) as she pursued medical studies. Unlike Erxleben-Leporin, however, Blackwell could look to political support.

Among Blackwell's friends and acquaintances were Harriet Beecher Stowe (1811-1896), author of *Uncle Tom's Cabin*, and keen human rights apologist; William Lloyd Garrison, the Abolitionist; the prominent feminist Lucy Stone (1818-1893), who was her sister-in-law (Henry Blackwell's wife); and Antoinette Brown (1825-1921), the first woman preacher in the USA, as well as being Samuel Blackwell's wife. Lucy Stone, one of the prime women's rights agitators of her time, and Antoinette Brown were amongst the first graduates of Oberlin College, Ohio, founded in 1833, the first institution of higher education to admit women and Blacks. The coupling of educational and economic outcasts such as women and Blacks was symptomatic: in the 1847 refusal of Harvard

University to admit "women and Negroes" the reason given was that both of these groups would devalue the Harvard degree. But in 1849 Blackwell received her doctorate. Not far from Geneva, New York, in Seneca Falls, the first women's rights convention was held in 1848. It is no sheer accident that the Seneca Falls convention, which grew from the articulate involvement of women in the anti- slavery movement, was close in time and place to the first medical doctorate. (10) Women's entry into medicine was first a political act and then one of 'opening a profession'.

Blackwell's sister Emily and a Polish-German emigrant, Marie Zakrzewska (11), whom the Blackwells befriended (Elizabeth spoke German, Marie no English, the latter ordering beefsteak in a boarding house because she could not think of breakfast), received their degrees in 1854 and 1856, respectively, from another liberal land-grant college, Western Reserve, in Ohio. Marie Zakrewzewska was chief-of-staff in Maternity in the Berlin Charite, the most eminent teaching hospital of its day, and would have been the first female member of the obstetrics faculty but was driven out by a smear campaign.

The pre-Civil War period of evangelicalism and Abolitionism corresponded well with pre-1848 radical thinking in Europe. The failure of the revolutions of 1848 in Germany and Austria were beneficial to medical women in several ways: those men fleeing political persecution, now scattered elsewhere, proved to be reliable on women's rights issues. Abraham Jacobi (1830- 1919), often accorded the title of Father of American Paediatrics, and obviously an accomplished doctor, was a pre-1848 Communist fleeing the crime of lese majeste in Germany. He was not afraid to marry one of the first woman physicians, Mary Putnam, and was part of the Blackwell's circle of friends in New York. Mary Putnam (1842-1906), of the renowned American publishing family, was the first woman to receive a medical doctorate from the University of Paris (in 1868). (12) She was the first scientifically minded of that pioneer generation, doing work on brain tumors. Other German medical men who fled after 1848 went to Zurich and Berne, Switzerland, where, as medical professors, they were instrumental in letting women study medicine. The first women graduate in Zurich was Nadejda Suslowa (a Russian), in 1867, followed by many others (Zurich was truly liberal), among them the first German national to receive her doctorate, Franziska Tiburtius. (13) In Bern Rosalie Somanowitch graduated first (in 1874), and there, after losing the battle with the Medical Faculty of Edinburgh, Sophia Jex-Blake won her degree in 1877. (14)

Elizabeth Garrett Anderson (1836-1917) graduated in Paris in 1870. (15) Her road to the medical doctorate drew its direction from the British initiative for women's education headed by Emily Davies (1830-1921), her girlhood friend. (16) Garrett-Anderson had been able to enter the medical register of Great Britain in 1866, the first woman to do so, because she qualified as a licentiate of the Society of Apothecaries. This, however, was not intentional on their part; they had inadvertently failed to include a sex-clause. It may be noted that the Medical College of Geneva and of Western Reserve University changed their admission rules to debar woman after their first laudable liberalism.

If one follows these determined careers of the pioneer generation of women doctors, it becomes quite clear that success was due to non-conformist Protestantism, international links in the anti-slavery coalition and the women's rights movement, the liberalism of 1848 and its rebirth in Switzerland and Paris, and the broad network of social reform in which women were engaged. Medicine, and not theology or law as academic and

professional disciplines, stood women in good stead (even though the majority of doctors were against them) because it was an eminently practical field linked decisively with the reform issues of the day.

The legislative side of the British regulation of medicine, on the other hand, was a retarding factor. The Medical Act of 1858 stipulated that no foreign degree would qualify anyone for the medical register. Until the 1870s all the medical doctorates won by women were foreign. Only in 1876, with the Russell Gurney Enabling Act, were women assured of medical legitimacy. This was the act of Parliament that enabled all medical corporations to examine women, notwithstanding any restrictions to be found in their charters. The King and Queen's College of Physicians, Dublin, was the first to do so. The first seven women, amongst them Sophia Jex-Blake, who presented themselves for examination, were successful, and joined the British Medical Register.

The list of hard won medical doctorates deserve augmentation by the elite list of those institutions who decisively discouraged women: besides Harvard, outright refusals were given at London in 1858: St Andrews in 1858/59; Cambridge and Oxford (without formal refusal, and as was said to Sophia Jex-Blake in regard to women attempting medical studies: "Even the most sanguine of reformers would advise against it") (17), all of the German and all of the Austrian universities until the end of the 19th century (because these were subject to government legislation which was not forthcoming).

Degrees are not all, even though the pioneer generation of women doctors received the best medical education available (Paris, Zurich, Berne) and all of them graduated with honours or near the top of their class. The most momentous hurdle was actual medical practice. Some women – it may even have been a not insignificant number, but no-one has taken the trouble, even in these demographically interested times, to study available class lists for Continental universities or indeed Scottish ones – had attended lectures and paid fees in medicine and other subjects. Male animosity was select: when it came to earning money and the independence connected with a good job the line was drawn. But not overtly, of course. As Abraham Jacobi publicly reminded his male colleagues, women were not trying to become another Virchow, Descartes or Leibniz, they were merely attempting to ply a trade and be paid for it. (18) This reminder of 1896 fell on stony ground as the substantial outpourings against women doctors in the medical press in every European country attest. The arguments against women practising medicine were highly sexually discriminating (19), that is, medical men sadly preferred gender-specific, biological arguments, such as: mental and physical incapacity due to menstruation; lack of general physical strength when compared to men; child- bearing and lactation; mental inferiority due to lack of brain size, in addition to the usual outcry that medical work desexed women. Biological determinism was, of course, not out of temper with an age attuned to eugenic thinking. Julius Pagel, a very prominent member of the medical faculty in Berlin, in his public lectures on medicine in 1905/06, pronounced that women doctors were only fit for one thing: to help in the hospital kitchens. By that time the evidence must have been considerably against him, had he taken any trouble over empirical data. Women doctors had been running successful dispensaries and clinics since 1857.

Prejudice was so keen, from New York to Berlin, that it was indeed a miracle of faith in the principles of human rights that women doctors came to practise medicine at all. None of them, in compliance with then current sexual taboos, treated male patients. But human

rights radicalism had its sure allies. First the Quaker ladies in New York came to Elizabeth Blackwell's Dispensary, the New York Infirmary for Women and Children, founded in 1857, and then those in dire need of help: the urban poor. Marie Zakrzewska emphasized that the poor are no less discriminating than the wealthy. The few pennies they have will be spent with more thought than by those for whom money is no object. Success bore Dr. Zakrzewska out. In 1865 the Blackwell sisters were able to augment their now thriving dispensary and hospital through the Medical College of the New York Infirmary for Women and Children which trained that score and more of women doctors who carried the work outward to other, similar institutions. Philadelphia with its radical Quaker legacy established the Women's Medical College of Pennsylvania in 1861, attached to its own hospital of 35 beds. Marie Zakrzewska built up the ever expanding and very successful New England Hospital for Women and Children with 46 beds and twelve maternity beds in Boston in 1862. Even though this was not a college, it afforded some of the best training available for women. In 1866 Elizabeth Garrett-Anderson opened St Mary's Dispensary for Women, also a success story, which became the New Hospital for Women in 1872. In 1877 the London School of Medicine for Women opened under the organizing efforts of Sophia Jex-Blake and Elizabeth Garrett-Anderson.

I wish now to return briefly to British events. The 1877 opening of the London School of Medicine for Women was possible because Sophia Jex-Blake had wrestled with the proverbial angel in Edinburgh. Professor Laycock, whom I mentioned earlier, expressed the majority opinion of the medical faculty there when he and they decided that ladies were not suited to medicine.

Professor Laycock must have been exceedingly blind faced with the charming Sophia Jex-Blake, of impeccable social credentials, who was, however, in her youth not 'a Kate Greenaway little girl'. (20) Sophia Jex-Blake, then 29 years old, was an experienced escapee from paternal tyranny. Her father had firmly opposed her search for an independent life and both her parents sought to bring her up as a model child. But: "[she] became ill, the malady curiously diagnosed as 'mental excitability"'. She was kept in bed and drawn about in a bath chair, and exhorted to be very quiet". (21) This is how, I think, independence grows in adversity. Sophia Jex-Blake's training in independence came as a teacher in Germany and then in her pursuit of the question of female higher education, when she went to the United States to research her book on this subject. She visited the independent colleges in the Midwest, amongst them Oberlin College, unique in its experiment of co-education of men and women. Eventually she gravitated toward medicine and found the most effective contacts she could have in the network of women doctors at the New England Hospital for Woman (headed by Marie Zakrzewska) and with Elizabeth and Emily Blackwell at the New York Medical College. After a brief and happy period at the Women's Medical College, she felt obligated to return to England, her mother having recently been widowed. In November 1868 she landed at Queenstown (Ireland) determined to pursue the battle for women doctors in Great Britain.

In 1866, two years earlier, Elizabeth Anderson had, by dint of major effort, both of persuasion, in order to be accepted in courses, and by her good preparation, been examined and received as a Licentiate of the Society of Apothecaries, who then, however, closed the gender loophole. It seemed that Sophia Jex-Blake would be attempting the impossible. Canvassing amongst those friends who were advocates of women's education,

such as Henry Sidgewick in Cambridge, showed that less than a glimmer of hope was to be gained in either London, Cambridge or Oxford. Despite this, Jex-Blake persevered, not least because one of the staunchest womanly 'reeds of steel' (to borrow Rebecca West's phrase), Josephine Butler, who had pilloried the 'double standard' of Victorian morals, urged her on. Josephine Butler wrote at this time "We must do all we can by working quietly and extensively on the hearts and consciences of men. I find no man of ordinary candor who is not easily convinced, but M. D.'s will be the obstacles. They hang together so". (22)

It was under these circumstances that Sophia Jex-Blake confided that her thoughts had "turned to Scotland" 23). I think it was the struggle with Edinburgh that changed opinion in Britain, mainly because Sophia Jex-Blake was not afraid of the publicity or of the press. She was argumentative and visible. In this sense her storming of the Citadel turned the tide.

Sophia Jex-Blake is also the medical historian of women's entry into professional medicine. Next to Elizabeth Blackwell's *Opening the Medical Profession for Women* (published 1895), taken from Blackwell's letters and diaries up to 1869, when she left America to return to England, (24), Jex-Blake's *Medical Women* (published 1886) records the second incisive stage of the movement. Dramatic as this chronicle is, it also contains a lucid insight into how the ideological patterns that kept women out were broken. Quite rightly, Sophia Jex-Blake names the Medical Act of 1858, the legislation that created the GMC and the British Medical Register, as specifically exclusive of women. After 1858 medical practitioners became legally synonymous with "a person registered under this Act". (25) To register it became obligatory to attend Medical Schools and to be examined *in Britain*. The Medical Act did *not provide* for the Medical Council to examine "on proof of competency the holder of foreign diplomas and all other who pursued a regular course of medical study". (26) Women could only study medicine abroad (the United States; somewhat later France and Switzerland as we have seen) and in Britain were expressly excluded from regular medical schools. The *Septem contra Edinam* battle was about one thing only: whether the University would grant degrees and provide clinical training for women and examine them. So it was squarely about a normal medical education that would lead to a normal medical practice. But this is where the medical profession showed itself a versatile and implacable foe. Behind the Riot at Surgeon's Hall in Edinburgh (where the lady medical students were pelted with mud); the legal battles (in Senate and Court of Session) to finally grant the degrees to those women the University had matriculated; illogical decisions (Edith Pechey being denied the class prize for chemistry because she was a woman) and the packing of committees to vote against women's admission to the wards of the Royal Edinburgh Infirmary, a suppressed fear came to the surface: that those delicate, sensitive and docile creatures cast into hooped skirts, whalebone stays and bonnets could prove to be able doctors.

With a great deal of truth Sophia Jex-Blake wrote in 1886: "We owed perhaps quite as much to our foes as to our friends". (27) The Edinburgh resistance paved the way for parliamentary action, as the "Committee for Securing a Medical Education to Women in Edinburgh" exercised its considerable influence on the government after the Edinburgh case was lost. The Edinburgh disaster became a considerable victory in 1876 as the Russell Gurney Enabling Act was passed, changing the Medical Act to let the Royal Colleges and Universities examine women. And on that cheerful note, when the lost battle in Scotland finally carried the day, let me end and thank you very much.

FOOTNOTES: STORMING THE CITADEL

An expanded version of this lecture will appear in: W. F. Bynum and Roy Porter (eds) the Encyclopaedia of Medical History (forthcoming).

1. Sophia Jex-Blake, *Medical Women. A Thesis and a History*, Edinburgh, W. Oliphant & Co., 1886, p. 72.

2. The older histories and biographies are exemplary on fighting prejudice, see: Josephine Butler, *The Education and Employment of Women*, London, Macmillan, 1868; Sophia Jex-Blake, *A Visit to Some American Schools and Colleges*, Macmillan, London, 1867; E. Moberly-Bell, *Storming the Citadel: The Rise of the Woman Doctor*, London, Constable, 1953.

3. Mary Roth Walsh, *Doctor Wanted: No Woman Need Apply. Sexual Barriers in the Medical Profession 1835-1975*, New Haven, Yale University Press, 1977; Johanna Geyer-Kordesch, 'Geschlecht und Gesellschaft. Die Ersten Arztinnen und sozialpolitische Vorurteile', in: *Berichte zur Wissenschaftsgeschichte*, vol. 10/4, 1987, pp. 195-205.

4. Heinz Bohm, *Dorothea Christiane Erxleben Ihr Leben und Wirken*, Quedlinburg (1965).

5. Hannah Arendt, *Rahel Varnhagen. Lebensgeschichte einer deutschen Judin aus der Romantik*, Munchen, Piper, 1981 (first ed. 1959); Ingeborg. Drewitz, *Bettina von Arnim*, Dusseldorf, 1969; Christa Wolff, *Lesen und Schreiben*, Darmstadt, Luchterhand, 1980: essays on Bettina von Arnim and Karoline von Gunderrode pp. 225-318. These essays are especially valuable for understanding the problems of talented women in the Romantic period.

6. Hurd-Mead, *The History of Women in Medicine*, pp. 475; 503 ff.

7. Lionel Rose, *The Massacre of the Innocents, Infanticide in Britain 1800-1939*, London, Routledge and Kegan Paul, 1986.

8. Polemical overview (not good on the Reichstag debate) with bibliography: Margrit Twellmann, *Die deutsche Frauenbewegung. Ihre Anfange und erste Entwicklung 1843-1889*, Kronberg, Athenaum Verlag, 1976; Richard Evans, *The Femininist Movement in Germany*, 1894-1933, London, Sage, 1976.

9. Elizabeth Blackwell, *Opening the Medical Profession to Women*, (reprint: New York, 1977); Ishbel Ross, *Child of Destiny. The Life Story of the First Woman Doctor*, London, Gollancz, 1950; J. Geyer-Kordesch, 'Vorkampferinnen im Arzteberuf. Der Einstieg der angelsachsischen Frauen in die professionalisierte Medizin des 19. Jahrhunderts' in: *Feministische Studien*, 1983/2, pp. 24-45.

10. For the inter-relationship of medical reform, the anti-slavery movement (human rights) and women's rights, see: J. Geyer-Kordesch, 'Sozialhygiene und Sexualreform. Die Kritik der 'Feministinnen' in England im 19. Jahrhundert' in: J. Reulecke und Adelheid Grafin von Castell Rudenhausen, *Stadt und Gesundheit*, Stuttgart, Franz Steiner Verlag, 1991, pp. 257-270; Blanche

Glassman Hersch, *The Slavery of Sex. Feminist-Abolitionists in America*, Chicago, 1978; Ellen Dubois, 'Women's Rights and Abolition: The Nature of the Connection' (S. 238-251), und Blanche Glassman Hersch, 'Am I not a Woman and a Sister? Abolitionist Beginnings of Nineteenth- Century Feminism', (S 252-286), both in: Lewis Perry and Michael Fellman (eds), *Antislavery Reconsidered New Perspectives on the Abolitionists*, Baton Rouge, 1970.

11. Agnes Vietor, *A Woman's Quest, The Life of Marie Zakrzewska*, London, 1924.

12. Mary Putnam-Jacobi, *Mary Putnam Jacobi*, M. D., *A Pathfinder in Medicine*. With selections from her writings and a complete Bibliography. New York, Women's Medical Association of New York City, 1925; Rhoda Truax, *The Doctors Jacobi*, Boston Little and Brown, 1952.

13. Christa Lange-Mehnert, "Marie Heim-Vogtlin und Franziska Tiburtius: Erste Arztinnen im Zeitalter der naturwissentschaftlichen Medizin. Motive, Hintergrunde und Folgen ihrer Berufswahl", (Medical dissertation, University of Münster, 1988).

14. Margaret Todd, *The Life of Sophia Jex-Blake*, London, Macmillan.

15. Jo Manton, *Elizabeth Garrett Anderson*, London, Nethven, 1965.

16. Daphne Bennett, *Emily Davies and the Liberation of Women 1830-1921*, London, Andre Deutsch, 1990.

17. See the interesting correspondence, printed pp. 218- 231, in: Margaret Todd, *The Life of Sophia Jex- Blake*, London, Macmillan, 1918.

18. Johanna Geyer-Kordesch, 'Geschlecht und Gesellschaft', in: *Berichte zur Wissenschaftsgeschichte*, vol. 10/4, 1987, p.197-98.

19. The following facts substantiated in J. Geyer- Kordesch 'Geschlecht und Gesellschaft' (see above).

20. E Moberly Bell, *Storming of the Citadel*, 1953 p. 63.

21. Ibid.

22. Mary Todd *The Life of Sophia Jex-Blake*, p. 226.

23. Sophia Jex-Blake, *Medical Women*, Edinburgh, 1886, p. 70.

24. Ishbel Ross, *Child of Destiny*, 1950, p. 282.

25. Ibid.

26. Ibid.

27. Sophia Jex-Blake, *Medical Women*, Edinburgh, 1886, p. 106.

THE FIRST HALDANE TAIT MEMORIAL LECTURE

The First Haldane Tait Memorial Lecture and Dinner was held in the Royal College of Physicians of Edinburgh on the 29th May 1992. It was attended by 40 members and guests who included Mrs. Barbara Tait and members of the Tait family.

The President, Mr. John Blair, asked members to stand in memory of Professor David Waddell, whose death had saddened the Society so very recently. Mr. Blair then introduced Dr. Alastair Masson. Before beginning his lecture, Dr. Masson paid a moving tribute to the memory of Dr. Haldane Tait, whose dedication to history of Medicine in Scotland was an inspiring example.

THE FIRST HALDANE TAIT MEMORIAL LECTURE
JOHN DE MEDINA AND THE SURGEONS

The Scottish Society of the History of Medicine owes an immeasurable debt to Haldane Tait. He was a founder member and its first Secretary. Then, as Secretary, Vice President, President and Honorary President, he organised, guided and inspired its affairs over a period of forty years. He brought his own unique style to the Report of Proceedings, especially its Notes and Comments section, which allowed his encyclopaedic knowledge of medical history full rein. We remember with affection the warmth of his personality, the erudite and informative contributions he made to discussions and his hearty, cheery greetings on the telephone.

It is, therefore, with a mixture of sorrow and pride that I stand here today, sorrow that he is no longer with us and pride that you have done me the honour of inviting me to give the first of these eponymous lectures in his memory.

You all know the Royal College of Surgeons of Edinburgh and the many oval portraits on its walls with dates around the 1690s or 1700. It is about this unusual group of people that I wish to address you – unusual since almost all collections are of famous or notable people, but this group comprises almost all the surgeons of the day.

The story behind the portraits starts in 1694. In that year, two things happened. The painter, John de Medina came to Edinburgh and the physician, Archibald Pitcairne wrote to a friend in London to say that he was "taking part in an effort to obtain subjects for dissection from the Town Council".

In November 1694, the Incorporation of Surgeons, no doubt pushed by Pitcairne, petitioned the Town Council for bodies for dissection and the Council granted them "the bodies of foundlings who die betwixt the time that they are weaned and their being put to schools or trades" but stipulated that this was expressly upon condition that the petitioners shall "befor the terme of Michaelmas 1697 years build repaire and have in readines ane anatomicall Theatre where they shall once a year (a subject offering) have ane publick anatomicall dissection as much as can be showen upon one body. And if they failzie thir presents to be voyd and null".

That gave the Surgeons a deadline of just under three years but, for eighteen months, nothing much happened. Then, on 2nd June 1696, a committee was appointed consisting

of the deacon (or President), the Boxmaster (or Treasurer) and seven members of the Incorporation. It was instructed to proceed with commissioning a new building to contain an Anatomical Theatre. Plans were submitted by Mr James Smith who received a guinea and a glass of wine for his trouble. The foundation stone was laid in August 1696 and the building was ready for occupation at Michaelmas (September) 1697. In addition to the Anatomical Theatre, it had a splendid Convening hall, 35' x 20', a Laboratory of three rooms and a bagnio, or bath house. It was situated in High School Yards near where the Royal Infirmary was later to be built.

It was undoubtedly a source of pride to the Surgeons but also it became a source of considerable anxiety, especially to the Treasurer, Walter PORTERFIELD, and his successors, such as David FYFE, George DUNDAS and others. The building cost 500 pounds, exclusive of glass work and furnishing but this was a great burden because there were only 25 – 30 Surgeons in all. Their quarterly dues were enhanced by the dues paid by the Barbers but when the Barbers seceded in 1722 financial difficulties became so acute that the building was actually offered for sale. Fortunately, there were no applicants.

But what has all this to do with Medina or the portraits? Well, the completion of the building had several important consequences. In the first place, the Surgeons created a Library. It was started with books donated both by members of the Incorporation and by others. The first Librarian, James HAMILTON, was appointed in 1700 and a formal set of rules proposed soon after this. Walter POTTER was Librarian from 1703 to 1706.

Secondly, they created a Museum. It was the result of an appeal for "all naturall and artificiall curiosities" and some of the items donated were indeed curious – a large African gourd, a large eel skin stuffed, a pair of cock spurs, "clecked in Fife, prodigiously long", and an Italian padlock for women. None of these items has survived.

Thirdly, the idea of an art collection evolved. John de Medina was now established in Edinburgh and the Surgeons realised that a collection of portraits would be a splendid addition to the new Convening Hall.

Sir John Baptiste de MEDINA, the last man to be knighted in Scotland before the Act of Union, was born in Brussels in 1659. His father was a Captain in the Spanish Army, serving in what was then the Spanish Netherlands.

He received his early tuition from a Flemish portrait painter and he married a Flemish wife who bore him no fewer than twenty children. In 1686, he moved to London where he succeeded in attracting the patronage of the first Earl of Melville and his son, the Earl of Leven and he was induced by Leven to go to Scotland where he painted the portraits of many of the Scottish gentry. His methods sometimes were a little unorthodox. Before he came to Edinburgh, it was recorded that he had "two (men) bussie at work doeing the drapery of some pictors to take along with him. Any that desire to have their pictors finished so long as he is in Scotland would advertise him quhill here wuhat size etc and by this means he will have little to doe except the face and neck".

How the idea started is not recorded. The surgeons probably already had two paintings in their possession, those of William Borthwick and his father-in-law, James Borthwick. (These are the oldest paintings in the College.) But there are grounds for believing that Pitcairne was the first to have his portrait painted by Medina at a cost of five pounds sterling, this being followed by portraits of the other surgeons concerned. The dates on the

paintings were the dates of admission to the Incorporation, not the date of painting. They were painted between 1694, the time Medina arrived in Edinburgh, and 1710 when he died – and one can probably narrow that down to between 1698 and 1708.

Medina's self portrait is inscribed, in Latin, to the effect that, after painting the learned surgeon-apothecaries from the life, he executed his own portrait, at their request to accompany the set. After he died, a few were painted in similar style by his chief apprentice, William Aikman. So the College today possesses 32 portraits by Medina (of whom 29 were surgeons) and another five similar ones probably by Aikman.

These 34 surgeons, along with Medina himself, form the subject of my talk and the questions I shall address are who were they, what did they do and what was their standard of living. First what kind of people were they?

Two of them were doctors, James Nisbet and Archibald Pitcairne. Pitcairne was perhaps the outstanding medical figure of the time. The youngest founder member of the Royal College of Physicians, he was a man of wide culture and great learning. At a time when Leiden was the leading centre for medical education, Pitcairne was appointed Professor of Medicine there. One of his pupils there was the great Hermann Boerhaave and another was John Monro, father of Alexander Monro Primus. For family reasons, however, he resigned this post after only one session. He fell out with the Physicians in 1695 and became a member of the Incorporation of Surgeons.

At least two of the other surgeons had been to Scottish Universities. Alexander NISBET, who was the son of Dr James Nisbet, was an MA, probably of Edinburgh University while Adam Drummond spent three years at St Andrew's University before starting his apprenticeship. But the number of matriculates would be much increased if one included foreign universities. About one third of all the surgeons went abroad "for their improvement", a practice actively encouraged by the Incorporation. Most went to Leiden but some went to Padua or Paris, which was probably the surgical Mecca of the day. Many visited several centres though they did not always matriculate. One John JOSSIE spent as much as six years abroad. Little is known about Jossie since he seems to have died as a young man, only six years after admission, though his father was a well-known surgeon.

At least five of the surgeons were related to the gentry or to landowners, men such as Alexander Monteath, John Monro, Adam Drummond of Megginch, Gideon Eliot and Robert CLERK, youngest son of the first Sir John Clerk of Penicuik (Painting by Aikman, a relative). Robert Clerk studied abroad but exactly where I do not know though it might well have been Leyden. His nephew, also Sir John Clerk, went there later and was treated by Boerhaave for smallpox. He (ie the nephew) had a serious injury when he was 13. He was thrown from a galloping horse and his tibia was shattered, taking many months to heal. He later wrote that "Had it not been for the extraordinary care of my uncle who is a very expert surgeon, I must have lost my leg". Robert Clerk's son, Dr John Clerk, became President of the RCP of Edinburgh in 1740.

Six were related to Burgesses of the City and five were the sons of merchants. Four followed their father's footsteps in becoming surgeons while two were the sons of ministers. The father of one was a Senator of the College of Justice. John CHEYN's father was Town Clerk of Leith and he is interesting in that a descendant of his, also a fellow of the College, was the man who with William Stokes gave his name to Cheyne-Stokes

respiration; and Alexander EDGAR is described in the Burgess Roll as the "present Provost of Haddington". He was admitted in 1697 not long after the William and Mary Statute had extended the jurisdiction of the Incorporation to include the Lothians and the south east of Scotland.

The most senior surgeon at the time was Hugh BROWN whose story illustrates some of the problems of the times they lived in. In 1688, he had been honoured by James VII by being appointed Surgeon Apothecary to the King but, seven years later, he was threatened with imprisonment for what had become the crime of attending a Roman Catholic service. A report stated "This day, being Sunday, the Catholics of Edinburgh (who included Brown and his son) were so bold as to hold a meeting for worship in their Canongate". As a consequence, the Browns were ordered to give bond to an assurance that they would "do nothing offensive to the Government in future", on pain of imprisonment. The harassment continued for Hugh Brown's name is recorded in a list drawn up in 1704 of "Papists within the bounds of the Presbytery of Edinburgh". For all that, Hugh Brown was a distinguished and prosperous surgeon.

His son James, like Pitcairne's son, was involved in a treason trial. The Earl of Melfort, a Jacobite exile, was tried in Edinburgh in his absence. Those who had been in France with him, including young Brown, were given full remission on condition that they testified against him. Melfort and two others had "Sentence and Doom of Forfeiture pronounced by the Dempster of Parliament and Intimat with Sound of Trumpet". The threat implicit in his appearance before Parliament was apparently enough for young Brown because, in the same Census of Catholics within the Presbytery of Edinburgh, his name appears as "apostate papist".

Education

All the surgeons, of course, had completed a five year apprenticeship, had passed the examinations and had become Burgesses of the City. There was no lack of volunteers to become apprentices but few finished the course. The drop-out rate was very high. Of the sixty to a hundred apprentices whom one might expect to be taken on in a decade, only twenty or so were admitted, but whether this was because of the examinations or some other reason is not clear.

Few sat the exams until several years after completion of apprenticeship. The average delay seems to have been about five years, sometimes nearer ten, so that the young Surgeon was usually a man in his late twenties or early thirties.

The educational trend of the times was towards more formal tuition by lectures and this was evident in botany, chemistry and anatomy, three of the principal subjects in the curriculum.

James Sutherland, the first Professor of Botany, had an arrangement with the Surgeons that, on payment of a fee of one guinea per person, he undertook to teach apprentices and servants "at such hours as the masters should appoint". He would demonstrate the plants and conduct "a solemn public herbarizing in the fields" four times a year. Sutherland was succeeded in 1705 by Dr Preston who cannot have been exactly popular for his summer classes were conducted every day from five o'clock till seven — am! The surgeons complained that the apprentices and servants frequently "make a long stay from their

masters' shops" and to prevent this, the five youngest masters, John LAUDER and Robert GEDDES among them, were ordered to go, in turn, to the Physic Garden at 4am each day to make sure the apprentices attended and did not dally.

Alexander Monteath, a friend of Pitcairne, who had been Deacon at the time the new Surgeons' Hall was built, was quick to make use of the laboratory it contained and he began almost immediately to give lectures on chemistry. This was another consequence of the new Surgeons Hall but the most important of all was the change in the teaching of anatomy which resulted.

It would seem that no public dissections took place until 1702. In that year, the body of a David Myles who had been executed for incest was made available. A public course of dissections was arranged and the Deacon (or President), opened the proceedings with a general discourse on anatomy and a demonstration of the abdominal musculature. Seven other surgeons followed on different topics on subsequent days, ending with an epilogue by Pitcairne. A year later, a similar public dissection was arranged but it was spread out over ten days, with ten different surgeons, including Robert Eliot, taking part.

In 1705, Robert Eliot was appointed "public dissector by the Surgeons and was thereafter made Professor of Anatomy at a salary of fifteen pounds per annum. Three years later, he applied to have Adam Drummond appointed jointly with him and, when Eliot died in 1715, John McGILL was made joint professor with Drummond.

Four years later, in November 1719, Alexander Monro passed his final exams and was admitted as a surgeon and, eight weeks after that, both Drummond and McGill resigned simultaneously, on the grounds that the state of their health and business were such that they could not "duly attend to the professorship". They and the whole body of Surgeons unanimously recommended Alexander Monro, then aged 21, as Professor of Anatomy and he was immediately appointed. So the Monro dynasty began, the way obviously having been very carefully prepared. What followed then, of course, was the establishment of the Faculty of Medicine at Edinburgh University.

To return to Drummond and McGill, DRUMMOND was fairly typical of the landowner's sons. He went to school at Errol before going to St Andrews University for three years. After completing his apprenticeship, he went to study anatomy in London before going to Leyden. He really wanted to go to Paris and wrote to his father that a year in Paris was worth more than seven years in Holland to a Surgeon. His father, however, refused him permission perhaps because of the political climate there.

The Drummonds were staunchly anti-Jacobite. Their subsequent support for the Hanoverian cause was shown in 1745 at the Battle of Prestonpans. After the battle, surgeons from Edinburgh attended the wounded each day, returning to Edinburgh in the evening. One of the apprentices, a nephew of Adam and his apprentice, was entrusted to carry a saddle bag containing 400 guineas to Captain Adam Drummond, then a prisoner in Queensberry House in the Canongate. Captain Drummond, another nephew, was an officer in the Hanovarian army and Paymaster to his regiment and the money was pay for his troops.

The other joint professor, John McGILL (painted by Aikman) was twice Deacon and, in 1725, he was appointed "Apothecary and Druggist to our Royal family and forces in that part of our Kingdom called Scotland" by King George I, an appointment confirmed by

George II in 1728. In 1729, when the Infirmary first opened its doors, McGill was one of the Surgeons appointed to the hospital.

What Did They Do?

Apart from teaching and examining, the duties of a surgeon-apothecary of the time were laid down in the Statute of William and Mary of 1694. Surgeons were "solely and wholly to have power to cure all kinds of wounds, concussions, bruises, fractures and dislocations, contusions, tumours, ulcers and all such accidents arising therefrom" while physicians had the monopoly on "all diseases of an internal origin". They were supposed to compound only medicines for surgical and external application, although the William and Mary Statute allowed them to use internal remedies provided the disease or illness arose from an external cause.

But the physicians certainly kept a look out for what they saw as poaching. James NISBET was fined five pounds sterling by the Physicians for "his having undewly and illegally practised medicine". Nisbet appealed to the Court of Session and there were claims and counter claims and prolonged litigation before it was eventually resolved. In his defence, Nisbet said he had been called to see the girl who was 'in extremis'. She would not send for a physician, he said, adding "nor in that season of the night could expect one" so he did what by the blessing of God, recovered her to perfect health".

Probably all the surgeon-apothecaries except those who were also physicians had a shop, usually described as a "merchant booth". These were distributed mainly along the High Street but some were in the Canongate or elsewhere in the city. In the shop, they dispensed drugs both for themselves and the doctors.

Some examples of the type of prescription and the charges are to be found in bills submitted by Surgeons to the Town Council for the treatment of the poor in the year 1710 and bills submitted to Trinity Hospital. They include fomentations and plasters (which cost from 12/- to 16/- scots) for external application, but also purges (16/-), vomiters £1 16/-), pectoral electuaries and diuretic mixtures (£1), despite the William and Mary Statute.

Wounds, from civil and military causes, were certainly a major part of the work of the surgeons. Examples include: The "curing of a large wound in the forehead with plaster and all things necessary for the space of a month being dressed every day" – ten pounds. The curing of a bite by a dog on her leg being dressed eight weeks with plaster, ointment etc – ten pounds. The curing of a complete fracture in the arm £10, the curing of a fracture in the leg, twelve pounds and reduction of a dislocation one pound, ten shillings. One surgeon was called upon by the Town Council to treat a workman who was badly bruised and dangerously ill through a fall of a brae upon him during the making of a new road to Leith.

Actual surgical intervention was, of course, limited – the commonest by far being blood letting which, curiously, is frequently recorded without any charge. But there are some gruesome examples of major intervention. Sir John Clerk's father had the misfortune to develop a large boil on his back which proceeded, as the account says, to mortification. "The ablest surgeons in Edinburgh" treated him by progressively cutting away the "black mortified bits" until the wound was 9" long 5" wide and 3"deep and he suffered terribly and in the bill for the poor is the item "amputation of a leg with all things necessary" £ 40, followed by "Timber leg" £3.

Other major surgery was performed. John McGILL, sometime joint Professor of Anatomy, cured a traumatic aneurysm of the brachial artery in the newly opened Infirmary in 1730, but the apothecaries noted about 1700 that "there is not a surgeon in town that will offer to cut or cure the stone".

Midwifery was a part of the work of some surgeons. In what must be one of the earliest references to male midwives in Britain, James HAMILTON, was described by Sir John Clerk, as a man "much employed in midwifery". Hamilton was the son of a minister and it was he who was the first Librarian, and Deacon at the first public Anatomical dissection. He attended Sir John Clerk's first wife when she died giving birth to their first child, along with Dr. Hackitt (FRCP) and Sir John's uncle, Robert Clerk. "They took all the pains about her they could think of but I am afraid they were too hasty in their operations by which she lost a vast deal of blood. The placenta, it seems, was adhering to the uterus and this they thought themselves oblidged to bring away by force". In fact, the baby was delivered at seven in the morning and the manual removal was not undertaken until nearly ten in the morning, when Sir John observed that his wife was very distressed.

There was a sort of forensic case when a man died from a fall from a stair. A surgeon was "appointed to sight the corps". The problem was that a servant was arrested on suspicion of murder but was subsequently released. Death itself could be quite lucrative. A bill submitted to the Marchioness of Douglas came to £194-11/- for drugs and treatment in the last fortnight or so of her life but £266-13/4 was charged for embowelling, embalming and lotions, oils and sweet oils for the coffin. Finally, they quite often carried out post mortem examinations, especially on the gentry.

Until well into the 19th century, the Surgeons took part in the administration of the Burgh. The Town Council was made up of merchants and the crafts, of which the Surgeons were the principal guild. The Deacon served on the Town Council during his two years of office and took an active part in the affairs of the City. About one third of the surgeons painted by Medina became Deacon at some time, some on more than one occasion.

John KNOX, who was Deacon in 1715 at the time of the Jacobite rebellion, was appointed by the Town Council to a Committee to do everything necessary for the safety of the place and the preservation of the peace "when the enemies of His Majesty's Government threaten to raise mobs and tumults"; and Alexander SIMPSON who was on the Council as Trades Councillor and not Deacon travelled to London in 1709 in connection with a proposed dock at Leith. Being Deacon, however, was not always sought after. Two of our group were elected and refused office. Gideon Eliot was fined 300 merks (about 15 sterling) and ordered to be imprisoned or have his goods poynded until he paid and Robert Clerk was temporarily banned from meetings for his refusal.

Five of the surgeons painted by Medina or his apprentices were at some time in the army while another, John KNOX, was "Chirurgeon in the Castle". John BAILLIE was commissioned in 1679, Surgeon Major to the 3rd Scots Foot Guards (Scots Guards) which fought at the Battle of Bothwell Brig in that year. He managed to combine military service with civil life. While he was still in the army, he was elected Deacon of the Incorporation in 1687 but in 1688 all Town Council meetings were postponed "in respect of the present juncture of affairs anent the Hollanders invasion". The local militia were called out and, this time, Baillie did have to go with his regiment. The Town Council minute of October 1688 noted that Baillie was "presently out of the kingdom on His

Majesty's Service". One battalion went to London and another to Salisbury with the King but, when William of Orange landed, the Scots Guards and the other regiments went over to his side. Protestant officers deserted in such numbers that James was not able to commit his army to battle.

A few months later, Baillie was back in Edinburgh. He happened to be in the Lawnmarket one Sunday morning when the Lord President of the Court of Session was shot from behind on his way home from church. A musket ball penetrated his chest and Baillie probed the wound but in vain for it was fatal. John Chielsie of Dalry, who with an unfortunate who was not involved, achieved the dubious distinction of being the last people to be judicially sentenced to be tortured. This was to find if he had any accomplices. Ten days later an Act was passed making torture illegal. After it was ascertained that he was acting on his own, he was sentenced to have his right hand cut off prior to being hanged.

Gideon ELIOT (not Robert, the Professor of Anatomy) was another army surgeon. He had matriculated at Leyden and became a Freeman Surgeon in 1689. He was evidently a Presbyterian because he joined the newly formed Cameronians as Surgeon. It is likely, therefore, that he saw service almost immediately when the Cameronians, in their first action, defeated the Highlanders who had, under Claverhouse, Bonnie Dundee, defeated King William's troops at Killiecrankie just a month or so before.

A few years later, when he was Deacon, he and the physician Sir Thomas Burnet went to the Hirsel, the residence of the Earl of Home, who had been put under house arrest. Eliot and Burnet were asked to report on the Earl's health, specifically as to whether or not he was fit to be removed to Edinburgh Castle to be imprisoned there. For this Burnet was paid 200 merks, but Eliot was only paid 100.

John MONRO was also in the army. (Picture by William Aikman 1715) His father was Sir Alexander Monro, a landowner and Commissioner for Supply in Stirlingshire, member of parliament and Clerk to the Royal Commission of enquiry into the events at Glencoe. At the age of 16, he was bound as servant and then apprentice to William Borthwick. On completion of his apprenticeship, he travelled to Leyden where he matriculated and stayed for two academic sessions.

Monro then returned to Edinburgh and was commissioned in the 22nd Regiment of Foot which proceeded almost immediately to the Netherlands in the army commanded personally by William III. Later, he served in Ireland but in 1700, he left the army and settled down in Edinburgh. He passed his examination and was admitted to the Incorporation in 1703.

His son, Alexander Monro Primus, was informally apprenticed to him and father and son attended the wounded at the battle of Sheriffmuir in 1715. John Monro had considerable expertise in the treatment of wounds. On one occasion, he saved the life of a man who had cut his throat so severely that he severed his trachea "no air passed by the mouth but all by the wound". Monro brought the divided parts together and the wound healed successfully.

Hugh PATTERSON who was Surgeon to the Irish Horse Regiment and Robert CAMPBELL, Surgeon to the Scots Guards, who married one of Hugh Brown's daughters, were the other army surgeons.

How Well Off Were They?

Income was divided between what one might call private practice, treating patients and the income from the shop, and what I suppose one could call public sector appointments – Surgeons were the Militia and the Town Guard. They were also appointed to the poor and to the Hospitals (so-called), such as Heriot's and Trinity which were for the maintenance of "decayed" burgesses and their dependents. Archibald FISHER was surgeon to Heriot's hospital and, when he died in 1714, James NISBET, the man who had been fined by the Physicians, applied for the post, "as being descended from a niece of George Heriot", (he did not get it) and Thomas VEATCH was surgeon to Trinity Hospital.

It was one of the perks of the Deacon pro-tem to look after the Town Guard and Henry HAMILTON, the son of Sir Robert Hamilton, a distinguished lawyer, was paid £127.15/- scots for performing several cures and furnishing medicines to the town's Company, with seven guineas for "accidental cures"!

Considering their background, let alone their occupation, you would expect the surgeons to have been quite well off. After all, it cost a parent 1,000 merks or 55 pounds sterling to have his son indentured and some surgeons who may or may not have been well off themselves married money. Thomas EDGAR married the daughter of a substantial landowning Surgeon, Alexander Pennycuick, and Hugh PATTERSON, one of the army surgeons, was given no less than 10,000 merks as a marriage settlement. While not exactly marrying money, seven helped to secure their futures by marrying a daughter of a surgeon.

Most were comfortably well off as we know from the Hearth Tax and Poll Tax records. Hugh Patterson, for instance, lived in a big house with no fewer than six hearths while Pitcairne had only five and Thomas Edgar four. For the purposes of the Poll Tax which was levied in the 1690s, surgeons and apothecaries were rated in the same category as doctors of medicine, advocates and sheriffs and had to pay twelve pounds as opposed to six shillings for an ordinary head of household, three pounds for a 'gentleman' or at the other end of the scale, 24 for a knight or baronet and 100 for a duke.

Businesses were valued in bands. From 500 to 5,000 merks, the owner paid £2-10/-, 5,000 to 10,000 £4, 10,000 to 20,000 £10 and so on. By choosing to be assessed on their business rather than their occupation, some surgeons paid less than the £12 they would otherwise have paid. James AUCHINLECK, for instance, paid £4 and lived modestly in the Tron Parish with his wife, two children, two apprentices and two servants.

The average value of an apothecary's shop seems to have been between 5 and 10,000 merks which is about 500 sterling. The three wealthiest in terms of valuation were those of John Baillie at 40,000, Thomas Edgar at 30,000 and Clerk at between 20 and 30,000 merks. As the income of the surgeon was derived in part from their shops, some must have done quite well from their business if one is to judge from the value of the stock.

Of course, it cost money to get started. John Monro borrowed 1,000 merks from his sister to allow him to start his shop in the High Street. Others were lucky enough to inherit a booth and yet others rented premises. George Borthwick paid 270 merks a year.

The army surgeons, especially John Baillie, seem to have been among the wealthier ones. The pay of a Surgeon major was the same as that of a major which was £84 sterling per annum which sounds quite generous, especially when one considers that this was in

addition to their ordinary civil income, but the problem was that it was not necessarily paid. John Monro's father complained bitterly that he had been at vast expense to support his two sons in the service who had had no pay for a year "bot for two moneths out of which they have payed for their Comissions" and he was afraid they would be "shaken loose" without pay. The reason for the Poll Tax being introduced was in part, as the Act of the Scots Parliament stated: to make up the "arrears due to the forces".

But while most were comfortable and several were very well off, that was not the case with everyone. In particular, there was Thomas DUNLOP who, in 1700, got an arrestment order against a Fife man for non-payment of a bill for 3,000 merks but, seven years later, his house was sold to pay his creditors. This was a come down for a man who had been able to study at Leyden as a student.

Even John Monro did not make a fortune, for his son recorded that soon after he retired from business, his "affairs became unexpectedly embarassed" but worst of all was George BORTHWICK. In 1714, all his worldy goods were poynded and sold at a roup when he was declared bankrupt. To escape his creditors, he fled to Holyrood Abbey which still provided sanctuary and the next we hear of him was that he had died 'abroad' less than two years later.

There are two other portraits by Medina, and they were both Honorary Members. The first is of Sir William Hamilton, Lord Whytelaw, who was Under Secretary of State for Scotland and later Lord Justice Clerk. The Minute of his admission is typical: "taking into consideration the many great and special favours conferred upon and great offices done unto them by the much honoured Sir William hamilton of Whytelaw who upon all occasions has most eminently appeared as a Patron for the Calling, do find themselves not only obliged to a thankful acknowledgement thereof but also gives them great hope of the continuance of his favours to them". He was apparently a very unpleasant man, described as being extremely partial where his friends or his politics interfered and proud, vain, ill-natured and severe so that he was odious to everybody.

In the early years of the 18th century, there was still the Jacobite threat but the attention of the Edinburgh citizens was taken up largely by the debate, often violent, about the Act of Union. At the time, three of the most powerful in the land were the Duke of Queensberry who was High Commissioner, the Earl of Seafield, Lord Chancellor and the Duke of Hamilton.

The first two were strongly attached to the Crown and consistently pro-union while the Duke of Hamilton was the leader of the opposition. There is no picture of Queensberry but SEAFIELD was painted by Sir Godfrey Kneller, the great English portrait painter. Seafield was described as a man who "understands perfectly how to manage the Scottish parliament" or, less flattering, "a soft-tongued, beautiful young man whose great strength was that he knew exactly what would please the King without ever having to think about it".

The other Medina portrait, however, is of the Duke of HAMILTON, the leading nobleman in Scotland who was an out and out Stewart supporter and had been imprisoned in the Tower for his beliefs. Two of his forebears died at Cromwell's hands and he was the leading opponent of Union. As such, he was very popular in Edinburgh and was cheered

by the crowds whenever he appeared in public. He was killed in 1712. He was too fond of duelling. In a duel described by Thakeray in his book Henry Esmond, he and his opponent killed each other.

I have shown most of the Medina paintings but the series is not quite complete. When Medina had finished, there were still six of the Surgeons who had chosen not to have their portraits done. Why, we do not know but it cannot have been because they could not afford it as they include such notables as Alexander Monteath, teacher of chemistry and a very influential figure in the decision to construct the 1697 building, Robert Eliot, the Anatomy Professor, and Dr James Nisbet, whose son is represented though he is not. The remarkable thing, however, is not that they opted out but that so many of their colleagues opted in, leaving us today with this heritage.

THE ONE HUNDRED AND THIRTY SEVENTH ORDINARY MEETING

The One Hundred and Thirtieth Ordinary Meeting of the Society took the form of a full-day public symposium at Foresterhill College of Nursing in Aberdeen. Held on 13th June 1992, it was one of the main events celebrating the 250th anniversary of Aberdeen Royal Infirmary. It was attended by 38 members and some 140 past and present Infirmary staff and members of the public.

They were welcomed by the President of the SSHM, Mr. Blair, who then handed over to Professor Ogston, chairman of the morning session. The five papers in this part of the programme were given by Mr. Alexander Adam, Mr. Thomas Schlich, Mr. Ronald Cumming, Dr. John McConachie and Professor Hugh Dudley and provided accounts of the Infirmary from its formation to events in recent years.

The meeting then broke for lunch and those who dined at the hospital were able to see the long corridor where, as a boy, Dr. McConachie had taken part in roller skating races.

Mr. Bryan Broomfield chaired the afternoon session which consisted of short papers on miscellaneous aspects of the Infirmary history. Dr. G. H. Swapp spoke about medical personalities, Mr. Kenneth Webster on a turning point in the development of nurse training, Professor Lewis Gillanders on radiology and radiography in the Infirmary, Dr Carolyn Pennington on the University Medical School and the University 1860-1914 and Mr. Arthur Williams on Pharmacy. The final speaker, Mr. James Barbour, looked to the future and the role that the Infirmary would play as one of the first Scottish NHS Trusts.

An illustrated booklet containing abstracts of the day's papers was given to all those attending. Copies of this booklet may still be available, at a modest cost, and those interested should contact Miss Fiona Watson, Grampian Health Board Archivist, Aberdeen.

The meeting finished with some closing remarks from Mr. James Kyle, Chairman of Grampian Health Board, and these brought the 1991-92 session of the Society to a close.

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.

Graham Printing Co., 47 Thistle Street, Edinburgh