

John Snow and his surgical friends

Sir Ian Fraser

It is perhaps interesting to wonder why this is the first time the John Snow Memorial Lecture has been given by a surgeon since no one, with perhaps the exception of the anaesthetists themselves, owes so much to the scientific work of John Snow as does the surgeon of today.

This lecture was founded in 1958 on the centenary of his death. It is always hard to understand the psychological reasons why a man who was a pioneer, as indeed he was, was ignored for one hundred years and even slighted by his friends and the press in his lifetime. It would appear that jealousy was a more evident feature of those days than it is today. Sir Charles Bell, the founder of the Middlesex Hospital, had his work ignored and Marshall Hall's observations on shock and the excitomotor system were only accepted and recognised many years later. Edward Jenner met great opposition and John Hunter only came into his own many years after his death: yet today there is an annual oration in memory of each of these two men. Semmelweiss, who suggested the cause of puerperal sepsis, died of a broken heart and as a result the clock was put back for many years as far as that disease was concerned. Harvey, who made the most fundamental discovery of all, was ridiculed and persecuted by his colleagues during his lifetime. Yet today a society is named after him. The public also was slow to accept anything new. George Stephenson had his railway tracks pulled up and the doctor responsible for that necessary social device called the WC was almost hounded out of town. So perhaps we should not laugh at the workers in Lancashire who broke up the cotton looms at the time of the Industrial Revolution, as they were doing nothing worse than their better educated brethren. In those days a great discoverer seldom received his reward during his lifetime. It was left to posterity to do justice to his labours and his fame. John Snow's obituary notice in the *Lancet* was so short and cryptic as to be offensive.

Perhaps it is a good sign of modern medicine and of our better manners that those who in our lifetime have made outstanding discoveries have been acclaimed at once. In the last few decades we have been privileged to live through and benefit from stirring discoveries: Banting and Best with insulin; Minot with liver treatment for pernicious anaemia; Fleming and Florey with penicillin; and your own, or perhaps our own, Ivan

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Magill—the first man to join the windpipe to the gasbag. If he was not the first to put it on the map he was certainly the first to put it on the market. We could mention scores of other names, when we think of the sulphonamides, cortisone, yellow fever and polio vaccines. It is consoling, when we hear our profession so often adversely criticised, that we can point to this better internal relationship.

Anyone in doubt about this I would advise to read the *Lancet* for the first fifty years of the last century, when most of the correspondence seemed to deal with the many unpleasant fights of that time. Possibly the editor, Dr Thomas Wakley, was not entirely blameless. A controversial and provocative figure, he was a man of extraordinary ability and courage. When only 28 he produced the first edition of the *Lancet* on Sunday 5 October 1823. Although Wakley was dreaded, feared and disliked by consulting practitioners as a whole, he carried on for years 'at the point of a bayonet'. He later went into Parliament and was able to denounce the College of Surgeons for 'its selfishness, its imbecility and its meanness'. Sir Astley Cooper called it the 'Reptile Press'—possibly because it showed up nepotism as one of the greatest evils of the day. This meant that one could only get a consultant appointment if apprenticed to a relative—Bransby Cooper was Sir Astley's nephew—and from this it was said that only 'neveys or noodles' were appointed.

In the field of surgery John Hunter has always been recognised as the man who made a science out of an art by finding a reason for all that he did. He was the son of a farmer, the last of eleven children; the Benjamin or spoilt boy of the family. Six of these died of tuberculosis and Hunter himself had phthisis from which he recovered. It has been said that tuberculosis and brilliance are often linked. This was certainly so among some of our best poets and John Snow was threatened with the same disease. In later years Hunter had syphilis, but by then he had reached his eminence so the spirochaete cannot be given any credit, although with others this has been claimed to be the cause of their success.

As a boy Hunter was dull. What he had, and so too had John Snow, was the country upbringing wherein they were partly self-taught. They learnt from the fauna and flora of the countryside and early on Snow took an interest in geology, architecture and sanitation as well. Town-bred people do not realise their disadvantages and the bad start they have in life. City life breeds a false superiority complex, blinding them to what they have really missed. Modern education, certainly academic education, tends to force children into a mould, destructive of originality and individuality. The teenage revolt is merely an effort to be out of step. Children, like hens, do better on the 'Free Range' than on the 'Battery' system and their products, eggs or brains, are probably better. Is modern education really going to hold back the John Hunters and the John Snows of the future? Freedom at an early age is more valuable than

freedom later on. The interesting people today and the most successful have in many cases a similar origin, but the welfare state encourages both young and old to sit back.

John Snow was a Yorkshireman born 25 years after Hunter's death. His father was also a farmer but by contrast he was the eldest son of seven children. His early years were marked by his intense love of hard work and his personal industry. Although a lover of the countryside he was an expert in mathematics as well. John Hunter on the other hand was the sluggard and beyond his love of the countryside around his native Glasgow, he refused any serious form of education. Both Johns might be said to be quiet country boys—yet in each there was hidden ambition to reach the metropolis; and both went to London on foot—an undertaking less formidable for the country boy than for his town-bred colleague. Glasgow to London was no mean achievement, but John Snow made his journey from Yorkshire even longer and more interesting by taking in Liverpool, North Wales, South Wales and Bath before reaching London itself. This was in the summer of 1836 and by October of that year, at the age of 23, he sat on the benches of the Hunterian School of Medicine in Windmill Street, a further link with the Hunter tradition.

With hard work and with his previous apprenticeship to various doctors which had given him great clinical experience in the North of England, Snow was able, after a late start, to obtain his MRCS in 1838. His industry continued and although he put up his plate at 54 Frith Street, Soho Square, not far away from his old lodgings when he first came to London, he made slow progress in general practice. In a way this was fortunate as it gave him the opportunity and the time to interest himself in the main medical societies. The most important was the Westminster Medical Society, later to become the Medical Society of London. It greatly helped junior members of the profession and Snow became an active member of the society whose stimulus kept him in London. As a young man of 25 he was timid, afraid to speak and with his poor delivery was not listened to at first. No one replied to him. He was often referred to as the 'last speaker', only later by name and his election as President after a few years speaks well for his strong character. He was not a man to make friends easily. Most of his life he was a teetotaler, sometimes taking a little wine for his stomach's sake when he became more affluent and when he was the recognised top-grade anaesthetist in London. Yet he remained an advocate of temperance all his life and he thought that total abstinence would become universal—a prediction so far unfulfilled! For some eight years he was a rabid vegetarian, but nevertheless he could swim better than most of his carnivorous and omnivorous colleagues.

His researches could have taken him in many directions, but during the waiting period we find he was deeply interested in respiration, emphysema, asphyxia, *etc.* In 1841 he wrote a valuable paper on 'Asphyxia and

resuscitation in the New-Born Child', an excellent communication with sound reasoning and describing his own apparatus to help in such problems. He carried out animal experiments with chloroform. After twenty experiments he was able to assess roughly the dosage for the human body and he then proceeded to try it on himself. Other compounds that he used while seeking something safer than chloroform were carbonic acid, carbonic oxide, cyanogen, Dutch liquid, ammonia, nitrogen, amylovine ether, puff ball smoke, cyanide of ethyl chloride, carbohydrogen from Rangoon, tar, amylene and various others.

In 1844 he obtained his MD. With such constant work it was not unexpected to find that he had a break-down and, as in Hunter's case, phthisis was suspected. Later in the same year he had some kidney lesion and was seen among others by Dr Bright. It would not be unfair to assume that this was the origin of the disease from which he developed the hypertension which carried him off in his prime in 1858 when only 45.

So we see this young man, steeped in the problems of respiration and the interchange of gases, as it were standing in the wings awaiting his cue. This came in December 1846 when he saw the first anaesthetic given. Liston, that flamboyant London surgeon, was completely converted to this new 'Yankee Dodge'. The arrival of ether at that moment was fortunate for Britain as it fell into the hands of a man prepared mentally and scientifically as Snow was to use it carefully and honourably. This dangerous drug was soon taken from the chemists and technicians and used on a medical basis. Thus Snow did for British anaesthesia what John Hunter had done for British surgery.

John Hunter at the peak of his career had settled in the country at Earls Court in a house with two acres of land near the village of Brompton. He built sheds in the garden and at one time he had the busiest centre of biological research in all Europe. It was said that he dissected 500 different species of animals and many thousands of human beings before his final financial crash came. At one time he had a staff of 40-50 people to look after his menagerie. To the present day researcher the field has become much narrower and the facilities much greater with financial assistance available from so many sources.

To be a John Hunter is given to few; anatomist, surgeon, teacher, research worker, zoo keeper, sailor, soldier, and accidentally self-inflicted sufferer from syphilis! Few men in a life of 65 years have done so much and when he died it was said 'he died in harness, a great surgeon has gone to his rest'. He himself would have said, like Cecil Rhodes, 'so much to do, so little time to do it'. His work makes modern research seem trivial when microchemistry and the computer do the thinking. Hunter got involved with his syphilis episode in 1768, but judging himself to be cured in 1770 he married in 1771. There were four children but no grandchildren to carry on the tradition. It is possible that his attack of syphilis may have affected his

blood vessels and produced the angina from which he suffered for years. He himself knew that with hypertension his 'life was in the hands of any fool who cared to cross him'.

John Snow's researches may not have been so spectacular, but they also involved many animal experiments. He gave a demonstration of the effects of ether on birds, animals and fishes at the Royal College of Physicians on one occasion. The final assay of any drug was carried out on himself before being used on the public. He was the quiet, industrious and shy type, a deep thinker and a man with strong views on many things. One would have thought he was a Quaker from his drab clothes and sombre look. He had a deep but unobtrusive religious faith, a great contrast to Hunter who was an ardent pagan with no faith in Genesis or anything else in the bible. Snow with his rigid way of life, his bachelor habits and husky voice could not be called a social success. Yet these outward disadvantages did not prevent him from becoming the recognised authority in his speciality and he was chosen to have the honour of giving the first anaesthetic to Queen Victoria – an incident which had far-reaching political and religious significance.

If John Hunter spread his interests over other subjects, so too did John Snow, but he was satisfied with one other consuming interest – epidemic cholera – to which he brought as much scientific knowledge as he did to anaesthesia. Both the Association of Anaesthetists and the Public Health Society claim John Snow as their patron. To have reached the top in both fields is given to very few. It is interesting to note that it was just in the year or two before he died, when his anaesthetic practice was at its peak, that he broke off to investigate the cholera problem. From his diary we see that he was paying a few visits to his small, private, general practice at the same time not to mention doing his own midwifery.

Within a few days of seeing the first anaesthetic administered at University College for Robert Liston, at which Clover and Lister were also said to be present, Snow himself was to give ether in the outpatients' department of St George's Hospital. In a few weeks he was working 'upstairs' for Mr Cutler and it was here that he was seen by Liston, who was so impressed with his care that he soon became his personal anaesthetist in hospital as well as for his private patients. This was a very valuable connection. Liston had been at the top of his career in Edinburgh when he was elected Professor of Surgery at UCH, then called the North London Hospital. He was a brilliant surgeon – fast, dextrous and ruthless, as he had to be when working without anaesthesia. Alcohol, tourniquet compression, deep pressure, mesmerism, speed and shock, or bleeding to the point of syncope were all that were available. Not much wonder when he saw ether given for the first time at UCH that he should say 'This beats even mesmerism'. He had the usual difficult entrance of all Scots into London. He was openly critical of his colleagues and had a deadly hatred

of his opposite number the professor of medicine, who had foolishly started treating his patients with 'animal magnetism'.

University College Hospital was trying to break with the old method of patronage which kept many men out in the cold, money rather than brains getting the staff appointment. UCH, by taking this stand, was soon called 'that low place in Gower Street' 'an infidel' 'a stinko malee' But it could afford to laugh as it had the largest class of students in the metropolis with excellent teachers. Liston's lectures were superb—often reported in the *Lancet*. His personal weakness was his love of approbation and display. On a field day he would have crowds of students from other hospitals, which made colleagues in other hospitals take every opportunity of disliking and deprecating him. He certainly laid himself open to censure, living a flamboyant life, keeping a good table and taking violent exercise. Each day he did a fast walk to Hampstead or Highgate and back before breakfast. All his spare time was spent 'boating, yachting or horse exercise'. He died young on 7 December 1847, not unexpectedly from a ruptured aortic aneurism, just one year after he had seen his first ether anaesthetic.

To Snow his premature death was a severe blow. However, he soon became attached to Sir William Fergusson of King's College Hospital, one of London's busiest and most influential surgeons and the one with the most aristocratic practice. It must be said that with Sir Astley Cooper, Abernethy and Sir Benjamin Brodie, London had at that time a collection of very important surgeons. Brodie's income was reputed to be £15,000, Sir Astley Cooper's best was £24,000, Abernethy's £10,000 and Liston's never more than £7,000. These figures are given by J. F. Clark in his book *Autobiographical Recollections of the Medical Profession* and as it is dedicated to Sir William Fergusson, his is the only income not mentioned.

During the last century surgery had three milestones; one in the 40's, one in the 60's and one in the 80's. Anaesthesia, antisepsis and asepsis, the last of which lead to the appearance of modern abdominal surgery as we know it today. From that date gastric and other forms of cold abdominal surgery could be undertaken. Until then surgery was life-saving only. Before the Listerian period pus was accepted as a pre-requisite, and if it could drain externally the patient recovered. Teeth extractions, amputations, external drainages, all producing laudable pus to drain into bucket or sawdust, justified a good prognosis. Without this death was inevitable. Bone and joint surgery were almost invariably fatal and so it was on this class of case that Joseph Lister tried out his carbolic dressing.

Anaesthesia, after a wonderful start in 1846–7, first with ether and then with chloroform, ran a very static course until well into this century. As far as I could see as a student and house surgeon, anaesthetics differed little from those of John Snow—the drop bottle and an open mask with the layers of gauze carefully counted. In some wards it was the resident student who gave the anaesthetic whilst the house surgeon assisted and

vice versa in other cases. Along the lines of communication from the student via the house surgeon to the chief, regular information was given regarding the size of the pupil and its ability to contract and if they were not fully satisfied the eye was widely opened and inspected by all three. This does not seem so long ago, but few surgeons would accept this now and certainly no patients. Nor indeed were our medical insurance societies troubled over trivial matters of face burns, loss of teeth *etc.* They were treated more or less as 'a rub of the green'. The night before an operation, if there was any question of the patient's fitness to stand a general anaesthetic, an opinion was sought from a general physician. For some reason it was usually the senior physician who was asked – the one least likely to know – but it might be a slight loss of 'face' if the senior surgeon asked for a junior physician's opinion. Usually the man in question had never given an anaesthetic, knew nothing about it and often had the audacity to say 'Yes, provided you use gas or oxygen' – something impossible in the pre-relaxant days.

The outstanding feature of the modern anaesthetist is his ability to make a clinical assessment of the problem. I look on this as a public opportunity for a surgeon of many years' standing to say 'thank you' for what the anaesthetists have provided and do provide. The pre-operative selection of the drugs, the operative care, the post-operative recovery instruction, the blood transfusion, the gastric suction, the bronchial suction or lavage, adjustment of the operating table – raise, lower, tilt – put on or supervise the diathermy pad, perhaps put on the Esmarch tourniquet – and if they have time they can probably weigh the blood-stained swabs better than anyone else. It may be said that some of these tasks do not fall within their scope – technically no – but I hope that questions of demarcation and 'who does what' will never arise. We do not ask them however, as they did in John Snow's day, to do the cupping of the patient or to apply the leeches.

The anaesthetist is certainly the Gunga Din of modern surgery. Of course they have built their own ivory towers – the recovery room, the intensive care and respiratory failure unit – but they are not ashamed to listen to the chest, feel the pulse and note the blood pressure. No anaesthetist that I know carries an electrocardiograph; he still believes that a clinical examination is worth more than irregular waves on a moving screen. In fact the anaesthetist has become a true clinician.

What of the surgeon? The public think surgery has made wonderful strides and certainly surgeons are doing things they could not do thirty years ago. But how much is due to their own better skill or better knowledge? In many cases it is the ancillary aids that have helped. Anaesthesia has made the exploration of certain activities possible; extracorporeal circulation has kept the patient's vital organs alive while the surgical repair is being carried out; blood transfusion and hypothermia have

modified other forms of treatment. The radiologist by visualising the entire cardio-vascular system with its ingoing and outgoing tubes from the foot to the brain has localised the problem to the correct area. The chemists and physicists with new man-made fibres have made better and more suitable material for replacing lost tissue. The isotopes have changed the problems of thyroid surgery and the biochemists have helped in the diagnosis of the carcinoid, the insulinomas, the parathyroid tumour, Cushing's disease, the pheochromocytoma, *etc.* Histologists with washings from bowel, bladder, stomach, vagina, peritoneum, pleura and lungs, discover the malignant cells and help to pin-point the site of the lesion. One could give scores of examples of the help given by the researchers, medical and non-medical. In other words, the surgeon has the same number of fingers that he had before, the same tools, but it is the help of the others that has made the difference.

We said that progress in surgery was marked by important individual discoveries. Similarly with anaesthesia it was not a slow, gradual process. Suddenly, out of the blue a drug was discovered to reverse curare and make it safe; a safe intravenous narcotic was evolved as well as the technique of keeping the lung from collapsing, thanks to Ivan Magill. And so anaesthesia, after the long Snow period developed into the new smooth and safe technique so much appreciated by patient and surgeon alike.

Three handwritten notebooks comprise a diary recording all the anaesthetics given by Snow over ten years, in fact all of his active period. The first 47 names are missing but otherwise they are complete and the last anaesthetic was actually given only five days before his death. The depth of anaesthesia is recorded, the duration and the one complication mentioned throughout, vomiting. He had no deaths in his 4,285 chloroform anaesthetics, but one from amylene. He gives the age and sex of most of his patients. The age varies from a few days in children with hare lip, of which there are many, to old people for leg amputation. His clearly documented list gives a wonderful cross-section of the surgery done in London, probably representative of all England, from 1848-58, and yet this was ten years before the invention of Lister's antiseptic technique, the centenary of which, incidentally, we celebrated last year.

Cancer of the breast appears frequently; presumably the wound was left open with external discharge and allowed to granulate. On one morning we see he gave anaesthetics for three children for repair of hare lip by Sir William Fergusson. Perineal incision is mentioned often and probably this is for an abscess secondary to gonorrhoeal stricture. Other signs of venereal disease are constantly mentioned. Removal of sequestra in instances of bone necrosis occur almost daily. We see Dr Snow's own name mentioned a few times as surgeon as well as anaesthetist and, on looking into the details, we see it was for a 'parturition' so he was doing quite a bit of midwifery himself at the same time. Opposite his name we

see he gave anaesthetics for status epilepticus, migraine, tetanus and the reason in another case was for amusement. I wonder whose, the patient's or the surgeon's?

Cases of cancer of nose, face and lip were common and there was much mouth surgery for osteomyelitis, cysts and malignancy. Sir William Fergusson had a great reputation for surgery of the jaw and it is said that he actually operated on his own wife for the removal of her upper jaw. We see circumcision mentioned frequently and also removal of tonsils.

Bladder stone occurs often. An anaesthetic was given to 'sound' for the stone. In other cases the crushing operation of lithotrity was carried out but almost once a week we see, what no one has seen for 100 years, lithotomy or 'cutting for stone'. This is an operation which would strike terror into the heart of any modern surgeon. In addition, bladder stone, so common in Pepys' time, is now much rarer. In Snow's diary we find that bladder stones were quite common in young children.

Snow's extensive list of operations done by over thirty different surgeons, illustrates the scope of pre-Listerian surgery in which the only feature common to all cases was free external drainage. We may now laugh at 'laudable pus' but in those days it was a sign of life and probably success. In all this series abdominal surgery is barely mentioned; once to tap an ovarian cyst and in another case to remove it. The value of this record is that it gives the result of many surgeons' work, chloroform anaesthesia being the common denominator rather than the work of one surgeon limited by his own interests, his surgical field and his own integrity. I would recommend that everyone should read this diary and congratulate the College that it has been kept in such perfect condition. On one page interspaced with the other anaesthetics of the day is a note to say that he had gone to the palace to give an anaesthetic to Queen Victoria. This important anaesthetic gets little more space in his diary than the preceding one which was for dilating a stricture in somebody's butler. Five days after the last anaesthetic detailed in his diary he was just penning the final words of his book on chloroform anaesthesia when he took an apoplectic seizure from which he died some eight days later.

Two pages from John Snow's diary

Administered chloroform in King's College Hospital to a man whilst Mr Fergusson applied needles and ligatures to some varicose veins of the leg. Also to a young woman whilst he performed excision of the knee joint. This patient was through the operation very well but died the next week but one afterwards.

Monday 4 April 1853. Administered chloroform to Mrs Gatenby, 7 Seymour Place, Wandsworth Road whilst Mr Fergusson operated for haemorrhoids. The patient, a stout red faced person, about 45-50, resisted

the chloroform a good deal after she became half-conscious. She vomited after the operation and became very livid in the face for a minute or so in consequence of holding her breath whilst vomiting.

Tuesday 5 April 1853. Administered chloroform at Mr Judd's to a gentleman – Lord Charles' butler, aged 35, with a bad stricture while Mr Judd endeavoured to get a catheter into the bladder. The chloroform was continued for an hour. No sick up.

Wednesday 6 April 1853. Administered chloroform to the Queen in her confinement. Slight pains had been experienced since Sunday. Dr Locock was sent for about 9 o'clock this morning, stronger pains having commenced and he found the os uteri had commenced to dilate a very little. I received a note from Sir Jas. Clarke a little after 10 asking me to go to the Palace. I remained in an apartment near the Queen along with Sir J. Clark, Dr Fergusson and (for the most of the time) Dr Locock till a little after 12.

At twenty minutes past twelve by a clock in the Queen's apartment I commenced to give a little chloroform with each pain by pouring about 15mms by measure in a folded handkerchief. The first stage of labour was nearly over when the chloroform was commenced. Her Majesty expressed great relief from the application – the pains being very trifling during the uterine contractions, and whilst between the periods of contractions there was complete ease. The effect of the chloroform was not at any time carried to the extent of quite removing consciousness. Dr Locock thought the chloroform prolonged the interval between the pains and retarded the labour somewhat. The infant was born at 13 minutes past one by the clock in the room (which was three minutes before the right time) consequently the chloroform was inhaled for 53 minutes. The placenta was expelled in a very few minutes and the Queen appeared very cheerful and well, expressing herself most grateful with the effect of the chloroform.

Thursday 8 April 1853. Administered chloroform to gentleman between 60 and 70 at 9 Montpellier Street whilst Mr Lane applied strong nitric acid to the surface of an extensive cancerous ulcer on the left side of the nose laying open the nostril. Patient many years before had been refused life assurance on account of heart disease. No sickness after the chloroform.

The list of surgeons mentioned in this series shows that he was employed by all the leading men of the period: Paget, Liston, Brodie, Fergusson, Cooper – all with very large practices and men of great influence. To be a successful surgeon in the pre-Listerian period a man had to be fast, dextrous, forceful and courageous. Competition, litigation and quarrels were frequent. Snow was lucky in not hitching his wagon to any one of

these stars and so, although we know he gave anaesthetics at St George's Hospital and UCH, he must have been called to ten or more other London hospitals. It was the most colourful period of British surgery. Into this arena the timid John Snow was thrown and it says much for him that he was soon sought by these giants who in fact became completely dependent upon him. No anaesthetist since has had such a vast number of surgeons to work with and no anaesthetist has ever had the *entré* to so many hospitals. It is worth looking at a few of these men.

Robert Liston was his first surgeon, but he was attached to him for less than one year and during that time the anaesthetic agent had been ether only. Snow had just finished his book on ether anaesthesia when from Scotland, at the instigation of J. Y. Simpson, came the suggestion of the use of chloroform. Snow's book on ether never came to anything, as chloroform became the anaesthetic of his choice for the rest of his life and the subject of another book which he spent ten years in compiling. One must not leave Simpson without a few details about this very remarkable man. Basically he was a gynaecologist and like many of the best people he came of Scottish yeoman farmer stock of distant Huguenot descent. Although he said he 'felt very young and very solitary' at Edinburgh University, yet at the early age of twenty eight he was made professor of midwifery. Although he tried out ether early he felt that something better could be found and so in November, 1847, he and his assistants experimented with chloroform on themselves. As they all ended up unconscious under the table, Simpson seemed reasonably satisfied that a new and better drug had been found. To get away in Edinburgh with such a radical advance was no easy matter and the idea was denounced as being dangerous to morals, health and religion. Although an outstanding gynaecologist with original inventions to his name such as the uterine sound and the sponge tent, he also, like Snow and Hunter, had diversified his interests. It was said he was admirable in controversy - 'when in the right he was irresistible and when in the wrong a formidable opponent'. Like many great men he had his weaknesses and in his case it was his unwillingness to accept the new Listerian principles, although without them he could not have carried out his early ovariectomies. He was also a great archaeologist and published three large volumes on antiquarian subjects, including in his many interests an intimate knowledge of the Egyptian Pyramids. He wrote a book *The Tombstone of the Grandfather of Henga and Horsa* and another *Cup Markings in Scotland, England and other Countries*.

Yet at the same time hotels and lodging houses in Edinburgh were filled to overflowing with his patients from all over the world. They alone were worth £85,000 per year to the hotel-keepers in that town, enough to make even some modern gynaecologists water at the mouth. Like Liston he died worn out by his labours, or possibly his patients' labours, at the age of 59, of angina pectoris and an aneurysm of the heart. He was quite im-

perturbable, amiable, kindly in manner and of magnetic attraction. It was as a student, on seeing a breast removed without an anaesthetic, that he ran out in horror and went straight to Parliament House, Edinburgh to seek the post of writer's clerk. Thus we see where the constant desire to find a suitable anaesthetic arose. He was the first medical man in Scotland to be made a baronet.

On Liston's death, William Fergusson became Snow's chief supporter. He was not the same showman as Liston, who used to say 'Now, Gentlemen, come, time me'. Fergusson had been surgeon to the Royal Infirmary in Edinburgh and was sharing with James Syme the best surgical practice in Scotland when in 1840 he accepted the professorship of surgery at King's College, London, with beds at King's College Hospital, then situated in the slums of Clare Market. His fame brought crowds of students to see him operate. He wrote one paper on 300 successful operations for hare-lip performed by himself. It was he who coined the word 'conservative' surgery. This referred to operating on a diseased joint rather than removing the limb completely. As a technical operator he had no equal. It used to be said 'go to Paget to find out what is wrong with you and then go to Fergusson to have it out'. He was skilful in designing new instruments to suit his operations: *e.g.* his angled cleft palate knives were in use till modern times. Other obvious instruments like bull-dog forceps and the mouth gag are still reminders of a very great man. So silent was the work done in his theatre that people thought he was on bad terms with his assistants. He worked at great speed and at a lithotomy it was said if one winked at the wrong moment one might miss seeing the stone being removed. He was very sociable and given to generous hospitality and entertainment – his favourite London hostelry was the Albion Tavern. On one occasion he invited the editor of *Punch*, one Mark Lemon, to such an evening dinner. The editor, knowing what to expect, replied 'Look out for me at seven, look after me at eleven – Yours, Mark Lemon'.

Another name which appears frequently in Snow's diary is that of Sir William Bowman. He came from Birmingham to join the staff of King's College and later Moorfields. Starting as an anatomist, physiologist and curator of the museum, he later became the leading ophthalmic surgeon in England. One of the first to use the new ophthalmoscope, he became interested in glaucoma, cataract and detached retina. In his memory there is an annual Bowman lecture. In his early years he was a skilled histologist, producing papers on striated muscle, alimentary canal mucosa and the structure of the kidney; and Bowman's capsule is a reminder of his work in that field. He was indeed a man of many facets but his modesty, his patience and his thoughtfulness were a pleasant contrast to the noisy exhibitionism of his colleagues.

Another man of great importance and said by some to be leading surgeon in England was Sir Benjamin Brodie. He had succeeded to the

position once occupied by Sir Astley Cooper. He was not a great operating surgeon but his powers of diagnosis were remarkable. He was a distinguished teacher with an elegant delivery. One of his great advances was the popularising of the operation of lithotrity in place of lithotomy. He died completely blind, having had an unsuccessful cataract operation performed by his friend Sir William Bowman. The actual cause of his death was in fact a malignant disease in the region of the shoulder joint. He is remembered as the surgeon who, with Sir Astley Cooper and an entourage of eminent men, successfully removed a sebaceous cyst from the scalp of King George IV. A baronetcy seems a generous reward for such an operation.

Of all the men who supported Snow none is better known than Sir James Paget. From Yarmouth he came to St Bartholomew's Hospital. For many years he supported himself by writing and teaching on medical subjects, but he also published a splendid book *History of Yarmouth* dealing with the animals, birds, reptiles, fishes, insects and plants of the area. After a very stiff contest he was elected to the staff of St Bartholomew's Hospital and it was here that he founded one of the best medical schools in London.

Robert Keate was another of the interesting men who put their faith in Snow. He came up from Worthing to succeed Caesar Hawkins on the staff of St George's Hospital. This hospital at that time had – and still has – a wonderful staff, probably stemming from the stimulus of John Hunter. The son of a parson, he had a very notorious brother, John Keate, described by one writer as 'the well-known and ferocious headmaster of Eton – by whom the boys of the school had English history emblazoned on their bottoms'. It must have been pleasant to live at a time when one could say what one wanted to about people in general! Robert Keate was early appointed surgeon to the Royal Family but said on one occasion – 'I have attended four sovereigns and have been badly paid for my services, one of them now deceased owed me 9,000 guineas'. On one occasion he had an urgent summons to Windsor to see Queen Adelaide. The Queen was suffering from a pain in her knee and gave Keate a hint that the presence of the King might be dispensed with. Keate accordingly asked the King to leave the room. 'Keate,' replied the King 'I'm damned if I go.' Keate looked at the King and quietly said 'Then, Your Majesty, I am damned if I stay.' The King did go and they remained very good friends. A good surgeon and a careful diagnostician, Keate has left little in the way of professional literature. Unfortunately he did not know when to retire and finally he was forced to go by the enquiry of certain of the Governors of the hospital who made a daily check on when he came in and what operations he did.

It is tempting to go on as almost all Snow's surgical colleagues were 'characters'. I wonder – have we no longer the same type of man doing

surgery? Are the anaesthetists to blame for this? Have they made surgery too easy so that anyone, no matter how slow, can do it? I would hope that this is not the case. Snow was associated with 30-40 surgeons, many of them in the top rank of their profession. Most of them seemed to belong to that exclusive group spoken of as the '300 Original Members of the New College of Surgeons', really 'Foundation Fellows', this was highest surgical distinction at that time; their biographies are for the most part recorded in detail in Platt's *Lives of the Fellows*. They varied in their interests, some were good technicians, some good teachers, some good writers, all were in the front line of surgery in those critical formative ten years when anaesthesia was on trial. It is difficult not to mention some others - Caesar Hawkins, Bransby Cooper and his uncle Sir Astley Cooper, Hewitt, Partridge, Hawthorne, Johnson, Fletcher, Cutler, Cock, Coulson, Ure, Wade, Lane, Quain, French, Erichsen, Aston Key, Rogers, etc. The list is endless, but shows what universal support Snow received and gave to his surgical colleagues and how extensive was his practice.

Could the modern anaesthetist do this today? The high status of the anaesthetist in Britain is due to the fact that he holds that valuable link which binds together so many of the branches of our profession. This status stems from a quiet man who 120 years ago realised that an anaesthetic must be given on physiological lines and not by an itinerant chemist by rule of thumb. Snow had only a decade in which to make his reputation. Yet, without the usual professional, university or political honours which would assuredly have been his had he lived, this shy, retiring man made such a name that today we have this important body, The Association of Anaesthetists, devoting one afternoon each year to commemorate his life and work.

It has been said that if you know nothing about a subject the best thing to do is to write a paper about it. I, perhaps, did not know a great deal about John Snow before I started, but I have lived daily with him for some months, even slept with him, so that I am now almost on Christian name terms with him and I hope that John is on the same relationship with me. The more I got to know this man the more I have appreciated his value and the more I have realised why the Association of Anaesthetists have arranged for his memory to be kept alive. I said at the beginning it was an honour to be asked to be the John Snow orator; I would now say that it has been a privilege and a pleasure to be associated with the intimate life of this great man, and I would thank the President and the Council for entrusting me with this very pleasant task.