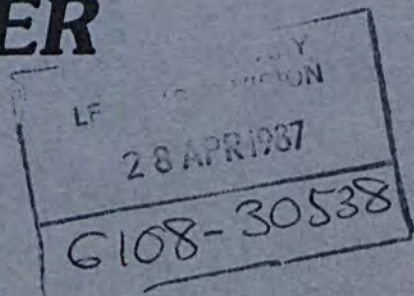


NEWS LETTER



THE SCOTTISH SOCIETY
OF ANAESTHETISTS

Founded
20th February, 1914

December 1986
No. 27

SCOTTISH SOCIETY OF ANAESTHETISTS

COUNCIL FOR 1986-87

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		Retires
Aberdeen	Dr C. R. DUNDAS	1987
Dundee	Dr I. S. GRANT	1989
Edinburgh	Dr N. H. GORDON	1987
	Dr D. G. LITTLEWOOD	1988
Glasgow	Dr A. D. McLAREN	1988
	Dr T. L. FRASER	1989
Inverness and North	Dr J. D. MUIR	1989

PROGRAMME FOR 1987

Registrar's Prize: Entries to be submitted to the Secretary by 28th February, 1987

Annual General Meeting: Peebles Hotel Hydro, 24th-26th April, 1987

Registrar's Meeting: Western General Hospital, Edinburgh, May 29th, 1987

Scientific Meeting and Gillies Lecture: Aberdeen Royal Infirmary, November 20th, 1987

Golf Outing: Scotsraig Golf Club, Thursday, June 11th, 1987

President's Newsletter

Heigh Ho—An expression of slight uneasiness (Walker's Rhyming Dictionary)



It is Monday, three days after a most successful Scientific Meeting at the Kelvin Conference Centre in Glasgow, and I am sitting in my office at Law Hospital writing this report for my year of office which, apart from one more Council Meeting and the A.G.M. at Peebles in April 1987, is nearly over.

I have three things to talk about, firstly my office at Law, secondly events of the Scottish Society that have occurred since April 1986, and thirdly "Hospital Medical Staffing—Achieving a Balance"—The Hayhoe Report.

Back to my office. The Council of your Society is very worried about the lack of accommodation for anaesthetists in Scotland in new hospitals but also in old hospitals as well and they have applied their minds to it. Wheels, of course, turn very slowly in the hierarchy of power and it might be some time before we see any results.

Accommodation for anaesthetists throughout Scotland is very poor on the whole, especially as anaesthetic staff comprise such a large number in relation to other specialties. Such accommodation as has been acquired by divisions is due in many cases not to the "Planners" but to the anaesthetists putting up their plate and squatting in what in many instances is inadequate space. However, I am lucky. For several years now I have had my own room and I am not even Chairman of the Division. Your Council is hopefully pursuing the matter but it will take time.

Secondly, this item concerns events which have taken place at the A.G.M. in 1986 and since. We had a most successful Registrars' Meeting at Dundee organised

by Dr I. Grant ably assisted by Dr N. MacKenzie. It was greatly enjoyed by all as it contained many interesting facets of anaesthesia—local anaesthetic techniques and laser surgery were but two of the sessions I attended. Medical staffing was reviewed by Sir James Fraser in the afternoon but as his committee's findings are confidential, he could only hint at the changes that might occur. More recently, as I indicated, we have just had a most successful Scientific Meeting at the Kelvin Conference Centre, Glasgow. This meeting was well attended and I think the subject matter of all speakers held the attention of all present. Our thanks are due to Drs A. MacLaren and J. Collins of the Western Infirmary, Glasgow, for organising an excellent meeting with an excellent choice of venue.

The Gillies Memorial Lecture given by Dr A. Masson, Edinburgh Royal Infirmary, was excellent, well delivered and it contained many interesting facets of the life of John Gillies and his contemporaries. It made me, one who has lived through part of that life, quite proud to have been a very small cog in the machinery and I am sure it gave all our junior staff a pride in the history of Scottish Anaesthesia.

In my diary of events I have left to the last the A.G.M. at Peebles in April 1986. I think it was a most enjoyable event. The scientific part of the meeting, if indeed hypnotising a snake and a hen could be called scientific, seemed to be appreciated by everyone, especially the paper by Dr Rae Webster from Dundee who won the Registrar's Prize and the stimulating address by that ever so young guest lecturer, Professor P. Bromage. I believe Professor Bromage has now applied to join the Society.

The A.G.M. chaired by Professor Sir Gordon Robson, went very smoothly with no hiccups whatsoever. It is a meeting where we see things, learn things, and it is a family affair. We do things together, like putting, playing tennis and squash and swimming. Some even play golf and some fish, although I believe the fish were very scarce this year. Dr Straton won the Angling Trophy again, without even landing a fish. Even at the ball on Saturday night it was a family affair, greatly enjoyed by all.

The meeting this year was livened up by the hint of a fire in the hotel on Friday night. Indeed we had a great impromptu symposium at the assembly point outside the main entrance at 2400 hours. Professor D. Campbell, to whom we offer our congratulations on becoming Dean of the Faculty of Medicine, Glasgow University, brightened the evening sartorially when he appeared in his shortie pyjamas. Also, I will remember little Gavin Maule with the fireman's helmet on his head. He had a ball! I certainly am looking forward to next year's events—I hope everyone will put the date in their diary.

I now come to my third item, medical staffing. Possibly this is the most important topic that has, is, and will be discussed by us for some time.

I have now toured Scotland twice. Initially I was a member of Sir James Fraser's sub-committee in which, along with others, I visited many divisions in Scotland. I think we were well received everywhere but some divisions did look on us with a degree of suspicion. However, Sir James Fraser's promise of a Registrar for every glass of sherry at lunch soon settled their fears!

Later on, I visited every division in Scotland again in order to convey "greetings" from the Scottish Society but more importantly to ask anaesthetists, junior and senior, what were their views on the published Hayhoe Report and also to ask for their views on the Shaw Report as I heard it called, which has not yet been published but the contents of which are surmised by many.

Right away, as you would expect, there is no unanimity about any of the proposals. Whether there is a good majority view, I would be reluctant to say. However, everyone is agreed that there are too many doctors in the training grades but whether they need to be so drastically cut is open to question.

Many anaesthetists told me that, just as in industry, market forces in anaesthesia seem to be working and that at the end of the day, regarding anaesthesia in Scotland, the balance may just be right. There is no doubt that if the training grades are cut then there will be a short-fall in the service requirements. Despite Hayhoe, I don't think this short-fall will be met by his working party's proposals. This view is shared by many.

If the shortfall is not adequately covered by other staff, I am afraid that the government will hope consultants will work the hours that we used to work in Lanarkshire thirty years ago in order that there will be no cutback in the elective work. Certainly the replacement of a registrar by a consultant will not be the solution. It has been said to me by many colleagues throughout Scotland that when a registrar is lost, he should be replaced by 2 to 2½ consultants and not by the 1 for 1 as indicated in the Hayhoe Report. Certainly the proposal for an intermediate grade, I think is excellent, but the numbers proposed go no way towards supplying a solution. A great number of consultants and juniors are suspicious of this intermediate grade, although others are for it.

As for expansion of consultant numbers: many consultants are not necessarily in agreement, certainly not for a "Short type" of expansion if that is possible financially. There are, however, some consultants in Scotland who would be prepared to work a "Short type" of contract but this envisages a large expansion of the consultant grade and a necessary alteration to the present contract. A large number of consultants, both

young and old, are unhappy when they contemplate that they might be expected to do first on-call and be resident. There are some consultants, however, prepared to do this but they say it will cost the N.H.S. a lot of money or time in lieu. Certainly, many anaesthetists fear that the cuts will be uneven and that consultant anaesthetists may have to work with junior surgeons at night. This seems to be a most serious problem. It has been said by many consultant anaesthetists that if "Short" is applied it must be applied evenly throughout all the specialties. There is no doubt, however, as Professor Spence has constantly said, many of the staffing problems that might arise may be partially solved by adequate rationalisation of acute and obstetric services. Unfortunately in Scotland planning, and many building programmes of the past are such that this will not be easily possible. There is no doubt that if the "planners" get their act together now, some potential future problems could be solved. I fear, however, that if the staffing structure proposed by Hayhoe is put into effect and without the service shortfall adequately solved, the hospital service will suffer, teaching hospitals will be affected but not to such an extent as the district hospitals. The achievements of the past 20 years might go by the way. Possibly I.T.U.s will not open, but worse still, those presently open will close. Many epidural services presently under strain will stop. Last but not least, it might be the lot of the D.G.H. to do emergencies only.

There is one saving grace, changes if they do come, will of necessity, be gradual and perhaps take place over a decade.

In my travels it has been pointed out to me that many of the consultants' duties are outlined in an Association of Anaesthetists' report and this should be the basis of the consultant contract. I believe, however, that the S.H.H.D. whilst they know of this report, have not discussed it and furthermore do not necessarily accept it.

Finally it remains now for me to thank our secretary and treasurer for being two very fine office bearers and servants of the society. They retire next year but I am sure that Doctors P. Wallace and A. D. MacLaren who are the council's nominees for secretary and treasurer next year, will uphold the fine traditions set by Farquhar and Iain.

My thanks are also due to the help received by council. Last but not least, my special thanks to Dr W. Macrae, editor of this newsletter.

I retire in December and I note from the duty sheet in front of me that I am on terminal leave. I hope, however, to see you and your family at Peebles in 1987.

Editorial

This has been a vintage year for our society, with three very successful meetings. Many of the presentations were of an exceptional quality, but I would like to single out one for special mention—that is the Gillies Memorial Lecture. In this superb address Dr Alastair Masson examined the evolution of anaesthesia as an independent specialty, showing how the dedication and hard work of a small but talented group of doctors changed anaesthesia from a medical backwater to a discipline able to take its place as an equal among the major specialties in medicine. Anaesthetists provided safe and relatively comfortable conditions for patients around the time of surgery and the ability to deliver this service earned the specialty the respect of colleagues, patients and the population at large.

These early pioneers lived in rapidly changing and troubled times. One of the themes that emerges from reading through past editions of the Newsletter is that each generation worries about the changes, the rate of change and the current problems. The present generation is no exception and we perceive rapid changes and problems, particularly in the organisation and funding of the Health Service. In our response to these changes we should look back to the early pioneers and continue in the work that they put on

such a solid foundation. In the present circumstances we need to ask ourselves in what way the service can be improved. Advances in safety over the past fifty years have been dramatic. In his fascinating article in the 1984 edition of the newsletter Dr I. M. Campbell-Dewar reminded us that in 1930 there were 102 "anaesthetic deaths" in Glasgow. When it comes to improving the comfort of patients after surgery, is our record so exemplary? a study of the literature and a visit to most surgical wards would suggest that there is still much room for improvement. Our society is in a unique position to make advances in this field by undertaking a nationwide study of the present state of post-operative care and how it might be improved. By doing so we would surely be following in the tradition of our founding fathers.

This is the last Newsletter that I shall edit and I wish my successor John Murray every success for his period of office. I would like to thank all those who have contributed to the Newsletter in the past four years and urge members who have stories to tell and memories to share to consider committing them to paper. I know that future editors will always be grateful for contributions!

ANNUAL GENERAL MEETING

The Society's Annual General Meeting was held at Peebles again this year. The usual relaxed and friendly atmosphere prevailed and the hotel staff looked after the Society's members in lavish style. At the dinner on Saturday night the main course was carried in by a procession led by a piper in full highland dress. To liven up the evening before the A.G.M. a visit from the local fire brigade was laid on, but thankfully this turned out to be a false alarm.

The golf competition was won by Bill Kerr with Robin Allison second and Jimmy Collins third. Isobel Kirkwood won the ladies prize. The "Grouse and Claret" fishing trophy was retained by James Straton.

The prizes were presented to the winners by Mrs Meg Bromage, the wife of our guest speaker.

The Annual General meeting took place on Saturday morning with the Presidential Address, the Guest Lecture and the Registrars' Prize Lecture in the afternoon. Our President not only entertained us with a discussion about an unusual and interesting topic but illustrated his address using a hen and a snake. Professor Bromage lived up to his reputation as one of the finest speakers on anaesthesia in the world. In every way this was a most successful meeting.



Peebles Hydro Hotel

EXPERIMENTUM MIRABILE

When Dr Heron was appointed Moderator of the Church of Scotland several years ago, he said he was slightly alarmed, generally incredulous but deeply honoured.

Last year at peebles, when I was elected Vice President of this prestigious society, I at that time, was slightly alarmed, generally incredulous but deeply honoured. Today, one year later (and it has been a short year) now that I am Moderator of the Assembly, I am more alarmed, more incredulous and if it is possible more deeply honoured. I only hope that I can live up to the standards set by previous moderators.

I feel that this society has not only honoured me but honoured my hospital, Law, where I have worked for the past 37 years and I feel that you have also honoured the division of anaesthesia at Law which had only one anaesthetist when I arrived in April 1949, but now numbers 23.

My subject this afternoon will be 'hypnosis' and I have titled my talk "Experimentum Mirabile"—the Wondrous Experiment—for a reason I will disclose later.

I have chosen hypnosis for three reasons. Firstly it is really the only subject I can talk on. Secondly none of our previous Presidents in their Presidential Address have spoken about hypnosis although Dr Raffan in 1966 spoke about sleep and sleep does tend to be equated with hypnosis. Hypnosis, however, does tend to be a Cinderella subject. Thirdly, alternative medicine (and hypnosis might be classified as an alternative therapy) did receive a fillip in 1982 by the Prince of Wales when he addressed the B.M.A.. Directly as a result of the Prince's speech, the B.M.A. set up a working party on alternative medicine under the chairmanship of our own Professor J. Payne. It is expected that his report will be published later this year—I look forward to reading it.

Prince Charles, when he spoke to the B.M.A., made a plea for medicine not to become so involved with scientific medicine that they forget the fringe therapies and he quoted some advice from Paracelsus which I think is as true today as it was in Paracelsus' day "Like each plant and metallic remedy the doctor too must have a specific virtue. He must be intimate with nature; he must have the intuition which is necessary to understand the patient, his body and disease. He must have the 'feel' and the touch which makes it possible for him to be in sympathetic communication with the patient's spirit."

Paracelsus also believed that "the good doctor's therapeutic success largely depended on his ability to inspire the patient with a confidence and to mobilise his will to health."

I never realised until now what a big business alternative therapy is in this country. It is in fact a growth industry in contemporary Britain, as was stated recently in a leading article in the B.M.J. in 1982. An endless source of books, radio and T.V. programmes urge on the public the virtues of treatment ranging from meditation to a 'hole in the head' to let in more oxygen. The latter alternative therapy is called "Trepanation or Trephining" an ancient therapy practised in many cultures and sometimes going under the title of "The Third Eye."

In 1983 the 'Observer' published an article concerning a Ms Amanda Fielding, a one-time prospective independent candidate for Chelsea, who polled 10 votes in her first election and 130 in her next. In her election manifesto she said that she would like trepanation performed under the auspices of the N.H.S. Actually she trapped herself with a dental drill in front of the bathroom mirror—losing a pint of blood in the process.

She said if she had not done this she would now have been a 'junkie' or at best an alcoholic. She had also persuaded her husband to have a 'hole in the head.' It is stated by the proponents of this cult that "it increases the blood volume of the brain and induces a heightening of self-consciousness without producing anti-social or erratic behaviour." It is supposed to give you more energy, more inspiration and also a natural high. It makes you better prepared to fight neurosis and depression and also less likely to become prone to alcoholism and drug addiction.

In 1983 a Dr D. T. Reilly, a G.P. in Glasgow, published a paper on the attitudes of young trainee G.P.s to alternative therapy and he got some strange results. He sent out 100 questionnaires and 86 were returned properly completed. He listed 14 alternative therapies and he asked what knowledge the doctor had of them. The answers varied from 10 out of the 86 who knew a lot about hypnosis to 80 of the 86 who had never heard of the Alexander Technique.

The next question he asked was "What was their attitude to the alternative therapies?" Again 76 of them thought hypnosis was useful and 86 did not know if the Alexander Technique was useful. He then asked them if they wished to train in an alternative therapy and the only therapies they chose were hypnosis, manipulation, acu-

puncture, homeopathy and herbalism. Seventy of them chose hypnosis and of those 70, 15 were already users of the method. The other therapies came well down the list. Lastly, he asked them if any of them had received alternative therapy, and there was a fair response, in fact 25%. Hypnosis was the most popular therapy. Some of the doctors had also consulted lay practitioners. Strangely enough, at that time, younger doctors and consultants who were also interviewed did not express any great desire to use or be treated by alternative therapy I don't quite know the reason for this discrepancy of views.

For several years now, I have been interested in hypnosis and in my reading I came across an interesting chapter regarding Pavlov (the Russian physiologist). Pavlov, as you know won the Nobel Prize in 1904 for his work which included the conditioned and the unconditioned reflex.

Pavlov found that when experimental dogs were brought into a dark room and completely isolated from the world and a light was flashed, the dogs got a fright, panted and tried to run away (fight and flight reflexes). Other stimuli provoked the same reaction. However, if after a time the alternation of the stimuli ceased and only one and the same stimulus was repeated monotonously, the analyser area of the dog's cortex recognised the insignificance of the signal and cortical inhibition ensued. The above mentioned reflexes (fight and flight) ceased and the animal first reacted with indifference, then with sleepy boredom, finally it went off to sleep. If this experiment is repeated often, then with the first signal, the sleep/hypnotic mechanism will be triggered off. If however, the forebrain is removed, the animal cannot so react and will always react with a fear, fright reflex. Therefore, one might assume with a powerful stimulus such as speech, a monotonous but soothing speech, one can in the human and possibly in other animals, produce the same effect. Therefore, it might be said that hypnosis is part of a conditioned reflex.

I cannot show you any experiments with a dog but I can introduce you to a snake. I will try and repeat an experiment first performed when the children of Israel were just about to leave Egypt. In the Book of Exodus—chapter 4, verses 2-4 and chapter 7 verse 9, there is a reference to what has been described as the hypnotising of a snake. You will have noticed that I held the snake by its head but in the Bible God told Moses to seize it by the tail. In the Talmud, hypnosis is mentioned in relation to certain lizards, scorpions and snakes and indeed as it served as a protection against snakes, it was allowed on the 'Sabbath.'

However, I think I can repeat with the aid of another friend, an experiment first performed 340 years ago in 1646 to be exact. As you well know, there is nothing original in medicine, when you think you have an original thought you invariably find that someone else, some years before, has not only thought about it but has published their findings. Professor Ellis in a letter to the B.M.J. some time ago, replying to another

correspondent who had complained that his recent article on 'Sector Mastectomy' had not been quoted in a review of the subject said "Neither had that excellent account written by his old friend, Dr Laurence Heister of the University of Helmstadt and published in 1735 been mentioned."

The experiment was done exactly 10 years before Father Kircher performed his "Experimentum Mirabile." It was performed by a professor Daniel Schwenter in 1636—350 years ago. Daniel Schwenter was professor of mathematics and oriental studies in the University of Altdorf in Switzerland. He described the bewitchment of a fowl in a book which was published in Nuremberg. Schwenter attributed this phenomenon to the fowl being 'startled,' but as I said, 10 years later the Jesuit priest, Father Kircher, described essentially the same experiment in a chapter in his book entitled—"The Fowls World of Ideas." The chapter was "Experimentum Mirabile de Imaginatione Gallinea Kircheri." The fowl is pressed gently to the ground and a straight or zig-zag chalk line is drawn rapidly forward from the immobilised head or beak. The bird will then remain fixed in that uncomfortable position. If the hold is now released, the bird will remain immobile until it is startled by a definite stimulus such as a noise or hitting it gently. Kircher said that the hen remains immobilised because it thought it was tied to the chalk line.

He first experimented with a fowl with its legs tied. He only cautiously undid the fastening after the creature had been bewitched. He also made further trials with coloured chalks but this did not help to clarify the exact nature of what was happening. Schwenter achieved the same result by placing a wood shaving across the beak of the fowl.

Since then, there has been much argument over the exact nature of these early experiments but no universally acceptable explanation has been reached. Even today the problem is further complicated by the fact that the fowl remains immobile even when the chalk line running from its beak is slowly and carefully wiped away. In fact, when the fowl is seized and its head simply pressed to the ground, it will stay there even when the hand is removed. Although totally immobilised it appears as if its hearing and seeing centres are not totally inhibited as you might expect, but are very wide awake. Even pressing the fowl's head to the ground does not need to be done because if the hen's head is tucked under her wing and she is laid on her side, the hen will remain immobile and sometimes its legs can be put into any position—waxy paralysis—and they will remain in that position until the bird is startled. Indeed when a poultry keeper introduced me to animal hypnosis—he swung the bird round his head two or three times—then when he placed it on the ground it remained immobile. After such a treatment any creature, even a human, might react in the same way.

In line with thinking at that time—1646—Father Kircher did think in his experiments with the fowl that

wonderful magnetic effects were making their appearance. He describes in his work, how mystical effects of cosmic magnetism, both of attraction and repulsion, were gaining credence, not only in the spheres of metals but also in relation to various plants and animals—animal magnetism. It is also interesting to recall that Mesmer who really put Mesmerism/hypnosis on the medical map in the 18th century, first thought that in some way the planets and the stars exerted some influence over men and animals—and he called that planetary magnetism. Later on he suggested there was some ethereal power that emanated and flowed from man to man, man to animal and this could be controlled by magnets and to this he gave the name animal magnetism. The animal magnetism of Father Kircher's day was turned to practical account, by farmers in Hungary. Use began to be made of capons as surrogate mothers for broody hens. After the capons were 'magnetised' by Kircher's chalk line, they were stupified by being given food with an alcoholic content and the chickens were placed under them. They then took over the role of the hen, although otherwise they would have refused to do this and indeed might have been actively hostile to the chickens. This was not exactly a controlled trial with or without the alcohol. In other districts the capons were swung to and fro several times with their head tucked under their wings. The capons conformed most readily and their whole nature turned female when the chickens were placed under them, especially if this was done in the evening. Also their voice and behaviour became hen-like.

At one time, I thought that this had nothing to do with human hypnosis. The hen was responding to her autonomic system, to the adrenaline that was running through its blood vessels in response to the fear and the stress of its fright and of course we know that adrenaline, like many other hormones and neurotransmitters has many actions, depending on the amount of hormone secreted, the site of the receptor and the type of receptor affected. So we can have a fight, flight, faint, freeze evacuation or possibly two or more responses, In the U.S.A. in the late 70s Dr Gordon Gallup repeated these experiments with his hens. Gallup at first believed, possibly still does, that animal and human hypnosis were different entities—the former a pure fear phenomenon. Gallup, however, thought that the effect might be modulated by serotonin so he did controlled experiments in which he injected half of the birds with tryptophan, the precursor of serotonin. Sure enough the hen remained immobile for a much longer period. Gallup believed that the fight or flight response is switched on with chemicals but so is the 'freeze with terror' response. One of Gallup's collaborators believed that a similar effect may occur in cases of rape where the victim ceases to struggle or in cases of agoraphobia where the fear mechanism may be initiated and controlled by serotonin circuits in the brain.

It is suggested that acupuncture might be acting through the endorphin system and it might be that

hypnosis is acting through similar neurotransmitters secreted in greater or lesser amounts in the trance state, depending on whether they are inhibitory or excitatory.

I do not propose to tell you how one induces the hypnotic state except to say that each hypnotist, as a rule, develops a technique of his own and becomes familiar with it. The technique may or may not make use of a fixed gaze, at a point in the wall or on the ceiling or at a bright light. Words are very important, a constant flow of soothing phrases inducing a feeling of mental and muscular relaxation and drowsiness. Sometimes imagery is used—a peaceful, restful sleep inducing scene, like the beach in the sun with the sound of waves lapping on the rocks or the shingle. Then when the image is fixed firmly in the patient's mind, you will find that he is in a trance. Sometimes confusion is used, in its simplest form—simply by counting backwards. In most cases for induction a permissive technique is used. Very occasionally authority is used. The hypnotist tells the patient he is going to be hypnotised or the hypnotist stares at the patient's eyes, or the hypnotist startles the patient with a specific command like "go to sleep." In many cases an authoritative approach works when a permissive technique will not. In a sense, it is like seizing the hen and you startle the patient into a trance state.

I have used in children an ECG monitor with which I have shown, especially the asthmatics and the enuretics, how they can control the function of their organs like the heart; how they can speed up and slow down their heart rate (sinus arrhythmia) and then to further induce a feeling of drowsiness and to enable them to close their eyes, I turn the gain (on the ECG machine) down and down until there is hardly any trace left. By this time, the child's eyes are closed and he is in trance. One learns all these little tricks and you familiarise yourself with a particular sequence so that you, the hypnotist, are never at a loss for a word. Sometimes the patient goes into trance within a few minutes. If they do not do so within 5 minutes, then you can be sure that you are wasting your time on this occasion. So you re-explain to your patient what you are trying to do and try again. It might work, it might not.

Generally patients who are not and will not go into trance, swallow, cough, ask questions, fidget—good indications that they, at least for you, are not good trance subjects.

I would say, a comfortable chair or a couch, a warm room, night time for kids are all prerequisites for success. About 90% of patients are hypnoidal, that is they will do what you suggest but they are not necessarily in trance. Of the 10% who do not go into trance for you, 90% will go into trance with some other hypnotist and 10% are not hypnotisable at all. Of the 90% hypnoidal subjects—about 5% are really good subjects and can go into deep trance—another 10% are medium trance subjects and the rest are light trance subjects.

I am often asked how do you know when patients are in trance? Well, first of all the trance state must be defined. Simply put, it is a state of mind somewhere between wakefulness and sleep. A more lengthy, but more exact definition is "hypnosis is an unusual (or altered) state of consciousness in which distortions of perception (possibly including those of place or time) occur as uncritical responses of the subject to motions from an objective source (usually the hypnotist) or a subjective source (his own memory) or both." For example the hypnotist may suggest that the patient sees an object not present—that is, he is hallucinating, this is one of the phenomena of a deeper trance state or simply perceives that his arm is so light that it is floating upwards—this being a phenomenon of a lighter trance state. If the subject behaves as if he has such experiences, reports that he has them and (as far as can be ascertained) believes that he has them, he is regarded as being in a state of hypnosis.

There are other theories about hypnosis and these might be called the psychological views. First of all, Charcot thought that the hypnotic state was a kind of hysteria that could be induced in constitutionally predisposed subjects. Bernheim and Liebau thought that suggestion was the inducing agent—witness the effect in many treatments and therapies, and the placebo effect. Nowadays, increased suggestion is regarded more as one of the phenomena of the trance state, rather than as an inducing mechanism. Janet had long perceived that the essence of hysteria lay in dissociation and regarded the hypnotic state as part of that phenomenon. Freud apparently was not a good hypnotist by all accounts, but he regarded the trance state as if there was some special rapport between hypnotist and patient. Barber in 1969 said that the state was essentially that of role-playing in a highly motivated subject. In experiments with students, it would appear that highly motivated students could perform as well as hypnotised students. These experiments did not therefore prove that motivation and hypnosis were identical but neither did they disprove the existence of hypnosis. However, if you attend a performance of hypnosis by a stage hypnotist, it is very difficult to rid your mind that in fact what you are seeing is role playing in highly motivated persons, perhaps aided and abetted with a little alcohol. Mearns in 1960 thought that hypnosis was a state of atavistic regression in which there was a return in the patient's mind to a more primitive form of mental function in which critical thought is suspended and emotion left uncontrolled. He suggested that this mental state may possibly be associated with a neurophysiological freeing of the limbic system from cortical control.

Hypnosis is often equated with a sleep state which it is not, but a good hypnotic subject gives the very real appearance of being asleep. Many doctors wrongly believe that hypnotised patients are asleep and conversely, many patients after you have brought them out of trance, are astounded that they were not asleep.

Many researchers have sought for some physiological

definition of hypnosis but none is yet possible. However, advances in neurophysiology offer plausible ideas as to the physiological mechanisms associated with the induction of hypnosis and also offer grounds for productive speculation as to the neurophysiological concomitants of hypnotic phenomena, hitherto described in physiological terms.

Dr Wyke said in 1970, a monotonous, soothing voice associated with fixation of gaze, leads to a blockade of all sensory pathways due to counter discharge from the central reticular formation inhibiting sensory input. The patient becomes eventually barely in touch with his environment. Meanwhile, if only the auditory channel is kept open by enough variation of tone and content, an abnormal waking state between ordinary wakefulness and sleep is established. Of course, something like this happens when you are in a railway carriage, you are drowsy and there is a regular monotonous stimulus like the old clackety-clack of the rail junctions or the regular sequence of evenly spaced telegraph poles seen passing by through the carriage window. In this situation, you seem asleep, you day-dream—perhaps relive past experiences. There is perhaps lack of cortical function but in fact you are awake.

I would like to enlarge on one of those points—E.E.G. changes in the hypnotic trance state. The E.E.G. of a hypnotic patient is not that of a sleeping patient but is exactly like that of a walking one. That statement was true some years ago, it still is today, if you just look at the E.E.G., however, with computer analysed tracings the computer can pick out the differences so that nowadays one can tell whether or not a patient is hypnotised, Ulet et al in 1972 found increased alpha and beta activity in comparing the E.E.G.s of hypnotised subjects with their normal waking E.E.G.s. They also found a significant decrease in slow activity in the hypnotic state. Also when poor subjects were given a dose of LSD (10 ug) orally, it was found that the drug significantly increased hypnotisability in comparison with placebo, and with no drug at all. LSD produced a decrease in slow waves and an increase in alpha and beta activity. When hypnotised after receiving LSD, the subjects showed a further decrease in slow activity; and a further increase in alpha and beta activity. Also when poor subjects received a dose of dexamphetamine (10 ug) orally, hypnotisability improved, to a significantly greater degree than after placebo. It is noteworthy that both LSD and dextro-amphetamine are drugs with an 'introverting effect,' decreasing contact with the external world through the sense organs and increasing fantasy, very much like what happens in the trance state.

Therefore these physiological and pharmacological experiments confirm that there are characteristic E.E.G changes in the trance state, although as I have said, the general non-analysed appearances are those of the waking state. These changes can be mimicked by drugs that produce psychological changes somewhat reminiscent of the hypnotic phenomena and these drugs also facilitate hypnosis.

I would now like briefly to touch upon what are called the stages and the phenomena of the trance state. The trance state can be divided into five components: The hypnoidal state, light trance, medium trance, deep trance state and somnambulistic state. The deeper trance state is only achieved in a small percentage of patients and as for the somnambulistic state, it is found in an even smaller percentage of patients.

There are many phenomena associated with the trance state. I wish to speak only on three of them: suggestibility, memory facilitation and auto-hypnosis.

Man is a highly suggestible creature—witness the power of the advert. However, there is no doubt that when a patient is hypnotised, or even only hypnoidal, his suggestibility increases. His critical reasoning powers are in abeyance and he will take in and store in his long-term memory any advice that you give him, he will also accept the idea that in times of stress he can relax and calm himself just as if he is in the trance state.

The late Andrew Tindal used to lecture on the effect that hypocarbia had on patients' mental faculties. He used to say that when the fair came around and girls were on the steamboats or the swings, they hyperventilated, became hypocarbic and became a little drunk, after which they are easy game for the boys at the back of the stalls and there was an increase in the birth rate 9 months later.

I note that in 1976 Dr Lum postulated the same theory that a lot of psychosomatic illness is caused or aggravated by over-breathing and hypocarbia and that when this is suggested to patients and then when they are taught to relax and breathe properly with hypnotherapy, those attacks are alleviated, aborted or totally controlled. There is no doubt that memory is facilitated in the trance state. Names, places, events that you thought you had forgotten come streaming back. This is the reason that hypnosis is supposedly playing a bigger part in forensic science. There are drawbacks to this, however, for it is well known that some witnesses pick up from the interviewer, hints of what the interviewer wants to hear—and they give to him that information which has been perhaps unconsciously (or should I say, consciously) sought—so I think that the authorities are very wary of evidence about a crime, obtained from a witness, in a trance state. Guidelines have been issued: the interview must be taped. The hypnotist must be a disinterested party. No leading questions have to be asked. In some states in America, evidence obtained from patients who have been hypnotised is not admissible. Indeed I believe that those hypnotised witnesses are not allowed in court.

Auto-hypnosis can be taught to patients very quickly. In this way patients realise that it is they, themselves, that are effecting the cure, alleviating the asthmatic attack or controlling the migraine. Also, by so doing, you diminish their dependency on the hypnotist. If they are paying, you save them money.

Lastly, what do I use hypnosis for, and in what conditions or situations would I advise hypnotherapy? First, as regards the addictions—alcohol, smoking, obesity—I find that, at least in my hands, the success rate is almost nil. Other hypnotists, especially lay hypnotists, report great success. Likewise with pain relief. I find that it is of little value, but again other colleagues have wonderful cures, like transferring incapacitating headaches to the patient's little finger. However, I have found in hysterical paralysis that cures can be achieved very quickly. Likewise, patients with various phobias can be helped considerably. I have had great success with asthmatics and enuretics, not that I cure or treat the asthma but I teach asthmatics to relax and control the fear that sometimes arises—like when they have finished their inhaler and wonder if they can get through the night or weekend without one, or the fear that an asthmatic attack is going to start and they get really worked up about it and it does start.

I do think that in every pain clinic there should be someone who is interested in "an alternative therapy"—like hypnotherapy—sometimes just talking to the patient in an understanding way and by listening to him over a long period and not even by hypnotising him as such, you can relieve his suffering.

I do not propose to talk on the 'hazards of hypnotism' except to mention one. There is a danger—a real danger—whenever an anaesthetist has expressed an interest in hypnosis he will certainly get all the cases for which none of his colleagues can find a cure or a therapy, and as a last resort, suggest him.

My time is getting rather short. A Moslem mystic once said: "Perception is for the learned and quotation for the ignorant." I have quoted from many sources and I would like to finish with another quote from Arthur Guedel. He once remarked regarding hypnosis: "There is something to it but wait before using it until you are old enough to be laughed at." My advice to the young anaesthetist of our society is: 'Ignore the laughter and experience a new horizon by exploring this state.'



GUEST LECTURE

TEACHING AND PRACTICE OF REGIONAL ANAESTHESIA

Prof. PHILIP R. BROMAGE



Medicine develops in phases. Like primitive man, it picks up new tools, examines them, uses them and then discards the clumsy or unreliable in favour of more sophisticated instruments of attack, survival or mere adornment. Today we are seeing a vigorous renaissance in the practice and teaching of regional anaesthesia that was unthinkable 20 years ago. Great strides are being made all over Europe, the Americas and in Australasia. This renaissance cannot fail to influence other areas of interest that touch upon it, and if it is successful, the energy released by this revival will alter many aspects of our practice. This lecture will look back over the path that regional anaesthesia has trodden during the past forty years or so to the present time and try to see where that road may lead us in our future practice and teaching.

Historical Perspective of Regional Anaesthesia

Most would agree that no method of anaesthesia is worth teaching or practising unless it is viable within the context of contemporary medical and scientific thought. And so it is reasonable to ask: How strong a hold does regional anaesthesia have on life today, and should anaesthetists-in-training and in practice bother with it? If we look back over the past 25 years we can see that this is not an unreasonable question. In the fifties and early sixties a lingering fear of spinal anaesthesia had blighted the practice of regional anaesthesia in Britain. Curare had carried the day for general anaesthesia and in many teaching hospitals an attitude prevailed that can only be described as almost militant ignorance toward anything concerned with regional anaesthesia and for some years this branch of our practice teetered on the brink of oblivion.

A subdued growth survived in the obstetrical anaesthesia services and this kept the art alive, since obstetrics was an area where the functional benefits of regional anaesthesia were obvious for all to see, and where there was a self-indulgent spin-off for those who sought to practice obstetrics like a commercial office, from 9 in the morning until 5 in the afternoon, with the help of oxytocin-driven labour and epidural analgesia to keep the patients quiet. Then came a gradual realisation of the functional advantages of regional anaesthesia in other fields, culminating in the enthusiastic surge to exploit the unique advantages of intraspinal narcotics that began in 1979.

Today, the art and science of regional anaesthesia seems well entrenched, and it is as widely taught and practiced as it was before it withered away in the limelight of acrimonious court proceedings that followed the disastrous Wooley & Roe case in 1953 (1). But we should remember that it took the publicity of only two cases of spinal paralysis to ruin a whole technology for a period of about 15 years. Can the same cycle of discouragement and defeat be repeated? The answer is: probably yes. If we look to North America today we see a society plagued by litigious traditions where the system of contingency fees allows every citizen and every lawyer who is so inclined, to batten on the "deep pocket" of medical malpractice insurance. In this game of legalised multi-million dollar roulette, the highly visible profile of regional anaesthesia offers a tempting target that is hit all too often, and it may be easier for the anaesthetist to abandon such an exposed position and seek the more sheltered route of general anaesthesia. We shall see. But, with this rather daunting historical background I would like to emphasise the importance of adopting a philosophy of what I call Creative Pessimism. Creative Pessimism is essentially the art of looking and living on the bright side while anticipating a cataclysmic outcome in everything we do. It is what we all exercise when we drive down the M1 from Edinburgh heading for Picadilly Circus, but it is also the prelude to safe and effective anaesthesia in all its aspects.

Any medical technique must meet three criteria if it is to survive. First, it must be needed. Second, it must be safe. Third, the necessary resources must be available to prosecute the technique.

Advantages and Applications of Regional Anaesthesia

Regional anaesthesia has two main functions. First, it should bring the patient safely through the surgical procedure and second it should ensure that function is restored as rapidly as possible, so that recovery is hastened and complications are avoided. Regional anaesthesia has several advantages on the first count and it is unique in the second. Good practice should

be directed towards exploiting all these potential advantages. The whole point of regional anaesthesia is missed when these advantages are ignored, or when they are not used to full effect. Local anaesthetic agents which cause prolonged operative motor blockade are antithetical to these principles and should be avoided, since they defeat the objective of early restoration of function.

There is no shame in adding or combining light endotracheal anaesthesia when it is appropriate for patient comfort, as a form of social sleep, or when effective gas exchange requires it. Examples of such situations are:—

- 1 Major abdominal surgery
- 2 Thoracic surgery
- 3 Prolonged peripheral surgery (e.g. finger or hand reimplantation of long duration exceeding six hours of operating time).

Major hip surgery does not fall into this category and total hip replacements can be managed perfectly under regional alone, especially if an epidural narcotic, such as sufentanil, is added to the epidural local anaesthetic.

In epidural analgesia it is prudent to use a continuous catheter technique so that the changing demands of changing conditions can be matched precisely by the different functional qualities of the various agents that are available. For example, major abdominal or thoracic surgery require rapidly controllable and powerful agents which will provide excellent analgesia and intra-operative relaxation, but which can be timed to wear off at the end of operation. Postoperatively, sensory analgesia alone is indicated with a dilute solution of a long-acting agent such as bupivacaine, so that the patient can be pain free and yet able to move his legs and perform calf exercise and "quadriceps drill," and perhaps even ultra-early ambulation as soon as possible after he leaves the operating table.

Day surgery for hernia repair is a perfect example of the type of case where early restoration of function is especially useful. The operation may be performed under epidural analgesia with chlorprocaine or carbonated lidocaine, and then a single block of the ilioinguinal and iliohypogastric nerves with 0.5 per cent bupivacaine plus adrenaline, will provide intense analgesia for 7-10 hours, while allowing the patient to take a taxi home and to care for himself until he is comfortably settled in his own bed among his own family.

Complications

A detailed knowledge of all the possible complications of any technique is essential, and constant informed vigilance must be exercised to avoid potential pitfalls. The legal phrase "standard of care" must be uppermost in the mind of the anaesthetist. This is the exercise of creative pessimism. For example, gas exchange should be monitored whenever regional anaesthesia is combined with powerful narcotics, and especially if those narcotics are administered in the

spinal canal, for insidious and sudden respiratory depression is an ever present danger. Continuous end-tidal CO₂ sampling by nasal catheter and peripheral pulse oximetry are appropriate safeguards under these circumstances (2).

When neurolytic injections are used for control of oncological pain it is no longer permissible to inject them without proper x-ray facilities. Thus, phenol or alcohol block of the coeliac plexus must be carried out with an image intensifier in two planes, and correct placement of the needle should be verified with both a test dose of local anaesthetic and a small volume of water soluble contrast medium before the neurolytic solution is injected.

Plant Resources

Induction Rooms

Most forms of regional anaesthesia take time, and space is needed in which the blocks can be performed. These techniques cannot be managed efficiently without the proper use of induction rooms, or a holding area in which blocks can be done in a quiet, leisurely fashion and ahead of the scheduled operating time. Of course there are exceptions. Caudal blocks in children and subarachnoid blocks can be done so quickly that they need cause no delay while operating rooms are changed between cases. However, the majority of procedures require the peace and quiet of an induction room to set up the block and to place any invasive monitoring lines that may be indicated for a major operation. With the proper use of induction rooms, turnaround time between cases is actually faster under regional than under general anaesthesia. For example, sessions in the extracorporeal shock-wave lithotripter facility are greatly simplified by having the patients awake under segmental epidural block so that they are able to help in moving themselves in and out of the Domier apparatus.

Other Resources

Anaesthesia has expanded outside the operating suite into the fields of intensive care, maternity and pain management. All of these are 24-hour activities, 365 days per year, and so suitable in-house facilities must be provided for those who are on call at nights, week-ends and holidays. These hospital quarters should include a bed-sitting room with adjacent or adjoining toilet facilities, and all these must be sited close to the operating and maternity suites so that instant care can be provided in case of emergency.

Teaching the Art and Science of Regional Anaesthesia

During the early years of regional anaesthesia, adequate results were achieved very simply as an exercise in applied anatomy. It was only necessary to know where the relevant nerve structures were situated and then lay down a barrage of local anaesthetic on the targets. As understanding has developed it has become abundantly clear that knowledge of peripheral anatomy is not enough. Now the tyro must expand his field of vision into unimagined territories. He must grasp the neuroanatomy of the whole neuraxis to appreciate where pain pathways run, where opiate receptors and

respiratory control centres lie, how cord blood flow is distributed and how it may be affected by his interventions. Wide areas of pharmacology of local anaesthetics, opioids and neuro-amines and peptides must be studied. The physiology of autonomic action, reaction and ablation must be at his finger tips and he must be ready to deal with secondary effects on heart, brain and parenchymatous organs. All these require a solid basis of intensive reading and mental preparation through case discussion and direct observation. Prudence demands that much of this preparation should precede hands-on clinical performance. Films and slide tapes exist to augment this preparatory phase. Life-like models have been designed to train the beginner in proper techniques for limb plexus blocks and for epidural and spinal anaesthesia. Prosected cadaver specimens are immensely helpful to reinforce anatomical knowledge before undertaking blocks on live patients.

Regional anaesthesia is no place for a "see one, do one, teach one" approach. The technical details and fine points of technique are best learned in a master-apprentice relationship, with the teacher and pupil both gloved until the learner is seen to be proficient enough to perform on his own. Difficult techniques, or those with narrow anatomical constraints are best reserved for trainees who have demonstrated consistent proficiency in related areas. For example, only those who have performed 50 successful lumbar epidurals without complications should be allowed to proceed to the thoraco-cervical approach under supervision.

Animal work and volunteer research projects refine knowledge and stimulate innovative approaches. However, the ultimate learning experience lies in becoming a volunteer for a human experiment protocol. This privilege of intimate personal involvement in new knowledge confers a degree of insight and empathy that can be acquired in no other way, and it is ideally suited to those who intend to devote a significant proportion of their time to the teaching, practice and future development of regional anaesthesia.

Research and Vindication of Regional Anaesthesia
Finally, we must understand that regional anaesthesia is a fragile plant, just like any other technical aspect of human endeavour. It is beautiful in the bloom of its power when it meets a real need, but easily killed and cast aside if it does not meet the needs of the times, for it lives only by favour of the pragmatic imperative. This imperative demands solid, incontrovertible data to support the claim that regional anaesthesia is uniquely successful in the three areas that we touched on at the beginning, namely: safety, efficacy and cost effectiveness.

Unfortunately, this kind of hard data is extraordinarily difficult to collect, by nature of the many uncontrollable variables inherent in the postoperative conditions under which data collection must be made. Those of you who have tried to make accurate and repeated measurements of lung mechanics and dynamics at

different epochs for six hours or more after upper abdominal surgery will know how harrowing, exhausting and exasperating the exercise can be for both patient and investigator. You will know how difficult it is to keep base lines constant and to exclude artefacts from leaking gas circuits, or oesophageal balloons that have shifted position just enough to make one's readings questionable. Searchers in this tantalizing maze must burn with an intensive conviction that real differences in outcome do exist between regional and general anaesthesia and that only dogged perseverance will eventually reveal ways to measure those differences objectively and in a compelling fashion.

The key to that conviction lies in the days of thoracoplasty for cavitational pulmonary tuberculosis. Let me take you back thirty five years or so to the late forties and fifties, to share with you some of the indelible memories left from those times. Curare had become available. Some centres adopted general anaesthesia for thoracoplasty and some persisted with regional. At that time my practice included Midhurst Sanatorium, where a team from the Brompton Hospital preferred general anaesthesia, while the bulk of our work was done at Chichester where we used regional. The differences were striking and unforgettable. *Table 1* outlines those differences.

TABLE 1.

ANAESTHESIA FOR THORACOPLASTY (circa 1952)

	General	Regional
<u>Operative</u>		
Induction	Quick	Slow (30-40 minutes)
Surgical Field	Bloody	Dry
Blood Loss	2-4 units	Negligible
Comfort	Complete	Good (with lidocaine)
<u>Postoperative</u>		
Blood Loss	1 unit	1 unit
Recovery	Painful	Painless for 4-6 hours
Respiration	Poor	Good
Physiotherapy	Delayed	Early

I like to believe that those ravaged patients who suffered through that dreadfully disfiguring operation passed on a torch and a clear mandate for us to persist in the difficult quest for the quantitative data that is needed to vindicate the qualitative advantages of regional anaesthesia; advantages that we saw daily in the operating room and afterwards at the bedside.

We have come a little way on that quest for quantitative vindication. A few areas of endeavour have yielded positive results from clinical investigations. Obstetrics was the first to show that refinements in regional anaesthetic technique could produce unequivocal advantages at every level of investigation, from

neurobehavioural studies in the neonate to measurements of adrenal medullary output in the mother (3).

In surgery, diminished risks from thromboembolism seem equally clear, especially for major procedures on the lower limb (4). Today, many centres perform total hip arthroplasty almost exclusively under regional anaesthesia, to the complete satisfaction of patients and surgeons, and with a declining incidence of thromboembolic complications.

It is in the realm of respiratory function that resistance has remained in yielding the sort of supportive data that we need. As an example, stand at the bedside of two morbidly obese patients in the recovery room. Choose one who has received general anaesthesia and muscle relaxants for his gastric stapling, and another who has received a combination of light general and continuous thoracic epidural analgesic. Look at them, listen to their chests and measure their vital capacity and FEV₁. There seems no doubt which of these two patients is better off. With proper technique and management you can get the regional patient out of bed and walking within two or four hours of surgery. The general anaesthesia patient will not and cannot be budged. And yet, try to make the more sophisticated measurements of differences in compliance, respiratory work or FRC during pain and during two different analgesic interventions, and the practical difficulties become enormous and frequently unreliable. Clearly, there is a great need for improved and simplified methodology that will allow us to display these subtle but vitally important respiratory differences that continue to elude formal bedside studies during pain and during different analgesic interventions.

The technical difficulties surrounding measurements of respiratory function in the early postoperative periods have been compounded by the advent of the spinal narcotics. With these techniques regional anaesthesia is flirting with its rival the poppy, and nociceptive blockade is no longer axonal in nature, but in the subtle neuronal networks of small opiate-receptive cells lying in Rexed's lamina 1 and 2 of the dorsal horn. Profound respiratory depression may occur if the narcotics spread rostrally to reach opiate receptors lying just under the ependyma in the floor of the fourth ventricle (5). Thus, the spinal narcotics bring regional anaesthesia full circle back to the age-old dilemma of how to produce narcotic pain relief without causing lethal respiratory depression.

Because of the difficulties encountered in making accurate measurement in postoperative patients, we have turned to laboratory studies in volunteers, using "artificial" controllable pain as a substitute for uncontrolled surgical pain, and hypercapnic ventilatory drive as an index of central respiratory control. We believe that this is the proper and prudent course to take as a routine screening regime, before proceeding to wider clinical trials for all forms of aggressive pain management, where narcotic agents are under investigation.

The data gathered in these ways must be politicised, for in an increasingly cost-conscious world our main task will be to convince ourselves and our administrative colleagues in the health industry that aggressive pain management can win on two fronts simultaneously, and that it can both reduce morbidity and mortality and cut costs through smoother convalescence and shorter bed stay. In the long haul, whether we like it or not, it is cutting costs and reducing financial risks that will shape our professional futures and determine how and when we shall teach and practice regional anaesthesia.

From where we stand today, and through the spectacles of creative pessimism, the view looks encouraging, provided we persist in our efforts to quantitate the physiological results of regional anaesthesia, and provided we can translate these results into favourable scientific and financial terms that will ensure the sanction of our profession, and of the society that we serve.

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A NEW METHOD OF BLOOD GLUCOSE CONTROL



The neuroendocrine response to stress results in widespread metabolic changes. Under hypothalamic control, growth hormone, prolactin and ACTH are released from the anterior pituitary. Increased aldosterone and cortisol are released from the adrenal cortex and antidiuretic hormone is released from the posterior pituitary. In the pancreas, insulin production is suppressed and glucagon production is increased. Sodium and water retention, potassium depletion and increased protein breakdown also occur. These changes result in increased blood levels of glucose, ketone bodies and non esterified fatty acids. The magnitude of this neuroendocrine response is related to the severity of the stress.

Seriously ill patients therefore may have relatively high blood glucose levels and often require insulin administration for control of this. High carbohydrate loads during parenteral nutrition further increase the possibility of hyperglycaemia. The level of stress on these patients often varies during their illness and episodes of sepsis, surgical complications and renal failure all increase levels of stress. The method chosen to control blood glucose in the intensive care unit must therefore be efficient and rapidly adaptable.

PREVIOUS METHODS

Traditionally the sliding scale has been the most widely used method in the control of blood glucose. This involves regular blood glucose measurement and the administration of a subcutaneous or intra-

muscular dose of insulin depending on the blood glucose level. Alberti and Thomas (1979) described a regimen to control blood glucose in diabetics during surgery with a sliding scale of insulin in an intravenous infusion with dextrose and potassium. This method gives reasonable control in stable patients and those with low insulin requirements, but many others require frequent changes of the sliding scale or of the infusion concentrations. Fixed sliding scales are therefore not adaptable enough for use in the intensive care unit.

Two dynamic scales were described in 1980 to control intravenous insulin administration, McWilliam (1980) described a method for use in I.C.U. during the administration of 50% dextrose. This was based on the calculation that a steady state in normal patients is reached by 3 hours during a glucose infusion of up to 0.5g/kg/hr. Reasonable control was achieved for most patients but several required greater increases of insulin than anticipated and more frequent monitoring. Another dynamic scale was described by Woolson (1980) to control blood glucose during nutritional support in ill patients. Several problems were experienced when this regimen was used in our I.C.U. If the blood glucose level falls below 4.0 mmol/L, the infusion is decreased but not discontinued. As the maximum frequency of testing is hourly, there is the possibility of several hours of hypoglycaemia before the insulin is stopped. Also an unstable patient with variable insulin requirements may need frequent changes of the insulin concentration in the syringe.

METHOD

A new method using a slide rule has been designed to incorporate the useful components of previous methods and to avoid their problems.

Side A of the slide rule is used to adjust the rate of an intravenous insulin infusion. Blood glucose is measured by Dextrostix and an Ames reflectance meter. The present blood glucose level is aligned with the previous blood glucose level and the present insulin dosage will be in line with the new insulin dosage to be set. This is read off directly. The slide rule is designed to adjust the insulin according to the following scale.

Present blood glucose (mmol/L)

0-3.9

4.0-5.9

6.0-7.9

8.0-11.9

12.0-16.9

17.0+

Adjustment to be made to present insulin I.U./h.

Infusion discontinued

decrease by or increase by $2(0.7 \times \sqrt{\text{present insulin I.U./h}} - 0.1225)$

decrease by or increase by $0.7(\sqrt{\text{present insulin I.U./h}} - 0.1225)$

No change

decrease by or increase by $0.7(\sqrt{\text{present insulin I.U./h}} + 0.1225)$

decrease by or increase by $2(0.7 \times \sqrt{\text{present insulin I.U./h}} + 0.1225)$

This is illustrated in figure 1.

If, using Side A, the insulin infusion is stopped, Side B is used until it indicates a new infusion rate. When to restart and the dose at which to restart the insulin is determined by three factors—the present blood glucose level, the time since the insulin was discontinued and the insulin dosage prior to discontinuation. The relationship is described by the following equation and illustrated in Figure 2.

New insulin dosage (I.U./h.) = Dosage prior to infusion being discontinued $\cdot m \cdot x$ where

$$X = e^{-t/T} + 0.1$$

t = time since insulin last given (hours)

$T = 1.5$

$e = 2.718$

and m is a value which depends on the present blood glucose level.

Insulin is given by syringe pump but only two concentrations are used (1 I.U./ml and 4 I.U./ml). This avoids frequent changing of the concentration in the syringe. Insulin is automatically commenced by the nursing staff when the blood glucose has been greater than 13 mmol/L for two consecutive hours. Initially, blood glucose is measured hourly and then two hourly when the level has been between 6.0 and 14.0 mmol/L for four hours. It is measured four hourly when the blood glucose level has been between these values for at least twelve hours, the insulin requirement is 4 I.U./h or less and the patient is otherwise stable. All three of these conditions must be satisfied. Measurements are made every 30 minutes if the blood glucose is 3.0 mmol/L or below, the level is falling rapidly or the dextrose or parenteral nutrition has been reduced or stopped. No insulin is given to any patient with a blood glucose level of less than 4.0 mmol/L. 40 I.U./h is the maximum dose of insulin used. If the calculation gives a value of greater than forty, the slide rule indicates that the carbohydrate infusion be decreased by 50% and that the frequency of monitoring be increased to half hourly.

Unlike other methods, the slide rule aims at achieving blood glucose levels of 8.0 to 12.0 mmol/L as there is no harm in modest hyperglycaemia and the mean insulin requirement is less than would be given if control was aimed at lower levels.

RESULTS

This method of blood glucose control has been used in the Intensive Care Unit of Ninewells Hospital, Dundee, since October 1981. This unit admits an average of three hundred patients per year, adult and paediatric (non-neonatal), from both surgical and medical specialties. In 1984, the year chose for this study, two hundred and ninety-five patients were admitted. During that period, thirty nine patients required insulin of which it was possible to study thirty two retrospectively. These were divided into five categories of post-surgical, parenteral nutrition, renal failure requiring dialysis, pancreatic disease and diabetics to determine whether control varied between different groups of patients. The results are displayed in Table 1.

Overall control was found to be very good. When all thirty two patients were assessed together, blood glucose levels between 6.0 and 16.9 mmol/L were obtained 79% of the time. Levels between 6.0 and 11.9 mmol/L were measured for 59% of time. Time to stabilisation was found to be much less than for either the Woolfson or McWilliam regimens.

High blood glucose levels

High blood glucose levels (greater than 17.0 mmol/L) were measured for 9% of the time. Most of these episodes were very short—one or two hour periods and were rarely above 21 or 22 mmol/L. The original instructions had hourly blood glucose measurements only when values were measured over 17 mmol/L, therefore the glucose level was taking longer than necessary to decrease. After this assessment of the slide rule was made, the instructions were modified to include 30 minute measurements when values over 17.0 mmol/L are measured, ensuring faster control of these hyperglycaemic episodes. When surgical intervention was required the insulin tended to be switched off prior to transfer to the operating theatre to avoid the risk of hypoglycaemia. Parenteral infusions were continued and this produced many episodes of elevated blood glucose when the patient returned to the I.C.U., often several hours later. Closer monitoring of the blood glucose intra-operatively now allows the insulin to be continued and these episodes are avoided. The most frequent high values were found in patients who required dialysis (12%) or with pancreatic disease (13%). The fewest episodes of hypoglycaemia occurred in those who were not diabetic and were not receiving a high carbohydrate load.

Low blood glucose levels

Levels of less than 4.0 mmol/L were measured for 3% of time overall. These were mostly between 3.0 and 3.9 mmol/L and the patients were not at risk because clinical hypoglycaemia is rare above 2.5 mmol/L. There were only two instances throughout the study period in which cardiovascular instability occurred during an episode of low blood glucose. The fewest episodes of low blood glucose were obtained with patients receiving parenteral nutrition post surgery (1% of time only).

Glucometer

Ames reflectance glucometers are used in the I.C.U. in which this study was carried out. These are reliable and accurate, but careful maintenance is required and they are now calibrated daily. An accident outwith the period of this study resulted in three days of poor control in a patient due to inaccurate calibration of the glucometer in use.

Acceptability and application

The slide rule has been found to be simple and straightforward to operate. Blood glucose control of a high standard is now achieved by the nursing staff who derive considerable job satisfaction from the increased responsibility. Only occasional medical staff intervention is required. The slide rule was designed initially for use in I.C.U. but its wider application is being explored for use in any situation in which rapid and reliable control of blood glucose is required.

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Table 1. Results Category

Category	Total Hrs. Insulin reqd	% Time in blood glucose ranges (mmol/L)					
		0-3.9	4.0-5.9	6.0-7.9	8.0-11.9	12.0-16.9	17+
All patients (n=32)	6087	3	10	20	39	20	9
Dialysis (n=8)	3562	3	9	18	36	21	12
Pancreatic Disease (n=4)	1653	4	11	18	33	19	13
Post Surgery with Parenteral Nutrition (n=11)	1193	1	7	20	49	18	5
Non Diabetics with no Parenteral Nutrition (n=8)	676	3	11	23	44	16	3
Diabetics (n=5)	353	5	11	18	32	28	6
Surgery Alone (n=5)	256	7	12	18	32	25	7

Figure 1

Graph showing the progressive increase in increment by which the insulin dosage is increased

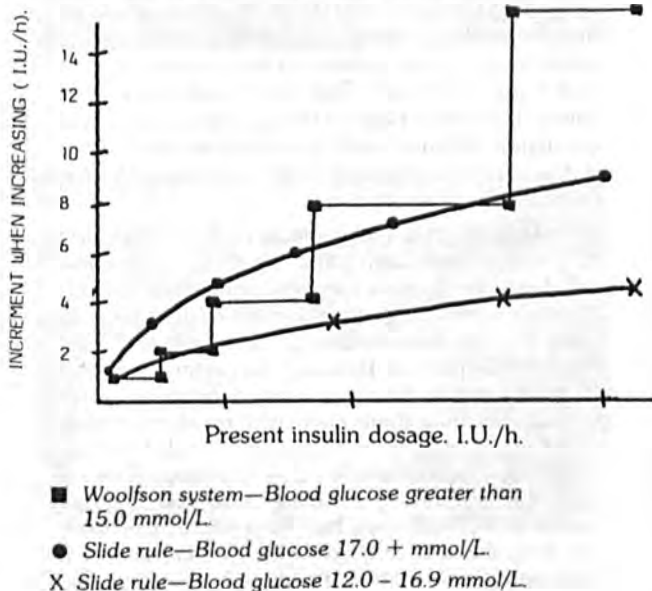
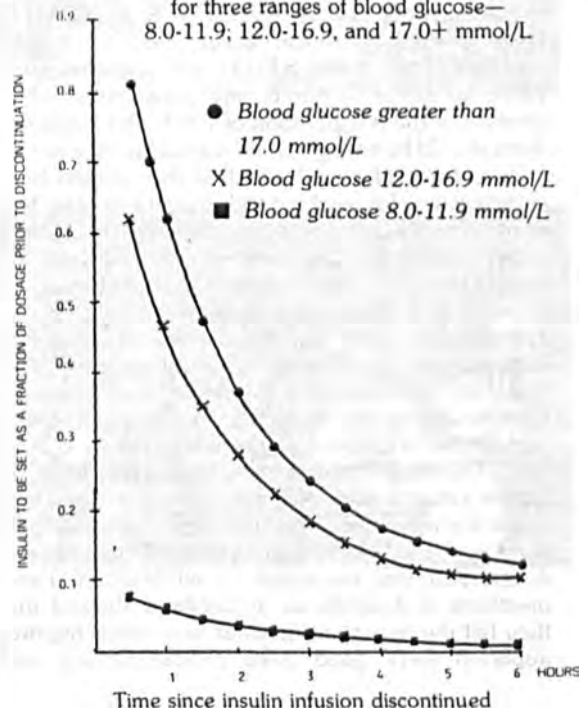


Figure 2

Graph of insulin dosage when recommencing infusion in relation to the time since insulin discontinued for three ranges of blood glucose—8.0-11.9; 12.0-16.9, and 17.0+ mmol/L



REGISTRARS' MEETING

NINEWELLS HOSPITAL, DUNDEE, JUNE 6th

Over forty registrars from all parts of Scotland attended this year's meeting. In the morning they were split into various groups to attend lectures and demonstrations. Two groups travelled to Dundee Royal Infirmary where one group saw Dr Tom Houston demonstrate facet denervation for the treatment of back pain, using X-ray control and a radio-frequency lesion generator. The other group went to the orthopaedic theatre suite and saw two techniques of local anaesthesia in the lower limb. Dr Gillian Hood demonstrated the local infiltration and intra-articular injection of prilocaine for arthroscopy of the knee and Dr Bill Macrae showed sciatic and saphenous nerve blocks at the knee for operations on the foot. The other groups stayed in Ninewells and attended lectures and demonstrations on a variety of topics. Dr Rae Webster demonstrated the slide rule designed in the Intensive Care unit at Ninewells, for controlling insulin dosage in patients in the I.C.U. The use of the cerebral function monitor in theatre and the I.C.U. was discussed by Drs McGowan, Shearer and Grant. Dr Alan Semple talked about the use of epidural opioids and Dr Mel Thomson examined the hazards of anaesthesia for surgery using lasers.

In the afternoon session there were two lectures, and the Chairman was the President of the Society, Dr Alastair MacKenzie. The first lecture was given by Sir James Fraser, Post-graduate Dean of the Faculty of Medicine at the University of Edinburgh. Sir James gave a most interesting talk about anaesthetic staffing in Scotland, based on his experience as chairman of the working party set up by S.C.H.M.S. and S.H.H.D. He reviewed the historical background to the present problem of too many S.H.O.s and registrars compared to senior registrars and consultants, which stems from the Wright report of 1964. This stated that there should be enough junior staff to fulfil the service needs of each hospital and that they should have sufficient time for teaching and study (i.e. at least 30% of their work being directly supervised). This led to a large, generally unsupervised expansion of junior posts with the resultant present imbalance at registrar to senior registrar level. Wright also recommended that senior registrar posts should be strictly supernumery in Scotland (unlike England and Wales) and that their numbers should be tied closely to expected consultant vacancies. As a result there is no real promotion problem for senior registrars in Scotland. The big problem remains at registrar level. Sir James recently reviewed the C.V.s of most senior registrars in Scotland which showed that virtually all were appointed from teaching hospital registrars and a questionnaire circulated to all National Panel members in Anaesthesia in Scotland showed that they felt the important qualities in a senior registrar applicant were good basic clinical training and

experience plus an ability to get on with colleagues at all levels, rather than publications or research interests.

As to the future, Sir James foresaw an inevitable curtailment of junior posts with the numbers carefully tailored to expected senior registrar and consultant vacancies. This would entail more rigid training schemes with the careful selection of prospective career anaesthetists at entry to the specialty, probably by a more formal interview panel including psychologists as well as anaesthetists. Some posts would inevitably be lost through rationalising on-call commitments and some could be reserved exclusively for overseas graduates, attached to departments on regular rotations, but not competing for senior registrar posts at the end of their training. Despite this, there may well be inadequate numbers of junior staff to cover important on-call commitments such as obstetrics and intensive care units. Alternative cover either by increased numbers of consultants or of associate specialists/clinical assistants might prove necessary, a limited number of holding posts with no on-call commitments could be provided for post F.F.A.R.C.S. registrars in District General Hospitals or in research posts until substantive senior registrar posts became available. Sir James had also found warm support from District General Hospital registrars for integration into Teaching Hospitals for training although the same enthusiasm was lacking among their Teaching Hospital counterparts.

Sir James concluded his talk by stating that, although nearly finalised, his report will not be published for about 18 months to await similar reports on other hospital specialties. It was therefore impossible to put precise numbers on the amount of junior posts that might be lost or the number of new consultant posts that might be created. The obvious relevance of Sir James' talk was not lost on those present, and a lively discussion followed with contributions from junior staff and consultants, from both Teaching and District General Hospitals.

The second lecture was given by Dr R. D. Stark from I.C.I. Pharmaceuticals and entitled "Diprivan—development of a new intravenous induction agent." Dr Stark outlined the development of diprivan since initial investigations began 12 years ago with Dr I. Glen in the Clinical Research Department of I.C.I. Pharmaceuticals. The aim was to produce a new intravenous anaesthetic agent with rapid onset, short duration of action, lack of cumulation and absence of excitatory effects. Diprivan, 2, 6, di-isopropylphenol, appeared promising in these respects following animal and clinical trials, but being insoluble in water, was formulated in cremophor EL. The latter's role in hypersensitivity reactions precluded general release. Diprivan has now been reformulated in intralipid and has just been released for general clinical use.

A large amount of experimental clinical work has been carried out in several centres on the new formulation and Dr Stark reviewed the findings. The pharmacokinetics are extremely attractive with short redistribution and elimination half lives of 2.5 and 35-50 minutes respectively and it is rapidly metabolised by the liver to inactive metabolites which are excreted in the urine.

An induction dose of 2-2.5 mg/kg in adults produces anaesthesia in one arm brain circulation time. Mild hypotension and apnoea are common following induction but have not caused problems clinically. Quality of induction is generally very good. Elderly and debilitated patients require a lower induction dose at around 1.5 mg/kg. Diprivan has been used widely for maintenance of anaesthesia either by intermittent bolus or continuous infusion, either alone or in combination with nitrous oxide, fentanyl, alfentanil or regional blockade. This has proved clinically acceptable, a mean administration rate of

between 0.1-0.2 mg/kg/min being required to produce satisfactory anaesthesia.

Recovery from diprivan anaesthesia is particularly rapid with a low incidence of post-operative side effects. There is an overall 28% incidence of pain on injection when a hand vein is used for injection, most cases being mild or moderate. This falls to 6% with larger veins. Diprivan has no specific inhibitory effect on cortisol synthesis unlike etomidate and has no propensity to produce anaphylactoid reactions.

In summary diprivan has been shown to have many features of the ideal intravenous induction agent and is particularly suitable for day case surgery and for infusion anaesthesia.

The President brought the meeting to a close by thanking the participants and particularly Drs Ian Grant and Neil MacKenzie who organised the meeting.



SCIENTIFIC MEETING

KELVIN CONFERENCE CENTRE, GLASGOW, NOVEMBER 21st

The 1986 Annual Scientific Meeting was hosted by members of the Anaesthetic Department of the Western Infirmary, Glasgow. The Kelvin Conference Centre provides an ideal setting for a meeting of this size with an excellent lecture theatre, a dining room and coffee area in one compact suite. The President welcomed everyone to the meeting and apologised that in contrast to the Peebles Meeting he would not be producing any hens or snakes! Dr Douglas McLaren chaired the morning session and his mixture of wit and good time-keeping constituted a lesson in the art of good chairmanship. The afternoon session

was chaired by our president in his own inimitable style! Summaries of six of the presentations are printed below. All the presentations were of a very high standard and those present particularly enjoyed the presentation about the problems of high altitude given by Dr Winifred Finlay. After tea the Gillies Memorial Lecture was given by Dr Alastair Masson from the Department of Anaesthetics, the Royal Infirmary of Edinburgh. Following this excellent lecture Dr Deirdre Gillies presented the Gillies Memorial Vase to Dr Masson.

SPINAL ANAESTHESIA, SAFETY AND PRACTICE

Dr J. THORBURN

Spinal anaesthesia has been in clinical use for 86 years, yet its place in the anaesthetic armamentarium is not yet fully established. It is a technique used usually by enthusiasts who are not unbiased, and among whom I number myself, and very infrequently used by others.

Initially spinal anaesthesia was rapturously welcomed, although its disadvantages were quickly recognised, headache, hypotension and occasionally, respiratory failure. For the first 40 years many studies reported post-spinal mortality and rates of 1:740 in the early years to 0:10,000, suggested that it was apparently safer than general anaesthesia. The incidence of headache was reduced with the use of small gauge needles to the acceptable incidence of 3.5% and extensive American studies confirmed its safety.

Spinal anaesthesia had a number of distinct advantages, both the blood loss and the incidence of deep vein thrombosis is reduced as is the requirement for blood transfusion, perhaps a very important factor today. However, the use of spinal anaesthesia is not

without its problems, the time taken to perform the block can be irritating, as can failure. The effects of a high block can be profound and surprisingly rapid in onset. If an extensive block is produced then cardiovascular support may frequently be essential. Following spinal anaesthesia with 3 ml of bupivacaine plain solution, almost 50% of patients require some form of cardiovascular support, the need occasionally being urgent. Similar changes occur following spinal anaesthesia induced with bupivacaine in glucose or with cinchocaine.

We have a duty to our patients to teach the technique obsessively carefully to our junior staff. The side effects can be reduced if small doses are used, but if so the failure rate will be higher, and general anaesthesia required more often. Indeed, both should be administered if modest doses are used. If larger doses are used, the physiological trespass is more severe; it must be expected and dealt with rapidly, with a skill based on knowledge and experience.

OPERATING THEATRE POLLUTION IN GLASGOW

Dr W. M. GRAY

Epidemiological and animal studies strongly suggest that exposure to waste anaesthetic gases presents a health hazard to hospital staff. It is therefore necessary to minimise spillage of waste gases and to monitor the exposure of staff to these gases. The anaesthetics community in Glasgow has had a special interest in this problem for several years, largely stimulated by the pioneering work of Professor Alastair Spence. In this

talk, I described the method developed in Glasgow for pollution monitoring, and presented the results of surveys carried out in several Glasgow hospitals.

The exposure of individual staff members to nitrous oxide is monitored using a personal diffusive sampler manufactured by Perkin-Elmer. The samplers are packed with a suitable absorbent (Molecular Sieve 5A) and are worn on the theatre gown, close to the

breathing zone, for the duration of a single operating list. The absorbed substances are then released by thermal desorption, analysed by gas chromatography, and detected by a hot wire detector. The signal from the detector is processed by a computing integrator, which indicates the mass of N₂O released from the sampler. Knowledge of the uptake factor for the tubes, obtained experimentally, then allows calculation of the integrated exposure, in ppm.h, from which the average exposure, in ppm, can be obtained if the exposure time is known. The thermal desorption unit (Perkin-Elmer ATD 50) can automatically process up to 50 samplers, and the samplers can be re-used indefinitely.

Surveys have been carried out in several Glasgow hospitals. Every theatre in each hospital was surveyed for a week, with samplers being worn by the anaesthetist, ODA or anaesthetic nurse, and circulating nurse. A fresh sampler was worn for each operating session. For each hospital, the results were presented as a mean, standard deviation and range for each category of staff, and, in addition, the percentage of samples for each category for which the average N₂O exposure was greater than 100 ppm was shown. This latter figure is the statutory limit in Sweden, and is a convenient reference level for the present study.

The results from the Western Infirmary and Gartnavel General Hospital are shown in the table. These sites were extensively surveyed during the development of the sampling method, and the results form a comprehensive reference set against which the results from other hospitals can be judged. It can be seen that the anaesthetists received the highest exposure, with close to 50% of the samples in excess of 100 ppm, while the corresponding figures for the ODA and

circulating nurse are less than 10%.

Survey results from other hospitals in Glasgow were presented. In three hospitals, the exposures were markedly higher than those found in the Western Infirmary and Gartnavel Hospital. In two of these (Dental Hospital and Royal Hospital for Sick Children), the increased pollution could be attributed to the difficulty in carrying out effective scavenging for the typical procedures in these hospitals. In the third (Southern General Hospital), the operating theatres are older and perhaps less well ventilated than those in other hospitals. One interesting finding was that in two of these hospitals the anaesthetic nurse received a dose of greater than 100 ppm on about 50% of the sampling periods. The Institute of Neurological Sciences, in which a typical operating list consisted of one or two long cases, produced the lowest exposures of all the hospitals surveyed, with the average anaesthetist's exposure being 97 ppm.

Some of the exposures found in these surveys seem undesirably high, and investigations are currently in progress into possible causes of these high exposures. Preliminary work suggests that a considerable part of the exposure arises in the anaesthetic room, where it is often difficult to carry out effective scavenging.

Our experience in conducting these surveys has shown that the use of the diffusive sampler permits simple and reliable monitoring of personnel exposure to waste anaesthetic gases. The administration of the monitoring service is now being taken over by the Greater Glasgow Health Board's Occupational Health Service, who will continue to carry out surveys in Glasgow hospitals, as required by the Health and Safety at Work Act.

TABLE: Summary of personnel exposures in 17 operating theatres in the Western Infirmary and Gartnavel General Hospital, Glasgow.

	No. of samples	N ₂ O exposure/ppm			No. of samples >100 ppm
		Mean	SD	Range	
Anaesthetist	111	139	183	4-1400	50 (45%)
Nurse	111	45	82	2- 780	9 (8.1%)
ODA	104	48	46	3- 310	8 (7.7%)

STUDY OF AUTOMATIC CONTROL OF GENERAL ANAESTHESIA

Dr JOHN ASBURY

The objective of this study was to investigate whether a simple computer based feedback system could maintain clinically satisfactory general anaesthesia using arterial pressure to represent depth of anaesthesia in fit ASA I patients.

METHODS

An RML 380Z-D microcomputer was programmed in BASIC to automatically receive digital arterial pressure and heart rate information from a Critikon Dinamap 1846. The programme then calculated a new rate setting for a modified IP3 syringe pump, and implemented it. The pump was loaded with a 50 ml syringe containing alfentanil (200 ug/ml) and methohexitone (4 mg/ml) (AM), which conveyed the drugs to the patient's venous system via a large bore cannula.

For each patient a target systolic arterial pressure (TSAP) based on age and sex was calculated from tables of normal values, and typed into the computer. The Systolic Arterial Pressure (SAP) values were first exponentially smoothed, and then the programme calculated the difference between TSAP and the current smoothed SAP to give an error value. This error was used to drive a simple proportional-integral control algorithm whose output controlled the syringe pump.

Anaesthesia was induced in 20 ASA I patients with methohexitone, and intubation facilitated with suxamethonium. The lungs were inflated with 66% N2O in oxygen and neuromuscular blockade maintained with intravenous boluses of atracurium according to the response to a nerve stimulator. In theatre the Dinamap was connected, and the syringe containing AM connected to the patient's cannula. After a 5 ml bolus of AM the control algorithm sampled the SAP at one minute intervals for four minutes and then surgery started. During surgery Hartmann's solution was infused as required.

The adequacy of anaesthesia was assessed clinically by an independent anaesthetist, and by calculation of the extent to which the patient maintained his SAP at the TSAP value. The patient was also questioned

twice during the first 24 hours postoperatively. The adequacy of the immediate recovery period was evaluated by a scoring system.

RESULTS

Four female and sixteen male patients gave consent for this study, their mean weight was 67.6 kg and their mean age was 43.5 years. None of the patients were aware under the anaesthesia and in all but one case the intraoperative management by the computer was to the satisfaction of the independent anaesthetist. In this unsatisfactory anaesthetic the dosage of AM rose unexpectedly rapidly and the patient began to sweat. The study was abandoned, and the patient was subsequently found to have a heavy alcohol intake, a fact which he had not revealed. Two of the patients failed to breathe at a tidal volume of 300 ml 15 min from the end of the operation, and 0.1 mg of naloxone was given. This produced an abrupt recovery in both cases.

In the remaining 17 patients the mean duration of automatic control was 48.9 min and the median alfentanil dosage was 1.29 ug/kg/min with a range of 0.38 to 4.53 ug/kg/min. The root mean square deviation about TSAP was calculated in each case, and in the 17 patients the median value was 8.5% with a range from 6.3 to 17.3%. All 17 patients reached the top recovery score within 15 min, and the median time to their giving a correct date of birth was 4 min with a range from 2 to 15 min. The median time to complaint of pain was 6 min with a range of 3 to 40 min.

CONCLUSIONS

The quality of automatic control in these patients was very variable, but in none of these patients were there dangerous changes in SAP. This also suggests that SAP while not completely representing depth of anaesthesia, carries enough information to allow automatic control. The method could probably be improved by additional information such as that from the EEG, and possibly the rate of lower oesophageal contractions.

INTRA-OPERATIVE SPINAL CORD MONITORING DURING SCOLIOSIS SURGERY

Dr S. CAIRNS

Spinal fusion is a standard method of treating scoliosis. The operation carries a small but significant risk of neurological damage. In 1974 MacEwan found an incidence of paraplegia of 0.3%. The use of a Harrington distraction rod increases the risk of cord damage. Evidence from several centres has shown that early diagnosis of cord damage and early treatment by removing the Harrington rod or reducing the

distraction, improves the chance of full neurological recovery.

It is now the custom in many centres to carry out intra-operative spinal cord monitoring. The two methods are:

- 1) The wake-up test.
- 2) Monitoring somato-sensory evoked potentials.

In the wake-up test, the patient is awoken after rod distraction. He is asked to demonstrate normal cord function by moving his toes. After the test has been carried out he is re-anaesthetised. For a successful test, the patient must be carefully chosen and prepared.

The premedication and anaesthetic technique must take into account the need for

- 1) Rapid recovery of consciousness: without confusion or restlessness.
- 2) Sufficient analgesia to produce temporary suppression of protective reflexes.

The anaesthetic must also take account of the conflicting need to produce a minor degree of hypotension in order to reduce blood loss. The wake-up test had been successfully used in many centres. It does, however, have disadvantages. It requires patient co-operation, it is risky and it interrupts a smooth anaesthetic.

The second method of intra-operative cord monitoring is the measurement of Sensory Evoked Potentials or S.E.P. The principle of the technique is as follows: A standard electrical stimulus is repeatedly supplied to the peripheral nerve. In scoliosis surgery the nerves used are the posterior tibials. The electrical responses evoked in the central nervous system are picked up by E.E.G. electrodes applied to the skull or upper neck.

These signals are amplified and averaged. Any random signals are discarded. The final result is displayed as a plot of voltage against time. Damage to the spinal cord produces two changes in the evoked response.

- 1) A reduction in peak amplitude.
- 2) A delay in conduction time.

The response evoked in the sensory cortex is influenced by a number of factors including depth of anaesthesia. The amplitude of the evoked potentials falls as anaesthesia is deepened. The evoked response from the subcortical regions of the brain is less sensitive to depth of anaesthesia. This has obvious implications for the anaesthetist trying to provide a smooth hypotensive anaesthetic.

In the Royal Hospital for Sick Children the subcortical response is nowadays monitored by an active skin electrode over the second cervical spine. There is an accumulating body of literature which suggests that measuring the evoked response gives a good indication of early damage to the spinal cord. Corrective measures immediately carried out by the surgeon or occasionally the anaesthetist will usually restore the evoked response to normal and lead to normal cord function post-operatively.

OPHTHALMOLOGICAL COMPLICATIONS OF CARDIOPULMONARY BYPASS

Drs A. D. McLAREN AND T. ALGIE

Despite marked lowering of mortality associated with cardiac surgery in recent years morbidity and in particular neurological morbidity remains a significant problem. Visual disturbance is frequently mentioned in reports of neurological sequelae of cardiopulmonary bypass but an exact definition of the causative lesions is never given.

Sixteen patients undergoing cardiopulmonary bypass were subjected to a battery of ophthalmology tests both pre and post operatively. In four cases (25%) marked changes in sensitive visual field tests were found. The field changes demonstrated were identical to those found in patients with glaucoma and would therefore seem to indicate that the causative lesion was being produced by a perfusion problem. The development of visual field defects was not related to the type of surgery performed, two patients having surgery for ischaemic heart disease and two for valvular heart disease and neither was it prevented by the use of hypothermia.

If the field defects are indeed perfusion related then the effect of cardiopulmonary bypass on intraocular pressure is very important as perfusion of the retina and optic nerve fibres will depend on the relationship between intraocular pressure and systemic blood pressure. A review of the literature gave conflicting results and we therefore investigated the effects of cardiopulmonary bypass on intraocular pressure.

Ten patients undergoing coronary artery bypass grafting were studied using a standard anaesthetic and bypass technique. A priming solution with an osmolality of 318 m. osmols per kilogram of water was used. Serial measurements of intraocular pressure, haemodynamic variables and serum osmolality were made. Post induction, as expected, intraocular pressure fell but following the commencement of cardiopulmonary bypass there was a statistically significant increase in the intraocular pressure from a mean of 16.9 to a mean of 27.1 mm. of mercury. At a time when mean systemic blood pressure can be very low this is a highly significant finding.

The cause of this increase in intraocular pressure when so many other factors are acting in the opposite direction is unclear. We would postulate that the likely explanation is that it is due to a sudden reduction in colloid osmotic pressure produced by the use of a pure crystalloid prime. From other work published on this subject we would predict that the fall in colloid osmotic pressure associated with the use of this priming fluid could be in the region of 40%. This would lead to an inflow of fluid into the vitreous, increasing the volume and so producing a detected rise in intra ocular pressure. Whether this is the mechanism behind the changes we have shown and the implications of these changes for other organs, in particular the brain, are matters which will require further investigation.

While most other aspects of treatment in ITU have undergone close scientific scrutiny, sedation has been provided on an empirical basis. In the past patients were sedated to the point of unresponsiveness and detachment from their surroundings. The evidence that this is desirable or necessary over a prolonged period is scant and it has been suggested that this level of sedation is prescribed for the convenience of staff rather than for any proven benefit to the patient. The possibility that Etomidate as a sedative infusion may have increased mortality aroused an increased interest in the problems of sedation. Most ITU's now prescribe drugs to provide a level of sedation at which patients remain rousable to varying degrees. There remains uncertainty, however, about the precise aims of sedation and best means by which it might be achieved especially in long-term ventilated patients.

Sedation should be concerned mainly with psychological comfort. The essentials are relief of pain and anxiety and provision of periods of sleep. After the initial periods of 24-48 hours in ITU these aims are achievable for the majority of patients without requiring the permanent obtundation of consciousness. Patients' memories of ITU indicate that there is a remarkable adaptation to stressful circumstances if explanation and reassurance are provided. This necessity for human contacts and rapport is a constant feature of patients' recollections and should be the foundation of sensible sedation regimens. After the initial admission period when considerable drug therapy will probably be required attempts should be made to reduce depressive agents and achieve a state in which the patient is comfortable, has periods of sleep but will rouse either spontaneously or to command to a state of comprehension. There are, of course, wide variations in individuals' response to the stress of ITU and this ideal will not be achievable for all patients but drug therapy should be individualised

to permit the administration of the minimum amount of depressant drugs to achieve comfort.

Morphine and papaveretum are the most popular agents in use and have the advantage of not only being potent analgesics but also providing mood elevation. The Benzodiazepines, in particular Midazolam have gained considerable popularity in the past few years.

In a study currently under way in the ITU at the Western Infirmary, Glasgow, we have compared the use of Morphine or Midazolam infusions to achieve the above level of sedation in ventilated patients. Morphine appears to be more successful in producing a comfortable rousable patient than Midazolam but both drugs fail to achieve satisfactory sedation in a minority of patients. Many other agents are employed as sedation but none has attained wide popularity. The introduction of the new short acting anaesthetic agent Propofol provides an additional option for future study.

It is unlikely that any one agent will be universally adopted. The enormous variation between patients and also within each patient at varying periods of an illness required flexible drug input. Patients on ventilators in ITU for days or weeks should not remain in a state of anaesthesia unnecessarily and we should learn to use the drugs that are currently available, to provide comfortable awareness rather than unconsciousness. If pain relief can be achieved, e.g. by regional blockade and reassurance is provided it is surprising how many patients will tolerate ventilation with minimal sedation. These patients will not only cooperate and adapt to the circumstances of their illness but will provide a much more humane ambience in the Intensive Therapy Unit and destroy the image of patients being treated like "objects as impersonal as the machines to which they are attached."



WELCOME BREAK FROM BUSINESS

GILLIES MEMORIAL LECTURE—Dr A. H. B. MASSON INTER PARES



Dr Masson receiving the Gillies Memorial vase from Dr Deirdre Gillies

In its prolonged struggle for recognition, the specialty of anaesthesia owes an enormous debt of gratitude to its leading personalities—men such as Buxton and Hewitt, Boyle and Magill. It owes as much to the relatively small band of dedicated doctors who devoted their careers to an unpopular specialty at a time when the financial rewards were poor and status lowly. They improved standards and safety in anaesthesia to the extent that it proved itself worthy of that recognition.

One of that band was John Gillies. In the first Gillies lecture, Sir Gordon Robson described the major part he played on the national and international scene and, in particular, his crucial role as President of the Association of Anaesthetists in the negotiations which preceded the implementation of the National Health Service Act. Less well known are his earlier days in anaesthesia when he developed the qualities recognised by his colleagues when they elected him as their chief representative in the critical negotiations.

The achievement of parity with other specialties, arguably the most important single factor in improving safety, finally came about within the National Health Service but that was but the last in a series of social, economic and political events which, with two world wars, shaped the destiny of our specialty.

A convenient starting point in this story is the 1890s—about the time John Gillies was born. It was then that important changes in surgery and anaesthesia were taking place. You might think that the introduction of anaesthesia and antisepsis would have led to an immediate and dramatic increase in the volume and scope of surgical practice. Not so. The rate of increase was quite slow until the 1890s when the era of abdominal surgery, made possible by Lister and the

great German school of surgery, was just beginning. In anaesthesia, the professional anaesthetist was emerging after nearly half a century which had seen only two of note—Snow and Clover.

The economic background is relevant to my theme. Those were the days which marked the heyday of the British Empire. The country's production resources, enormously expanded by the Industrial Revolution, enabled the privileged few in Britain to achieve an unparalleled standard of living. The Clyde, for example, was the world leader in ship building and heavy engineering. But behind the facade of Imperial pomp and splendour and the background of wealth and optimism, all was not well with the body politic. The revelations of Charles Booth and Seebohm Rowntree on the extent of poverty and deprivation within this apparently rich country came as a rude shock. Thirty per cent of the population were considered to be below the poverty line and the health of the nation became a national issue after the reverse of the Boer War when it was revealed that, despite the reduction in the minimum acceptable height for army recruits, no fewer than two out of every five had been rejected.

It may surprise you to know that one of the most important causes of poverty and debt was the expense of burial, a recurring event which, in large Victorian families, could reduce a widow or a family to penury. Infant mortality was a staggering 154 per 1000 live births. A second major financial anxiety for the poor was the cost of doctor's bills. Many could not afford to pay and, in consequence, did not seek medical advice until it was late and the patient was dying or already dead. Compared to sickness and death, other domestic expenses were almost trivial.

For the doctor too, apart from the few at the top of the profession, life was far from easy. The great Lister had no laboratory, no research assistant and paid his modest research costs out of his own pocket. The majority of medical men derived all of their income from private practice. Top surgeons could command large fees but there was insufficient surgery available in most centres to allow a man to make a living from anaesthesia alone. Even 50 years later, most of Edinburgh's anaesthetists were practising general practitioners or dentists. It was no coincidence then that the first anaesthetists proper should have been in London because only in the metropolis would there have been a sufficient concentration of patients with the means to pay for surgical treatment.

Pre-eminent among the personalities who contributed to the creation and development of our specialty were three men, all working in London, whose contribution would be hard to exaggerate—Frederick Silk, Dudley Buxton and Frederick Hewitt. After years of sterile argument about the relative merits of ether and chloroform, they passionately advocated the belief that anaesthesia was the job for the expert whose knowledge and skill were far more important than the drugs he used or the methods of administration he employed. They created the conditions necessary for the development of the specialty and gave cohesion to a widening group of practitioners interested in anaesthesia. They all wrote textbooks and those written by Buxton and Hewitt were seminal—the first major works on anaesthesia for the student. Both books were deservedly popular and influential and went through many editions.

Frederick Silk in 1893 founded the Society of Anaesthetists—the first anaesthetic society in the world—which provided a focus and a meeting point for people with a special interest in the subject. The declared objects of the Society were admirably simple and to the point. They were (1) to encourage the study of anaesthetics and (2) to promote and encourage friendly relations among the members by debates, discussions or the reading of short papers. Its original forty members came mainly from London but there were two from Manchester, one from Liverpool and two from Scotland—Cullen from the Edinburgh Dental Hospital and Thomas Brown Henderson from the Dental Hospital and Ear Hospital, Glasgow. By 1908 the membership had grown to 100 and included four from Edinburgh and three from Glasgow. In that year, it became the Section of Anaesthetics of the RSM as a result of a move to unite under that banner all the medical societies of London.

Silk was the first person to propose that anaesthesia be made a necessary part of the medical curriculum. The theme of improving undergraduate tuition, particularly important as it then was since every general practitioner was likely to be called upon to give an anaesthetic, was thereafter iterated and

reiterated. In 1901 when Silk was President, Buxton presented a paper to the Society on 'The Advisability of Inclusion of the Study of Anaesthesia as a Compulsory Subject in the Medical Curriculum.' As a result of the discussion which followed this paper, the Society approached the GMC on the matter but got a rather frosty reply: 'The Committee fully appreciate the importance of proper teaching on the subject of anaesthetics but they are of opinion that it is not expedient that it should be compulsorily included as a separate subject of the medical curriculum.' Nothing daunted, the campaign organisers pursued the matter to Parliament itself when evidence to the Home Office Committee of Enquiry into the Question of Deaths resulting from the Administration of Anaesthetics, together with the introduction of the Anaesthetics Bill to the Commons in 1909 (with which Hewitt was deeply involved) forced a reluctant GMC into belated action. It appointed a Committee to consider the proposals for legislation which 'had been or might hereafter be put forward' and its Education Committee introduced requirement that instruction had to be given to all students. The successful conclusion to this campaign was the culmination of eighteen years of dogged persistence, lobbying and persuasion.

The political debate about poverty and the health of the nation which started after the Boer War led, after a Liberal administration came to power, to the introduction of the National Health Insurance Act in 1911. This radical measure provided much need relief for some but by no means all of the working population from the crushing cost of medical bills. Its intention, in fact, was not to insure the population against ill health but rather to insure the less affluent against poverty and pauperism. The scheme did not originally include the treatment of illness and housewives were not covered. Despite violent opposition, particularly from the medical profession who feared the loss of lucrative fee paying patients, the Act was passed. It became a GP's charter. Doctors, especially in poorer areas, saw their income increased and prestige enhanced. However, since no provision was made for ameliorating the cost of hospital or specialist services, the Act did nothing to improve the lot of surgeons or anaesthetists. Facilities for operations were available only to the rich or to those who qualified for treatment in teaching or voluntary hospitals.

Despite this, the number of anaesthetists began to increase, albeit slowly. In Glasgow and Edinburgh, the first were dental anaesthetists but two were appointed to hospitals in Edinburgh in 1901 and Fairlie was appointed to Glasgow Royal Infirmary in 1910. One of the two in Edinburgh was T. D. Luke who was appointed to the Royal on condition that he did not actually give anaesthetics or, as the Board minute quaintly put it 'in no way would he interfere with the patients.' By 1914 there were fourteen practitioners in Scotland who banded together to form the second

anaesthetic society in the UK—the Scottish Society of Anaesthetists. There were five from Edinburgh including Torrance Thomson, J. S. Ross and J. H. Gibbs, five from Glasgow including Fairlie and Home Henderson (son of the Henderson who was a founder member of the Society of Anaesthetists), three from Aberdeen including Ogston, and Mills from Dundee. Considering the state of the art, it was a goodly number of quite talented individuals.

The war, of course, considerably influenced the course of the emerging specialty but it is perhaps surprising that the effect was not greater when one considers the enormous number of casualties over the few bitter years of conflict. At the outset, only chloroform was supplied to the army though ether was soon made available and used extensively in Shipway's warm ether apparatus. Anaesthetics were administered by any medical officer. There were no specialist anaesthetists. It was very soon appreciated that the seriously injured man, prostrate by shock and sepsis, withstood anaesthesia very poorly. Chloroform and spinal anaesthesia were noted to be particularly lethal. It was not until 1916 that specialist anaesthetists were first appointed as additional officers on the staffs of the casualty clearing stations. In 1918 they were supplemented by over 200 nursing sisters who had been specially trained the previous year. Torrance Thomson and Ross from Edinburgh were among those who served from 1916—Thomson in France and Ross in Salonika.

The use of nitrous oxide with oxygen had been pioneered by Hewitt but his apparatus with its large rubber bags was clumsy and it was the Americans who produced the first practical machine for gas and oxygen anaesthesia. One of the earliest was that of the American pioneer, James Tayloe Gwathmey, who met H. E. G. Boyle at a meeting in America in 1912. Their acquaintanceship was renewed in 1917 when both were serving in France. Boyle was persuaded to try Gwathmey's machine and he got Messrs Coxeter to make a copy. He presented this, the Original Boyle (which he described as a 'N20/02 ether outfit') at a meeting of the RSM. Boyle's machine, however, had two cylinders of nitrous oxide and two of oxygen, each with a fine adjustment valve and tap. It also had a spirit lamp for warming the reducing valves of the nitrous oxide cylinders which tended to freeze, a problem which was solved eventually by drying the gas at the time of manufacture. Boyle's machine was an immediate success and the army ordered a large number which were sent to C.C.S. in France. Another anaesthetist who served in France was Langton Hower who later wrote: 'After I qualified and received a commission, I was fortunate enough to be attached to a unit whose anaesthetist was Torrance Thomson and he brought with him his own Gwathmey apparatus which he used with great skill.' The numerous contacts between British and American anaesthetists helped to give impetus and cohesion to the specialty.

The war also extended the scope of surgery and this had an important effect on anaesthesia. The limitations of conventional methods were exposed and answers had to be found to new problems. At first, the surgery of chest wounds was restricted to the resection of a part of a rib or the drainage of an empyema but later the pleural cavity was explored and lung wounds treated. Early specialisation of the surgery of head and orthopaedic injuries began as did faciomaxillary surgery. Faciomaxillary injuries were a particular problem even for the experienced anaesthetist. Boyle recorded that he at first used rectal ether/oil and then paraldehyde and ether per rectum. It was Ivan Magill who began to provide the answer to the difficulty of securing an airway. He served with the RAMC and in 1919 went to the Queen's Hospital for Faciomaxillary Injuries at Sidcup where, together with Edgar Stanley Rowbotham, he set in train a series of innovative techniques which brought anaesthesia into the present era. Soon dissatisfied with the lack of a secure airway and the unpredictable conditions, Magill turned to endotracheal insufflation which had been pioneered in the US, first used in Britain by Kelly in Liverpool and introduced to London by Shipway. Magill first described his special forceps to assist the introduction of the narrow bore gum elastic catheter into the trachea. The wide bore tube, the laryngoscope with the battery incorporated in the handle and blind nasal intubation followed and, later, when he went to the Brompton Hospital, he tackled a whole new range of problems, using an inflatable cuff to control secretions during a lobectomy in 1931, one lung anaesthesia in 1936 and rotameters. Few people have had more influence on the development of the specialty than he.

Another wartime anaesthetist of note was the American, Arthur Guedel. His famous signs of ether anaesthesia, first published in 1920, were the fruits of his experience in military hospitals in France. So, although the war itself had a smaller effect on anaesthesia than might have been imagined, these three men, Boyle, Magill and Guedel, as a direct result of their military experiences, had a considerable impact on the future of anaesthesia; and the vast experience gained by many did improve standards generally. In the words of the official historian: 'The art of administering anaesthetics was greatly developed during the war with immense benefit to both patient and surgeon. The increased supply of special apparatus contributed greatly to this result and the administration of warm ether vapour and of N20/02 instead of chloroform saved very many lives. But he also noted of nitrous oxide and oxygen that 'while safe in skilled hands, it was decidedly dangerous if the right methods of administration had not been thoroughly learned.'

John Gillies went to Edinburgh University in the autumn of 1913. At that time, he would have had no contact with anaesthesia since, as a first year medical student, he studied mathematics and natural philosophy. When the war broke out in August 1914, he joined

the army and served with distinction until the end of the war. He was commissioned in the Highland Light Infantry and was awarded the Military Cross for conspicuous gallantry. He spent the last seven months of the war as a prisoner of war. After the war, he returned to Edinburgh and resumed his interrupted studies. For the majority of students then, instruction in anaesthesia was as inadequate as it had ever been. In 1922, the twelve London teaching hospitals employed 27 specialist anaesthetists and almost all medical schools had one or more visiting anaesthetists on the staff. In Scotland there were none. There were four honorary anaesthetists for the seven surgical charges in Edinburgh Royal Infirmary—Torrance Thomson, Ross, 'Daddy' Jones and Freddie Gibbs and after Ross left, David Middleton became the fourth in 1925; but they had no official standing and were not recognised as members of staff. Each student was supposed to attend a course of six lectures and give six anaesthetics but, with 340 students in the year, that was a virtual impossibility. Those who, like John Gillies, were taken on as Juniors, however, or assistants to the House Surgeon, had some apprenticeship in the subject, often giving between 50 and 100 anaesthetics.

An important landmark was the founding of two journals devoted to anaesthesia—*Current Researches* in the United States in 1922 and in 1923 the *British Journal of Anaesthesia* which from the start had a considerable international input. The regular reader would have been familiar with the names of the most distinguished North American anaesthetists as well as regular English contributors such as Wilson, Blomfield, McCardle and Langton Hewer and Scottish ones such as Fairlie, Ross McKenzie and Ross. An editorial in the *BJA* stressed the necessity for organisation and examinations—'to attempt to exert an influence commensurate with our numbers, except as a united entity, would more than likely meet with failure.' An early issue contains an article by Langton Hewer on the results of 1000 cases of endotracheal anaesthesia which included 250 thyroidectomies (a huge number by any standard) while Boyle, working with Langton Hewer, wrote on 'How to obtain proper relaxation.' He used endotracheal insufflation with ether and stated—this in 1923—'breathing can be entirely suspended but this is only necessary in a small proportion of cases.'

One of the most significant features of the inter war years was the establishment of various departments of anaesthesia in teaching centres in the U.S. under Lundy at Rochester, Waters at Madison, Rovenstein at New York; in Canada under Wesley Boume at Montreal and belatedly the first in Britain at Oxford under Mackintosh. The contributions which they made were considerable but none had a greater impact than that of Waters. He and Guedel introduced the technique of CO₂ absorption and controlled respiration, introduced cyclopropane and cuffed endotracheal tubes and he was the first to use thiopentone—major developments which, with the work of Magill and

Boyle paved the way for modern anaesthesia and were the essential preliminaries to the successful introduction of curare.

In the 1920s, the voluntary hospitals were in deep and increasing financial trouble. They depended entirely on legacies and donations for their income but, in the aftermath of the war, heavy taxation, high prices and unemployment reduced available finance. Expenditure rose inexorably despite being tightly controlled. The deficit, however, rose year by year. In RIE, it rose from £25000 in 1914 to £32000 in 1918 and £50000 in 1937. But bad though the financial position of the voluntary hospitals was in Scotland, it was even worse in England. In 1920, many London hospitals faced the prospects of closure and were only rescued by a new insurance scheme for those with modest incomes, while St Thomas's and Guy's avoided the crisis by the expedient of admitting fee paying patients which led directly to the establishment of private wings and paybeds.

The doctors who worked there were unpaid except perhaps for a token honorarium. Trainee surgeons and physicians were usually men of private means and the residents likewise were unpaid. Senior men established their reputations there and made their income in private work. In private, the surgeon might charge 100 to 400 guineas a case but he gave his anaesthetist 1 to 3 guineas—and even that was reduced (by the surgeon) if he restricted his fee because of the patient's circumstances. The anaesthetist did not charge the patient directly and he was totally dependent on the good will of the surgeon for his livelihood.

The position of the anaesthetist was invidious. Miserably paid and dependent on the surgeon in private, he could ill afford to give his time and services for nothing in the voluntary hospitals. But the hospitals could not afford to pay for anaesthetists. When the surgeons in Edinburgh Royal Infirmary requested the appointment of an anaesthetist, the board of Management replied that it 'raised a very important and far reaching question' and that 'should the suggestion of the staff be carried out, it would in all probability involve the institution in expense in the shape of salaries.'

The deficiencies of the National Insurance Act created increasing problems. There was no provision to pay for obstetric services or for hospital treatment. In 1928, there were 2920 maternal deaths in England and Wales (50 years later there were 76). The gulf between those who could pay and those who could not was stated bluntly by an obstetrician at a joint meeting of obstetricians and anaesthetists at the RSM that year. He said that there were three types of confinement—first, the poor and in hospital where an anaesthetic was not usually given. Second, the wealthy who employed an obstetrician and an anaesthetist and thirdly, in a doctor's practice where the practitioner gave the anaesthetic and conducted the labour. Two years later, a letter in the *BMJ*

signed by Mrs Baldwin and Lady Dawson of Penn appealed for money to provide an anaesthetist at Queen Charlotte's Hospital for those who could not afford it. 'The mother who can afford it pays a fee to the anaesthetist. The mother who cannot has to pay a fuller penalty of suffering.'

Surgical practice was little different. There, the three groups were first, the poor or 'destitute sick' for whom the parish councils provided poor law hospitals in which the standards were Dickensian and deplorable. At the other end of the scale were the private patients who were operated upon in their own homes or, increasingly, in nursing homes, most of which were quite small. Their numbers reached a peak in the 1930s when there were 47 in Glasgow, 27 in Edinburgh and 8 in Dundee. Insurance against medical costs was rare and bills were considerable so that the number of those who could afford private treatment was not large. Thirdly, there were the voluntary hospitals for those not poor enough to qualify for poor law hospitals nor wealthy enough to pay private fees.

A partial answer to the problem was provided by the passing of the Poor Law Reform Act in 1929 which discontinued parish councils and transferred poor houses and poor law hospitals to counties and larger burghs and empowered authorities to upgrade poor law hospitals and make them available to the general public as part of the local authority's public health provision. In Edinburgh, the former parish council institutions transferred to Edinburgh Town Council were Craigleith, Seafield and Pilton which became the Western, Eastern and Northern General Hospitals with 900 beds and, a scheme of renovation and improvement was begun to equip and staff them as fully efficient teaching hospitals.

While this helped to reduce the waiting lists and provided more facilities for the students, it did not appreciably improve the lot of the Edinburgh anaesthetists. Although surgeons and physicians were appointed and paid, anaesthetics were given, as in the voluntary hospitals, by the unpaid students even though in the Western General Hospital 901 operations were carried out in 1935 of which 550 were classified as major. The first anaesthetic appointment to the Western was not made until 1939 when Frank Holmes, then recently qualified, was appointed as resident anaesthetist with a salary of £150 per annum. For holidays, he had to find and to pay for his own locum.

But south of the border, the lot of the anaesthetist was improved for anaesthetic sessions were provided and the anaesthetist paid by many of the local authorities. Improvement though this was, it highlighted two problems. First, they had no representative body, other than the BMA to negotiate the level of fees; and second, there were no standards laid down, nothing to distinguish the trained anaesthetist from what Featherstone, the first President of the Association of Anaesthetists, described as 'the unskilled but optimistic

novice.' The Anaesthetic Section of the RSM recognised the problems but was powerless to help since its Constitution restricted its activities to scientific matters. But, in 1932, a group of its members met and set up the Association with a membership restricted to 150. A Council and Office Bearers were elected and representatives invited from Glasgow (Fairlie), Edinburgh (Torrance Thomson), Aberdeen (Ross Mackenzie) as well as Cardiff, Dublin and the English provincial cities. Early topics taken up by the Association included the question of fees paid by the LCC and the appointment of a sub committee to set up a D.A. This was rapidly agreed and the first examination was held in 1935.

It was in 1932 that John Gillies decided to leave general practice in Yorkshire. He first went at his own expense to London where he came under the spell of men like Magill before going to Edinburgh where, with a wife and family to support, his only guaranteed income at first was £50 per year from the Sick Children's Hospital. Looked at objectively, it was a courageous if not foolhardy decision for not only was anaesthesia not recognised in Edinburgh but times were hard everywhere because of the great depression. Anaesthesia was still a rather despised and a very poorly paid specialty. There was little money to spare for the private fees which were necessary for survival. It is not surprising then that, of the four anaesthetic supervisors in Edinburgh Royal Infirmary, only two were in full time practice (both in the professorial units). The other two were practising dentists as well as anaesthetists—hardly an auspicious place, one would think, for a man of ambition to come to.

In 1931, the surgical staff of the Royal Infirmary had submitted a letter to the Board requesting the appointment of two resident anaesthetists for emergency work. It was suggested that two nurses might be trained but the Board finally agreed to appoint one anaesthetist with an honorarium of £200 per year. In considering what was behind this request, it may, or may not be significant that, about this time, the hospital received a letter from the Crown Office about the danger of allowing unqualified medical students to give anaesthetics without supervision. 'It appears' the letter said 'from a case which has recently come under consideration that the supervision may on occasion be merely nominal.' An insight into the standards of the times can be obtained from a letter from the Superintendent to the surgeons and anaesthetists on deaths between 1921 and 1932. It seems to me somewhat self congratulatory for it showed that the death rate was one per thousand operations and had not changed over the years. By mid 1933, the work (and honorarium) was shared by three people, one of whom was John Gillies. It was a chore he was to perform for several years.

An important stroke of luck came in 1934 when, on the resignation of Torrance Thomson, John Gillies was appointed to the wards of Professor (Sir) John Fraser though he was required to give up some of his other

commitments. (It was characteristic of the man that, despite this appointment, his was one of the names on the pass list on the first D.A. examination the following year). The effect of his arrival can be seen in the anaesthetic book. Prior to that time, records were kept somewhat erratically and the techniques were limited to ethyl chloride/ether or chloroform/ether. From the day John Gillies started, the book is kept in meticulous detail with his name opposite at least one, the major, case and the student, clearly under good supervision doing the others. The techniques are much more varied—the first endotracheal N20/O2 in the Infirmary, spinals and intravenous agents. It is also noteworthy that the names of some students appear quite frequently—people like Arthur Bolster, Jim Straton and Douglas Shannon who subsequently made the specialty their career. The ability to inspire students to follow in one's footsteps is surely one of the hallmarks of the good teacher.

Even more significant was his impact on the organisation of anaesthetic administration and teaching. Over the years, the surgeons had, on several occasions, strongly resisted the idea of any anaesthetist being appointed to the staff of the Royal but in 1938, only five years after his first appointment to the hospital, the Honorary Staff Committee set up a sub-committee consisting of two surgeons and three anaesthetists—John Gillies, David Middleton and Bennie Wevill—and they recommended, among other things, that the anaesthetist to each surgical charge should be recognised as a lecturer by the University and, very significantly, that the anaesthetists should be represented on the Honorary Staff and be invited to nominate two of their number as representatives, that there should be an anaesthetist for each surgical charge and that, for the administration of anaesthetics on waiting days, two full time anaesthetists should be appointed. The proposals which involved the University were not implemented immediately because of the war but all the others were and Wheeler and Leslie Morrison, and later Alastair McKinley, were appointed in 1940 and 1941—the original Department of Anaesthetics in the RIE. In such a short time, John Gillies had stamped his authority on the Infirmary by improving undergraduate tuition and the status of the anaesthetists on the staff and creating the first Department of Anaesthetics in Scotland—one of the first in Britain.

Although the Poor Law Reform Act had little impact on Scottish anaesthesia, the advent of the Second World War has a considerable effect. In preparation for war, the EMS was set up in June 1938 to put hospitals on a war footing and to prepare for aerial bombardment. The idea was that heavily populated areas would have casualty clearing hospitals while fully equipped base hospitals would be set up in rural areas. In Scotland, Law, Ballochmyle, Killearn, Bangour, Peel, Bridge of Earn, Stracathro and Raigmore were built and, to deal with the anticipated war injuries, specialist units were organised for the treatment of fractures, burns, head injuries and hand

injuries. Hitherto, specialism, even in surgery, had always been resisted by Scottish surgeons but now anaesthesia, radiology and pathology were encouraged in these state-run EMS hospitals. In the event, they were largely unused until Scotland's greatest Secretary of State, Tom Johnston, offered their services to civilians involved in the war effort and then to all in order to reduce hospital waiting lists. In all, 40,000 civilians were treated during the war years and, by the end of the war, the extra beds had become indispensable and were not given up. In England, there were no such state hospitals.

It is said that the army traditionally is prepared to fight the previous war. The truth of this can be judged from an article in the Journal of the RAMC describing experiences with the BEF in France in 1940. The apparatus in the General Hospital was 'a field pattern Boyle, a Shipway's warm ether apparatus (of which the writer states 'the Shipway was not much used in spite of its popularity in the last war') a Junkers bottle, a Bellamy Gardner ether dropper, a Schimmelbusch mask and (a concession to change since 1918) Magill tubes and laryngoscopes.' The writer concluded 'surgeons are very conservative preferring the well tried methods of anaesthesia. As one very senior surgeon put it to me when discussing this point "My dear fellow, once you encourage that sort of thing, the anaesthetist begins to think he's more important than the surgeon".' The Official Medical History states: 'Little attention was paid to anaesthesia in the army between the wars so, in 1939, it was ill equipped in skilled personnel and apparatus. Anaesthesia was under the control of the Consulting Surgeon and only five regular officers had the DA. Of these, only two were employed in the specialty at the outset of war and even these were transferred to administrative posts after a few months.' The problem was solved to some extent by the absorption of civilian anaesthetists.

Nevertheless, it was in the armed forces—the army in particular—that crucial changes occurred so far as anaesthesia was concerned. In February 1941 an Adviser in Anaesthetics was appointed to the War Office, a post later upgraded to Consultant. This brought about much needed improvement for, by touring various Commands, first in U.K. and then abroad, he was able to contact and assess the capabilities of various anaesthetists and to discover shortages and faults in apparatus and equipment. Training courses were started and advisers appointed to the overseas Commands so that, by the end of the war, anaesthesia was at a high state of efficiency. Modern equipment was gradually substituted and war surgery gained immeasurably. An important effect of war service for the anaesthetist was the experience he obtained in preoperative assessment and resuscitation, experience which hitherto had been the province of the surgeon. As Professor Douglas put it 'he entered the war as a purveyor of sleep but ended it as a skilled physician of trauma.' More important, it was officially recognised that the

administration of anaesthetics was a highly skilled occupation and that anaesthetists were indeed specialists—the ultimate vindication of Silk, Buxton and Hewitt. Specialists or graded anaesthetists were appointed and all military medical units which carried a surgeon had either an anaesthetist of some experience or one who had had a course of training under a specialist in one of the larger hospitals and most were experienced in faciomaxillary and thoracic surgery. The pattern was similar in the Navy and the RAF though the army had taken most of the civilian anaesthetists.

Finally, by far the most significant contribution of the Service was the fact that officers were paid according to their rank and irrespective of specialty so that a major who was an anaesthetist was paid the same as his surgeon of equal rank. Thus the first official and full recognition was achieved in the services in wartime and after the war so many well trained anaesthetists were returned to civilian life that they could never have tolerated and conditions of pre-war days. Parity had been attained.

It has been noted that the greatest constraint upon good anaesthesia in pre-war days was financial. The voluntary hospitals could not pay for an anaesthetic service but the EMS, the local authority hospitals and the services had set the pattern; and the government of whatever party was committed to change. On October 9, 1941, in the darkest days of the war, the Minister of Health stated that the Government's intention was the 'by means of a comprehensive hospital service, appropriate treatment shall be readily available to every person in need of it'—a policy endorsed on 16th February 1943 when it was stated: 'The object is to secure that every man, woman and child who wants it can obtain easily and readily the whole range of medical advice and attention' and this was formally avowed on behalf of the coalition government. The White Paper on 'A National Health Service' was presented in February 1944.

Meanwhile, in Edinburgh, Sir John Fraser became Principal of the University and he was succeeded in the Chair of Clinical Surgery by James Learmonth who became another powerful supporter of John Gillies. In 1944, the Medical Management Committee of the Infirmary considered a memorandum which contained proposals for the creation of a post of

Senior Anaesthetist who would organise an anaesthetic service, act as Chairman of the staff of anaesthetists and organise investigations in relation to anaesthesia. The principle was agreed but, since some potential candidates were away on war service, consideration of a candidate was deferred until after the end of the war. On July 8, 1946, John Gillies was invited by a delegation representing the Infirmary and the University to accept an appointment as Director of Anaesthesia to the Royal and Lecturer (later Simpson Reader) in Anaesthesia to the University. The University had two previous lecturers—Luke and Ross—but the post had been in abeyance since 1926. One of Ross's legacies was a Handbook of Anaesthetics, first published in 1919, which had gone through several editions with first Fairlie and then Minnitt as co-authors. Now, in the 1940s, it was completely rewritten by John Gillies and brought out as Minnitt and Gillies' Textbook of Anaesthetics in 1944 which, in its day, was the standard textbook on the subject. In 1943, Gillies was elected to the Council of the Association and within four years had become its President. The importance of that office was incalculable at the time of the run up to the introduction of the National Health Service and Gillies' great contribution to the national and international scene has already been recorded. He was clearly the right man in the right place at the right time.

The advances he achieved in Edinburgh were enormous. He consolidated his own position by his own high standards and skill. He reorganised the teaching of clinical anaesthesia. He improved the service within the hospital out of all recognition and he fought for and obtained enhancement of the status of the anaesthetist—all this in a city traditionally hostile to anaesthetists. He achieved all this, not by confrontation or aggression but by gentle charm, utter integrity, good humour, a warm personality and a profound conviction of the importance of 'the integration of training in basic sciences, clinical medicine and surgery with the theory and practice of anaesthetic administration and its important ancillary, patient care.' These were the same attributes which his colleagues on the Council of the Association of Anaesthetists recognised when they made him their President. As for me, it was a great pleasure to work in his happy department and a privilege to have been allowed this opportunity of paying a small tribute to his memory.

EDINBURGH AND SOUTH EAST REGION

In North Edinburgh the main developments have been on the Western General Hospital where the new Intensive Care Unit is hopefully to open this summer if and when two new consultant posts are approved. Leith Hospital continues to "wind down" with regard to acute services. The Neurological Unit now boasts an upgraded intensive care facility for acute head injuries run by Dr Mark Deardon and his colleagues which has been very busy lately. Dr Bruce has left the area to take up a post in Elgin—we wish him well. In South Edinburgh several new staff changes have taken place to man a new theatre at Princess Margaret Rose Orthopaedic Hospital and to replace Dr Jack Burgoyne who retired last year. Sessions there and in the City Hospital have been covered by Dr Geoff Bowler, Dr Dermot McKeown (recently returned from Adelaide) and Dr Mike Logan, all of whom are to be congratulated on their new consultant posts. In the Sick Children's Hospital Dr David Simpson, erstwhile SR in the Royal Infirmary, has been promoted to Consultant.

In the Royal Infirmary the Academic Department has seen a few changes. Dr Mike Logan (now Consultant) and Dr Iain Levack (for Consultant post in Aberdeen) have both left and been replaced by Dr Ian Power (Glasgow) and Dr David Noble (Aberdeen) who are the new Lecturers.

Among the RIE Consultants Dr I. Davidson is now our new Chairman of Division, Dr Willie MacRae is to be congratulated on becoming Vice President of the Scottish Society and Tony Wildsmith has joined the Council of the Association of Anaesthetists.

Unfortunately illness has taken its toll and Dr Barbara Leeming and Dr Jimmy Wilson have both had prolonged periods of absence—we wish them both a speedy recovery.

The junior establishment seems to change with enormous rapidity. Dr Bill McCulloch has had a busy year returning from Oman for a few months before obtaining a Consultant post in Coventry. Dr Gordon Pugh is now an SR. Two Research Fellows this year are Dr David Ray and Dr Derek Paul. There has been a mass exodus "abroad": Donald Galloway and Simon Rowbottom to Hong Kong, Andy Spence to New Zealand, Alan Conn to Oman and a take-over bid is being made for Leicester by Mike Jones, Rob Mitchell, Boyd Meiklejohn and Mark Moores all of whom now have posts there.

On the social side two bastions of bachelorhood have fallen by the wayside with John Duggan and Gordon Stewart having married this year, fortunately not to each other, and the lady members have been very productive with babies born to Christine Robison, Linda Rutledge and Fiona Annan. Best wishes to all concerned. The Department now looks forward to the Christmas party although the carpet has only just recovered from the last one!

WESTERN REGION

The Royal Infirmary, Glasgow University Department

Congratulations go to Professor Donald Campbell who was elected Dean of the Faculty of Medicine at the University of Glasgow from January 1987. During Professor Campbell's term of office Dr W. Fitch will be Acting head of Department. Dr J. W. Burns was appointed Research Fellow in September 1986. Dr A. J. Pollock left his post as Research Fellow in the University Department of Anaesthesia to take up a Senior Registrar post in Anaesthesia at the Royal Surrey Hospital, Guildford, Surrey in September 1986. Dr N. B. A. Hodsman left her post as Research Fellow in the Department to take up a combined Senior Registrar/Lecturer post in the Division of Anaesthesia at the Royal Infirmary.

N.H.S Department

Dr R. J. Glavin was appointed Senior Registrar in March 1986. Dr A. S. Blyth joined the Division of Anaesthesia from Stobhill Hospital as a Senior Registrar in January 1987.

The Western Infirmary, Glasgow

Dr T. Algie was appointed Consultant in the Western Infirmary in July 1987. Dr M. Allan was appointed Senior Registrar in Manchester in June 1986. Dr I. Power was appointed Lecturer in the University Department of Anaesthesia in Edinburgh Royal Infirmary in July 1986. Dr A. Colquhoun was appointed Senior Registrar to Leicester in November 1986. Dr A. Norton and Dr M. McNeill were appointed Senior Registrars to the Greater Glasgow Health Board in December 1986. Dr D. Coventry was appointed Senior Registrar in the Department in December 1986.

The Victoria Infirmary

Dr R. Freeman was appointed Consultant Anaesthetist in Carlisle from January 1987.

Vale of Leven

Dr R. McKinlay resigned last summer to take up a post in Guernsey.

The Royal Alexandra Hospital, Paisley

No staff changes but a palatial new hospital was opened in late 1986. Purists note the change of name from the R.A.I. to the R.A.H.

Ayrshire

Retiral—Dr Lawrie-Smith

Resignation—Dr C. Thomas.

New Consultant appointments—Dr P. Wilson and Dr P. J. Hildebrand from June 1986.

Other new Senior Registrar appointments to Glasgow from December 1986 are Dr Howie from Edinburgh and Dr E. McGrady from York.

Forth Valley

In Falkirk a new maternity unit is at the commissioning stage, possibly now open by the time you read this article. In Stirling a new surgical unit, wards and theatre is at the building stage and hopes to open in 1988. There have been no consultant anaesthetic staff changes in the last year in Forth Valley.

Lanarkshire

At Monklands Dr W. S. Dykes has retired and has been replaced by Dr S. McVicar. At Hairmyres, Dr J. Richards has been replaced by a twin appointment of Dr J. C. Lees and Dr A. E. Robertson sharing the Consultant sessions. At Law Hospital Dr G. G. Rennie who has retired has been replaced by Dr J. Martin. Dr W. E. Elsdon fills a new post and Dr J. Prentice has filled the post vacated by Dr A. I. McKenzie. Dr McKenzie retired on 1st December 1986 and is, of course, the current President of the Scottish Society of Anaesthetists. On the building front in Lanarkshire there is an extension to the Accident and Emergency Department at Monklands. Further developments of surgical and theatre facilities at Hairmyres are planned and a new maternity unit for Law Hospital is still under discussion.

Dumfries and Galloway

Dr R. Spicer has been appointed as a five session part time Consultant Anaesthetist to Stranraer Hospital.

TAYSIDE

Nineteen eighty six has been an eventful year for anaesthesia in Tayside in a number of respects. Dundee was host in March to the Obstetric Anaesthetists' Association. This was a very successful and well attended meeting, thanks to the efforts of the organisers, led by Drs Ian Lawson and Mel Milne. June saw the Annual Registrars' Meeting of this Society which was attended by over 40 junior anaesthetists from all over Scotland. Also in June Dr Bill Macrae organised a residential meeting on terminal care under the auspices of the North British Pain Association which was held in St Andrews and was an outstanding success.

September saw the official opening of the new Plastic Surgery and Burns Unit at Dundee Royal Infirmary. This has meant the complete transfer of Plastic and burn surgery from Perth and another step towards the eventual closure of Bridge of Earn Hospital. We were delighted that Dr Neil Mackenzie, one of our Senior Registrars, was promoted to Consultant with an interest in anaesthesia for plastic and burn surgery.

In Perth Dr Calum Davie retired from his post as Consultant Anaesthetist. We wish him a long and happy retirement. He has been replaced temporarily by Dr El.-Katsha until a new Consultant is successfully appointed.

We have seen promotion of three of our Senior Registrars, John Martin, who becomes Consultant in Law Hospital, Neil Mackenzie who stays in Dundee and Marjory MacNab who moves to Aberdeen, and we give all three our congratulations and best wishes.

Dr Alan Semple has been to Seattle, gaining further experience in pain management, while Drs Morton and MacNab have been in Canada. Our Senior registrar ranks have been replenished by Drs Grant Hutchison and Rae Webster who we were delighted to congratulate for winning the Society's Registrar Prize this year.

Success for Drs David, Lonsdale, Nik and Wee in the final F.F.A. examination was particularly gratifying in view of the current low pass rates both in London and Dublin.

Promoted to Registrar from S.H.O. positions during this year were Drs Cathy Davies, Gillian Hood and Michael Serpell while Drs Sally Crofts and Fergus Millar joined us as S.H.O.'s.

The day to day running of the Department continued smoothly thanks to the efficiency of our secretary, Mrs Dorothy Morrison.

Finally, at the end of 1986 we are looking forward to the return in the new year of our Chairman, Iain Gray, who is making an excellent recovery from his extensive surgery during the year.

GRAMPIAN REGION

Dr Lawson Davidson, a Past President of the Society, retired in June having practised anaesthesia in Aberdeen since 1948. We miss him in the department but all hope that he will have a long and happy retirement. Dr John Latham whose decision to retire was noted last year has also left but to compensate, as it were, for the loss of these two stalwarts we have seen several new consultants appointed; Dr Judith Blaiklock in May, Dr John MacKenzie in July, Dr Iain Levack in August and Drs Marjory Macnab and Harry McFarlane in November. In Elgin Dr Joan Whelan retired in May and was replaced by Alex Bruce (may his anchor hold).

As new Senior Registrars we welcomed Drs Janet Braidwood and Pradeep Ramayya in July and Dr Alastair MacNeil in September. John Muir left in June for a consultant appointment in Halifax (Nova Scotia).

We saw many changes in the Registrar ranks with the appointments of Drs Bill Morrison, Mike Brockway, Philip Braithwaite, Colin Rodgers, Raqul Kaldas, Gordon Byers, Elizabeth Smith and Wendy Dollery. Dr Donald MacLeod departed in May to a lectureship in The London Hospital and Dr David Noble to a lectureship in Edinburgh. Dr Alison Campbell is spending a year on attachment to a paediatric unit in Nova Scotia and Dr Anthea Wright resigned in September on her husband's appointment to a post in Lincolnshire.

New S.H.O.'s starting in August were Drs Alison Symon, Kate Dewar and Andrew Hay.

Finally Dr Andrew Norton was appointed to a lectureship in anaesthesia, the first incumbent of this new post, in December and we look forward to welcoming him in the new year.

HIGHLAND REGION

Inverness

Dr Prasad returned to India in the summer and Dr A. MacNeil moved to Aberdeen to take up a Senior Registrar post. Their replacements were Dr M. Sathanathan and Dr P. Martin from Manchester.

Wick and Thurso

A new central hospital has opened in Wick which should improve the life style of Dr W. R. A. Antonios who previously had to serve 2 hospitals 20 miles apart. There is now a newly arrived second consultant surgeon but a second consultant anaesthetist has yet to be appointed.

Dr Maria Cafferty has returned to Brazil.

Fort William

The Belford Hospital has now joined others in the Highlands in having a full-time consultant anaesthetist. Dr J. MacKay commenced there in September. It is hoped to see an expansion of anaesthetic services there.

GOLF OUTING

This year's golf outing took place at Lanark Golf Club on Tuesday, 10th June. It was organised by Dr Tom Fraser, himself a member of Lanark Golf Club and he is to be congratulated for his superb organisation and the excellent club house facilities and catering. The one thing that nobody can organise in Scotland is the weather and unfortunately torrential rain made play almost impossible and in fact the course was closed after the Society's intrepid golfers had teed off. Of the 22 members who had planned to attend, only 13 arrived on the day. Ten members set off in the driving rain and seven members completed the round. History does not relate what happened to the other three!

Our President, Dr Alastair MacKenzie has donated a new golf Trophy which he called the Scott Trophy in honour of Dr Bruce Scott who was responsible for the start of the Society's golf outing. The President presented this to Sandy Buchan who won the individual Stableford competition for the second year running. Farquhar Hamilton and Bill McCulloch were second and third respectively. Despite the poor weather conditions, our golfing members had a most enjoyable day and look forward to next year's outing which is at Scotsraig Golf Club.



**NORTH EAST OF SCOTLAND
SOCIETY OF ANAESTHETISTS**

Meetings are to be held at 7.30 for 8 p.m. in the Post Graduate Medical Centre, Stracathro Hospital, Brechin, unless otherwise notified.

1986

Thursday, 2nd October, Stracathro

Dr J. Watkins

"Immunology and Anaesthesia"

Thursday, 27th November, Stracathro

Mr D. Walker

Recent Advances in Paediatric Cardiac Surgery

1987

Thursday, 12th March, Stracathro

Registrar's Papers

Thursday, 16th April, Stracathro

Dr J. Ross, Dr D. White

"Closed Loop and Closed Circuit"

Thursday, 14th May, Stracathro

Annual General Meeting and Presidential Address

**GLASGOW AND WEST OF SCOTLAND
SOCIETY OF ANAESTHETISTS**

1986

Friday, October 31st

Combined meeting with Edinburgh and East of Scotland Society of Anaesthetists in Edinburgh
Professor Robert L. Morris, First Koestler Professor of Parapsychology

Thursday, November 20th,

Dr S. M. Willats, Consultant Anaesthetist,
Bristol Royal Infirmary.

"Justification for Parenteral Nutrition"

1987

Wednesday, January 28th

Members' Night—Presented by Members of the Ayrshire Division of Anaesthesia.

Tuesday, 24th February.

Dr M. Halsey, M. R. C. Clinical Research Centre,
Northwick Park Hospital.

"Clinical Implications of the Mechanisms of Anaesthesia."

Wednesday, March 25th

Presidential Address—Dr W. L. M. Baird.

Wednesday, April 22nd

Annual General Meeting

Thursday, April 30th

Annual Golf Outing—Buchanan Castle Golf Course

Unless otherwise stated, meetings will be held in the Royal College of Physicians and Surgeons of Glasgow, 242 St Vincent Street, Glasgow.

**EDINBURGH AND EAST OF SCOTLAND
SOCIETY OF ANAESTHETISTS**

1986

Tuesday, 14th of October

Dr G. B. Drummond

"The Shrinking Lung"

Friday, 31st October

Professor Robert L. Morris

"Integrative Parapsychology and Medicine
(Bangour) 6.30 p.m. for 7 p.m.

Tuesday, 2nd December

Professor I. A. D. Bouchier

"Gastrointestinal Haemorrhage"

1987

Tuesday, 6th January

Dr G. Park

"Anaesthesia and Intensive Care in Liver Disease
and Transplantation"

Tuesday, 3rd February

Professor John Nunn

"Nitrous Oxide Toxicity"

Tuesday 3rd March

Members' Night

Saturday, 21st March

Annual Dinner

Teviot Row House

Tuesday, 5th May

A.G.M.—Library of the Royal College of Surgeons

Unless otherwise stated, meetings will take place at 7.30 p.m. for 8 p.m. in the main hall of the Royal College of Surgeons of Edinburgh.

Registrar's Prize

The Society annually awards a prize of £150 for the best original paper or essay submitted by an anaesthetist in Scotland, holding the grade of Senior Registrar or under. A second prize of £75 or a third of £50 may be awarded for other papers of particular merit at the discretion of the assessors. It is not necessary that the Registrar be a member of the Society.

The conditions attaching to the award are as follows:—

1. The paper or essay must be original, i.e. it should not have been read previously at any meeting or published in any journal. The winning of the prize is in no way a bar to the subsequent publication of the paper in another journal.
2. It is desirable that papers submitted show evidence of personal work, but papers consisting of surveys of the literature are eligible for consideration. The Council of the Society wishes to stress that intending competitors should not be discouraged through fear of their efforts being judged elementary. It is fully realised that junior anaesthetists in some peripheral hospitals may not have opportunities to deal with special types of cases or to employ advanced anaesthetic techniques.
3. Papers for adjudication (4 copies) must reach the Secretary by the *end of February* at the latest.
4. The winner of the prize will be required to give a

digest of the paper at the Annual General Meeting of the Society towards the end of April. His/her expenses for the meeting will be met by the Society.

The Secretary places all entries in the hands of the Award Committee which consists of the President, Vice-President and Past President. The members of this Committee have expressed the desire to be able to adjudicate without knowing the name or hospital of the writer; it is requested therefore that the name, address, etc., of the entrant be submitted on a separate covering page. This will be retained by the Secretary, but otherwise the essay itself should give no indication as to its source: acknowledgement to colleagues etc., should not be included.

The prize for 1986 was won by Dr Rae Webster of Ninewells Hospital, Dundee, for her paper entitled "A New Method of Blood Glucose Control."

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