

NEWS LETTER



Founded
20th February, 1914

December, 1967
No. 8

THE SCOTTISH SOCIETY OF ANÆSTHETISTS

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Vice-President	-	-	-	-	-	Dr. J. R. KYLES, Kirkcaldy
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69 Campsie Drive, Bearsden, Glasgow

Editor of Newsletter

Dr. WALTER NORRIS

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“The objects of the Society will be to further the study of the science and practice of anæsthetics and the proper teaching thereof, and to conserve and advance the interests of anæsthetists.”

“Ordinary membership will be restricted to members of the medical profession practising the specialty of anæsthetics.”

—Extracts from the Constitution

Subscriptions

£1 per annum.

10/- per annum for Senior House Officers and Registrars.

Presidents of the Society since 1950

1950—Dr. John Gillies.	1959—Dr. Alison Ritchie.
1951—Dr. H. H. Pinkerton.	1960—Dr. A. Tindal.
1952—Dr. T. J. C. MacDonald.	1961—Dr. J. W. L. Bain.
1953—Dr. W. M. Shearer.	1962—Dr. Margaret Muir.
1954—Dr. I. M. C. Dewar.	1963—Dr. Alex. C. Forrester.
1955—Dr. F. G. Gibb.	1964—Dr. J. D. Robertson.
1956—Dr. H. Bruce Wilson.	1965—Dr. A. G. Miller.
1957—Dr. R. Lawrie.	1966—Dr. J. A. Bolster.
1958—Dr. R. N. Sinclair.	1967—Dr. A. W. Raffan.

Guest Speakers at Annual General Meeting

1951—Dr. W. W. Mushin.	1960—Sir Dugald Baird.
1952—Dr. M. H. Armstrong Davison.	1961—Dr. G. S. W. Organe.
1953—Dr. Ivan Magill.	1962—Prof. W. D. M. Paton.
1954—Prof. R. R. Macintosh.	1963—Prof. E. A. Pask.
1955—Dr. T. Cecil Gray.	1964—Dr. Martin Holmdahl.
1956—Dr. M. D. Nosworthy.	1965—Prof. J. G. Robson.
1957—Dr. J. Alfred Lee.	1966—Prof. A. Crampton Smith.
1958—Dr. L. B. Wevill.	1967—Dr. Sheila Kenny.
1959—Dr. Margaret Hawksley.	

Honorary Secretaries of the Society since 1950

1950-53—Dr. R. N. Sinclair, Glasgow.
1953-57—Dr. A. G. Miller, Glasgow.
1957-63—Dr. M. Shaw, Glasgow.
1963-67—Dr. A. H. B. Masson, Edinburgh.
1967 —Dr. D. Campbell, Glasgow.

Honorary Members

Dr. D. Keir Fisher, Glasgow.
Dr. John Gillies, Edinburgh.
Dr. D. S. Middleton, Edinburgh.
Dr. Margaret C. Muir, Dundee.
Dr. W. B. Primrose, Glasgow.
Dr. Winifred Wood, Coll.
Dr. H. H. Pinkerton, Glasgow.
Dr. Alison Ritchie, Edinburgh.

Senior Members

Dr. Ellen B. Cowan, Glasgow.
Dr. Margot W. Goldsmith, Edinburgh.
Dr. A. McCallum Millar, Edinburgh.
Dr. T. T. Stocker, Glasgow.
Dr. Elaine Stocquart, Glasgow.
Dr. Sheina Watters, Edinburgh.
Dr. A. M. Brown, Glasgow.
Dr. Mary Brown, Glasgow.

The Scottish Society of Anæsthetists

. . . Founded 20th FEBRUARY, 1914

A. CONSTITUTION

- (1) The name of the Society will be "THE SCOTTISH SOCIETY OF ANÆSTHETISTS."
- (2) The objects of the Society will be to further the study of the science and practice of Anæsthetics, and the proper teaching thereof, and to conserve and advance the interests of Anæsthetists.
- (3) The Society will consist of Honorary Members, Senior Members, Ordinary Members, a President, a Vice-President, a Secretary, a Treasurer, and an Executive Council formed by the above Office-bearers, together with seven Ordinary Members, two from each of the regions centred on Edinburgh and Glasgow, and one from each of the regions centred on Aberdeen, Dundee and Inverness.
- (4) Ordinary Membership will be restricted to Members of the Medical Profession practising the speciality of Anæsthetics.
- (5) Senior Members may be elected from Ordinary Members who have retired from active practice.
- (6) Honorary Members may be elected on the recommendation of the Council and with the approval of the Society. Such Honorary Members would be elected from those who, either as Anæsthetists or in other spheres, have contributed in some special way to the advancement of Anæsthesia.
- (7) A meeting will be held every year, at a time and place to be appointed by the Executive Council.

B. ELECTION

- (1) Ordinary Members may be elected by a two-thirds majority of those present, at any regular meeting, nominations by an existing Member to be sent to the Secretary one calendar month before the day of election.
- (2) Nominations for Vice-President, Secretary and Treasurer will be made annually by the Executive Council, and will be circulated to Members along with the notice of the Annual General Meeting. Any further nominations for these Offices may be submitted to the Secretary 14 days before the date of the Annual General Meeting.
- (3) Regional Representatives will serve on the Executive Council for a period not exceed-

ing three years, and on retiring from office will not be eligible for re-election to the Council within a period of one year.

- (4) Nominations for vacancies in the Executive Council created by retirement will be called for at the Annual General Meeting, and a ballot held if necessary.
- (5) The President who retires at the Annual Meeting will automatically become an additional member of the Executive Council for the ensuing year.

C. DUTIES OF OFFICE-BEARERS AND MEMBERS OF EXECUTIVE

- (1) The President will preside at the Meetings both of the Society and Executive Council, and will have a casting as well as a deliberative vote. He will hold office for one year.
- (2) The Vice-President will act for the President when required to do so. He will automatically become President for the following year.
- (3) The Secretary will keep all the records of the Society, will notify all Members of the business of the Society, and send accounts of the Meeting to the Journals. The Treasurer will collect subscriptions, pay accounts and render a financial statement to the Annual Meeting.
- (4) The Executive Council will be consulted by the President upon all matters concerning the conduct and interests of the Society, and will be permitted to record their vote by post upon any question in dispute.

D. SUBSCRIPTION

- (1) Ordinary Members will pay an annual subscription of £1; Registrars and House Officers will pay 10/-.
- (2) Any Member who has not paid his subscription for the current year may, at the discretion of the Executive Council, cease to be a Member of the Society.

E. GENERAL

- (1) No alteration of, or addition to, the rules may be made save at an Ordinary Meeting after one month's notice given to the Secretary, who will place the suggestion upon the Agenda.
- (2) Personal as well as official guests may be invited to the Meetings and Dinners of the Society.

Activities of the Year, 1966-67

Registrars' Meeting

Aberdeen, 14th October, 1966

This meeting was attended by 36 junior anaesthetists from all centres. During the morning demonstrations of various techniques and of new equipment were offered as follows:—

1. Intravenous regional anaesthesia.
2. Chairside dental anaesthesia.
3. Monitoring equipment.
4. Ventilators for neonates.
5. New techniques in obstetrics.
6. Basic neonatal techniques.
7. Hyperbaric Oxygen Unit.

In the afternoon short papers were delivered by members of the staff of the department in Aberdeen on the following subjects:—

1. Aspects of premixed gases.
2. Alcohol and surface cooling.
3. The use of I.P.P.R. in the neonate.
4. Recent developments in dental anaesthesia.

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The Annual General Meeting was held in Pitlochry Hydro from 21st to 23rd April, 1967, and is reported in detail later in the Newsletter.

The Eighth Scientific Meeting was held in Glasgow on Saturday, 27th May, 1967, when a large number of members attended. Two papers were presented—

Dr. J. B. West of the Royal Postgraduate Medical School, Hammersmith, speaking on "Pulmonary Causes of Hypoxaemia."

Dr. D. C. Flenley of Edinburgh speaking on "Oxygen Therapy in Medical Respiratory Problems with particular reference to Respiratory Failure."

Abstracts of both papers prepared by the speakers are presented on page 13.

A lively discussion followed in which many members took part.

The Neurosurgical Anaesthetists Travel Group held a meeting at Killearn Hospital on 17th June, 1967.

Papers were read by Drs. S. Tindal, J. Barker and A. H. Granat on subjects of neurosurgical interest and a very full discussion of the problems followed.

In the afternoon papers were read by Mr. R. Tym, Neurosurgeon, and Dr. R. Connor, Pathologist, and these were also followed by a lively discussion. Eleven anaesthetists, one surgeon and one pathologist attended the meeting.

Payment of Annual Subscription by Banker's Order

FROM time to time, members have requested that they be allowed to pay the annual subscription to the Society by Banker's Order. It was realised that this would be of benefit to the member and to the Society alike, but with successive secretaries operating through different banking accounts it was not considered workable to inaugurate such a scheme.

Arrangements have now been made whereby those members who prefer to pay the annual subscription by Banker's Order may do so through the Head Office of the Bank of Scotland, The Mound, Edinburgh. The Society's financial year ends 31st March, and payment by Banker's Order may therefore begin with the subscription for the ensuing year, payable 1st April. The scheme is commended to members for their own convenience, for the Society's financial situation, and for the facilitation of the Hon. Treasurer's duties.

A form suitable for use is available on application to the Hon. Treasurer.

Annual General Meeting — Pitlochry

PITLOCHRY was the venue of the Annual Meeting in 1967, and after the successful meeting in Inverness had a great deal to live up to. The week-end provided an excellent blend of business and pleasure. On the Friday evening some 40 members went to the Festival Theatre to see "On the Rocks."

The Saturday morning was divided between the golf course and the scientific exhibits, and both provided food for thought.

At the Annual General Meeting in the afternoon, Dr. Raffan on taking office as President for the ensuing year paid tribute to Dr. Bolster for his care of the Society during his year in office. He also thanked Dr. Masson, Dr. Milne and Dr. Shaw for the strenuous efforts they had expended for the Society during their years in office. The Society has now over 200 members and a strong balance sheet, but the need to continue recruiting remains.

The scientific part of the meeting was provided by the excellent address delivered by Dr. Raffan, the Registrars' paper delivered by Dr. Martin and by Dr. Kenny's delightful contribution.

In the evening the reception and dinner in the beautiful surroundings of the Hydro were enjoyed by all those present. Perhaps the greatest tribute to this week-end is that the Annual Meeting in 1968 is again being held in Pitlochry.

Golf

This year the golf match was played over the nine-hole course adjoining the Hotel. The weather was superb, being calm with brilliant sunshine. The views of the mountains all around were really not to be missed and, indeed, this may well have accounted for the number of times that eyes strayed from the ball!

In keeping with modern fashions the course was rather a mini-course, twice round being less than 4,000 yards, but the greens were micro-greens and getting the ball on to the green was rather like trying to put a ping-pong ball into a bucket! Having reached the putting surface, one's problems were by no means over—the greens were fast and the borrows somewhat teasing.

Such disadvantages were more than outweighed by the company, the weather, and the

fact that the 19th hole was reached by 11.15 a.m.! The winners were as follows:—

Gents—1, Dr. A. W. Raffan, Aberdeen; 2, Dr. Donald Moir, Glasgow; 3, Dr. W. L. M. Baird, Glasgow. Ladies—Dr. Lillie Dummer, Edinburgh.

EDINBURGH AND EAST OF SCOTLAND SOCIETY OF ANÆSTHETISTS

Syllabus 1967-68

Meetings will be held in the Royal College of Surgeons, Nicolson Street, on the **second Tuesday** of each month, unless specified otherwise. Tea at 7.45 p.m. for 8 p.m.

1967

Saturday, 21st October

Combined Meeting with Glasgow and West of Scotland Society of Anæsthetists will be held in the Royal College of Physicians and Surgeons, 242 St. Vincent Street, Glasgow, at 5.12 p.m.

"Myasthenia Gravis and the Anæsthetist"—Professor J. A. Simpson, University of Glasgow and the Department of Neurology, Killearn Hospital.

A Buffet Supper will follow the Meeting.

Tuesday, 14th November

Presidential Address—Dr. J. D. Robertson.

Tuesday, 12th December

Dental Anæsthesia—Dr. A. H. Galley, King's College Hospital, London.

1968

Tuesday, 9th January

Symposium on Asthma—Dr. I. W. B. Grant, Dr. G. R. McHardy, Dr. H. Simpson.

Tuesday, 13th February

Members' Short Papers.

Friday, 1st March

Informal Dinner at the University Staff Club.

Tuesday, 12th March

Symposium on Sterilisation of Anæsthetic Equipment—Dr. J. H. Bowie, Dr. T. B. M. Durie, Dr. P. J. Helliwell, Guy's Hospital, London.

Tuesday, 30th April

Annual General Meeting.

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All details of these meetings may be had from the Honorary Secretary, Dr. W. R. Macrae.

Presidential Address . . .

. . . Dr. RAFFAN

Sleep — "The Golden Chain"

The subject of natural sleep, Macbeth's "Sleep that knits up the ravel'd sleeve of care," seems to have been sadly neglected in our anaesthetic literature, and yet anaesthetists habitually enquire about their patients' sleeping habits. We are all agreed that a good night's sleep is a great advantage, if not an essential, before surgical intervention in the morning, and so with a knowledge of the patient's normal standards of sleep one can arrange sedation accordingly. Similarly, we have some responsibility in producing rest and sleep in the immediate post-operative period.

A talk, then, on this recurrent healthy state, this state of inertia and unresponsiveness, seemed to me a worth-while subject for this Presidential Address.

Physiology

When we fall asleep the eyelids close, the pupils become small, the secretion of saliva, of digestive juices, and of urine fall sharply. The total flow of air breathed is also decreased. Alveolar CO_2 rises above waking level. The heart slows, the blood pressure falls. The temperature also falls, maybe as low as $96.5^\circ F$. Consciousness is lost, but it is a temporary loss, for, unlike the state of anaesthesia, a sufficient stimulus will cause the return to wakefulness.

There is great variation in the amount of sleep taken by different individuals, and there is possibly no subject in which self-deception plays a greater role than one's personal assessment of the amount of sleep taken—or missed.

Theories

The reasons for our need for sleep and the mechanism by which we achieve it have puzzled philosophers and physicians for over two thousand years. The first theories were concerned with the shifting of the blood from one part of the body to another, a congestion or an anaemia of a vital organ.

Aristotle, in 330 B.C. (1) wrote, sleep "arose from the evaporation attendant upon the process of nutrition," hence one gets fits of drowsiness after meals. The discovery of the

circulation by Harvey altered these concepts, but sleep was not studied until the 18th century when Willis and Morgagni were convinced that it resulted from a congestion of the brain with blood. This idea held in 1914 when Shepard (2) demonstrated such a plethora. Even in 1955 Mangold (3) found an increase in cerebral blood-flow during sleep, but now we are told that the total blood flow through the brain during sleep is not altered, although there may be local alterations which cannot be measured. We do know, by oximetry, that in deep sleep arterial oxygen saturation may fall from 96% to 87%, and this must have an effect on the patient with atheroma of the carotid arteries, and whose blood pressure (systolic) sinks from 170 to 80 during sleep. Such a patient is a candidate to "pass away peacefully in his sleep."

24-hour rhythm of sleep

We learn by experience a 24-hour rhythm of inactivity. Kleitman (4) showed an hourly periodicity to be inborn, gradually extending to the adult 24-hour mode, which appears to be dependent on the cerebral cortex. There are also inner thermostats in the hypothalamus controlling the variations of temperature throughout the 24 hours.

Of immediate practical importance is the 24-hour rhythm of alertness as it affects skill. One cannot display one's abilities to best advantage except during a certain portion of the 24 hours. First thing in the morning and late in the evening, one is less efficient than around mid-day. Even if thoroughly awakened in the night, one cannot expect to perform at one's peak. Pauses and brief breaks in performance are characteristic of the sleepy person for whom long-continued, sustained attention is impossible.

This should serve as a warning to us. We may think we can defy these firmly ingrained rhythms, but we may not be the best judge, any more than a person who has consumed alcohol is the best judge of his skill. Sleepiness and alcoholic intoxications have a lot in common, and reinforce one another if both are present. Either can cause diplopia and slurring of speech. The very sleepy person

Measurement of sleep

Sleep can be measured subjectively by questioning the patient, but for more accurate assessment one can measure the movements a person makes during sleep. However, the study of sleep has leapt forward with the discovery of the E.E.G. According to Loomis (5) there are five stages, starting with the alpha-rhythm of Stage A, Stage B, Stage C with its sleep spindles and K complexes, and finally the deepest stages D and E. The normal pattern of sleep during the night is that it starts with the A stage, passes gradually and almost imperceptibly into B and on into the deepest stage. After a period in D or E, sleep lightens again to B or C. The deepening process is a gradual one, whereas the reverse is always sudden.

Mechanism of sleep

The Belgian Physiologist, Bremer (6), tried to elucidate the mechanism of sleep in cats. He found, when he made a cut through the upper brain stem, *cerveau isolé*, that the animal remained alive, but quite inert, with an E.E.G. resembling that of sleep. When he made a cut across the brain lower down, about where the cord begins, *encéphale isolé*, he obtained periods of wakefulness alternating with sleep. He concluded that in the brain stem, the area between his two incisions, there was a Master Zone, the Reticular Formation, which regulated the rhythm of sleep and wakefulness.

Stimulants of reticular formation

A number of things help to keep the reticular formation excited. Whenever a sense organ is stimulated the message passes from it to the brain, some going to the reticular formation, and if the stimulus is violent enough the reticular formation suddenly becomes very excited and we are abruptly alerted. It may not require a loud bang, a quiet whisper can do so just as easily if the words are cautionary. The message passes to the cortex for assessment and the cortex can then alert the reticular formation. Equally we are aware how worry can keep us from sleep, there again the cortex signals the Master Zone so keeping it active. This is particularly our problem in pre-operative care. It is for us to allay apprehension, inspire confidence, and reinforce our actions, if necessary, with sedatives.

Other sources of reticular formation excitement are chemical—an excess of CO₂, a shortage of oxygen, any interference with breathing will quickly cause waking. Adrenaline also excites the reticular formation, producing a vicious circle as adrenaline is released into the blood when one is apprehensive. This vicious circle is only broken by the distension of the carotid sinus by the raised blood pressure, and the nerve impulses from there to the brain stem, which damp down the reticular formation.

Depressants of reticular formation

Depressants of the reticular formation are the very monotony of some occupations—long distance driving, watching a radar screen, railway engine driving, all tend to produce sleep, and sleep becomes a definite hazard if there has been a shortage of night-time sleep.

Amount of sleep required

In adults there are big variations in the amount of sleep required, some claim to do both day-time and night-time jobs, and never go to bed! It is said that women need more sleep than men. In non-stop daylight, in an Antarctic expedition the average was found to be the traditional 8 hours. It is often said that one hour before midnight is worth two after, but it all depends on one's habit. What is certain is that the restorative processes of sleep are at a maximum in the first couple of hours.

Sleep deprivation

The effect of chronic restriction of the hours of sleep is to produce irritability, and lowered resistance to infection, and after long periods without any sleep one gets a condition very like alcoholic intoxication; the main and perhaps the only difference between the alcoholic state and the sleep-deprived state is that the threshold for pain is raised in the former and very much lowered in the latter.

In acute total sleep loss the liability to drift into light sleep is enormously enhanced. This quick drift into light sleep, lasting a few seconds, can easily be seen on the E.E.G. "Micro-sleeps" as they are called, and it is thought that it is these micro-sleeps which cause the delays in reaction time which become apparent after sleep-deprivation.

Given plenty of time a task may be completed efficiently, but if time is restricted, if required to sustain activity, if the pace of performance is imposed by some exterior agency, as in the conveyor belt requiring inspection, then the sleep-deprived person makes frequent errors of omission and commission.

Carried to extreme, sleep-deprivation can produce gross irrationality, hallucinations, and it is becoming clear that there is a chemical imbalance in the brain.

Recent work from Prague, Kuhn (7), has shown that after 70 to 120 hours without sleep young healthy volunteers have shown certain metabolic changes:—impaired carbohydrate metabolism, the blood sugar curve resembling the pre-diabetic; plasma iron falling to 55% of the original, and the white blood count gradually rising, so that clinically a high leucocyte count may not mean an inflammation, but may be a sign of shortage of sleep.

Dreaming and paradoxical sleep

There is a recurrent cyclical pattern in sleep, in infants every hour, in adults every hour and a half, when there are movements of the eyes, rapid eye movements, with low voltage waves in the E.E.G. after the alpha-rhythm has disappeared, and quite distinct from the big waves of deep sleep. It has been proved that it is during these periods of rapid eye movements that one dreams.

After barbiturates there is a very much lower incidence of eye movements, compared with normal unsedated sleep. If profuse eye movements mean active dreams, then barbiturates give one a more tranquil sleep. At the same time barbiturates have an effect on the blood pressure during sleep. In a study of the blood pressure during sleep, recorded automatically, at 5-minute intervals by the Cambridge Recorder, the normal, unsedated sleep pattern is of a gradual lowering of the systolic pressure, but it is not a consistent lowering, there are spikes of recovery of the pressure to near normal co-incident with rapid eye movements and low-voltage waves on the E.E.G. Under sedation by barbiturates one does not see so many of these recovery "spikes" of pressure, there is a more consistent lowering of the systolic blood pressure. For example, in a normal adult aged 54 with a systolic B.P. of 145, 42% of the readings during sleep were below 120 if there was no sedation, whereas after seconal (quinal-

barbitone sod.) 75% were below 120 mm Hg. After Mogadon (Nitrazepam) the readings were similar to unsedated sleep, whereas after Mandrax (Methaqualone) 94% were below 120.

Professor Jouvet has analysed the sleep of cats (8). He recorded muscle activity and found that the muscles at the back of the neck remained tense in deep sleep, but they relaxed totally when the E.E.G. changed to low voltage with rapid eye movements. Serial sections through different parts of the brain proved that the pons controls this type of sleep, which Jouvet called hind-brain or paradoxical phase of sleep, and this paradoxical phase applies in humans, too, according to Berger & Oswald (9).

In another experiment Jouvet (10) deprived cats of paradoxical sleep and found that in the recovery period the percentage of paradoxical sleep increased to a maximum of 60% of the sleeping time. In human beings, deprived of paradoxical sleep by barbiturates, there was an increase to twice the normal in the recovery period.

Insomnia

Lack of sleep is a psychological stressor and stress produced by loss of sleep or by any other cause can cause anxiety and tension, and, of course, these are the very factors which in themselves promote insomnia.

The great majority of people who complain of occasional insomnia are otherwise normal individuals, but the lives they lead are simply fraught with more problems than others. Largely because of temperament, they see more problems in life, more easily worry, have greater ambition, more responsibilities, and sometimes more guilt. However, it is not only a matter of temperament for it has been proved in an extensive survey that age is also of importance, McGhie & Russell (11). As age increases people more often complain of disturbed nights, and older people are more liable to resort to sleeping tablets, because they ensure a quick escape from harsh reality: thus the addiction is born.

Barbiturates powerfully suppress paradoxical sleep, and the nervous system of addicts becomes so adjusted to functioning in their presence that the sleep becomes practically normal. When they are stopped a tremendous rebound occurs; paradoxical sleep becomes twice the normal, and with it there is an

excess of dreaming and actual nightmares. Sudden withdrawal of sleeping pills will produce violent repercussions in a nervous system adjusted to them, but if patients can be persuaded to stop the habit, sleep will return to normal although this may take some time.

The conditions which are conducive to sound natural sleep can never be the same for everyone, but, in general, a warm comfortable bed, no heavy meal for a few hours beforehand, a hot drink—perhaps whisky, a hot bath (some prefer a tepid one), a brisk walk, all may help to solve this intractable problem, but the remedies and suggestions are as varied as human beings.

Nowhere in physiology has the pace been faster in the last decade than in the study of sleep, and so it seemed to me that this subject would be a suitable one for a Presidential Address, the more so when one recalls the words of Thomas Dekker—

“Sleep is the golden chain that ties health and our bodies together, to use it but indifferently throws us into Bedlam.”

Guest Speaker . . .

The guest speaker was Dr. Sheila Kenny of Dublin. She took as the title of her paper—“The Petals Unfold.”

For almost a hundred years during which the specialty has been developing, the hallmark of prowess in anaesthesia has been technical proficiency. Only recently has the anaesthetist widened his scope into teaching, research and administration, and work outside of the operating theatre, and it is this development into the full Consultant status to which the unfolding of the petals of a flower is compared. Anaesthesia may be likened to a plant whose tap root is technical proficiency. As in horticulture the strength of this plant and the quality of the blossom depend on the limiting of the tap root and the development of side roots. These side roots may be considered to be research, teaching and administration.

Only too often there is a wide breach of interest between the clinical and the research anaesthetist, and there may be a singular lack of communication which deprives the clinician of much essential knowledge and the research

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. . . Dr. SHEILA KENNY

worker of excellent material. This has delayed progress as witness the delay between the first reports of “Neostigmine Resistant” curarisation and the full understanding of the biochemical upsets which may underly this condition.

The results of research are not always of immediate value and the introduction of the hypodermic needle and the glass syringe were followed many years later by local anaesthesia, and, subsequently, the introduction of intravenous anaesthesia. Similarly, while John Snow was forced to abandon the use of curare in the early 1850's because of lack of supporting pharmacological research, many years later the drug was introduced into anaesthetic practice and later still the anaesthetist used curare and I.P.P.V. in the control of tetanus. This is one sphere in which the anaesthetist can co-operate with other specialists.

There are now many ways in which this co-operation has been extended following the introduction of hypothermia, the artificial circulation and controlled hypotension; the application of this last technique is of parti-

cular personal interest. There are many physiological reasons for the safety of this technique, and it has been widely used to facilitate surgery in many specialties. When used in ophthalmic practice it not only provided good bloodless operating conditions, but it was noted also that it produced a fall in intraocular tension. The ability to thus reduce intraocular tension had obvious potential applications outside of the operating theatre and these were explored in Ireland with the co-operation of ophthalmic colleagues. Controlled hypotension now plays an important part in the treatment of hyphæma, and is also used to reduce intraocular tension pre-operatively in cataract surgery and other sight preserving operations.

In treating acute glaucoma when conservative measures have failed, hexamethonium may be used to break the vicious circle of raised intraocular tension. This extended use of the well-known anæsthetic technique has been a major advance in ophthalmology.

The value of hexamethonium has also been demonstrated in the treatment of acute pancreatitis. The use of vasodilator drugs in the treatment of shock is another field in which the anæsthetist can play a valuable part; the dramatic change in the patient from being cold, grey and pulseless, to being warm and pink, coupled with the ability to replace fluid loss without causing pulmonary congestion is an evident virtue of this therapy. The marked contrast in results obtained by vasodilatation and sedation as opposed to the older method whereby vasoconstrictor drugs were used is only too obvious.

The anæsthetist with his knowledge of pain relief, ventilator therapy, and the metabolic needs of the patient is ideally suited to look after severely ill patients. Many anæsthetists have put this knowledge to use in the treatment of respiratory and metabolic disorders in intensive care units.

One of the greatest achievements of Sir Frederick Hewitt was his ability to lay foundations for the future. He was responsible for introducing the teaching of anæsthesia to medical students. It is thus very sad to see the present draft recommendations for basic medical education which omit any reference to anæsthesia. This is particularly unfortunate now when it is widely recognised that the specialty of anæsthesia is no longer limited to the practical administration of anæsthetics. The anæsthetist has much to impart to the medical student, not only in the

care of the unconscious patient, the treatment of respiratory inadequacy, and in resuscitation, but also in applied physiology, biochemistry and pharmacology. This need for teaching is a challenge which should be met by all anæsthetists privileged to work with medical students.

The future of our specialty will depend on the way in which anæsthetists meet this and other challenges. If the clinician can cooperate with the research worker and blend science with the humanity of medicine, then anæsthesia may unfold into a bloom of rare beauty whose perfume will pervade the whole medical atmosphere.

GLASGOW AND WEST OF SCOTLAND SOCIETY OF ANÆSTHETISTS

Syllabus 1967-68

1967

Saturday, 21st October, at 5.15 p.m.

Joint meeting in Glasgow with Edinburgh and East of Scotland Society of Anæsthetists.

"Myasthenia Gravis and the Anæsthetist"—
Prof. J. A. Simpson, University of Glasgow.

Tuesday, 5th December

"The Physiology of Pain"—Dr. J. Clutton-Brock, Bristol.

1968

Tuesday, 9th January

Symposium on Neuroleptanalgesia — Dr. Sheila Jennett, University of Glasgow; Dr. C. Prys-Roberts, University of Oxford; Dr. G. Barry Smith, The London Hospital.

Monday, 12th February

Members' Night. Staff of Department of Anæsthetics, Killearn Hospital.

Monday, 18th March

Presidential Address—Dr. A. Harvey Granat.

Monday, 1st April

Annual General Meeting.

Saturday, 6th April

Visit to Falkirk and District Royal Infirmary.

* * *

Unless shown otherwise, meetings will be held at the Royal College of Physicians and Surgeons, 242 St. Vincent Street, at 8.15 p.m. Tea will be served from 7.45 p.m.

Notice of each meeting will be sent to members.

The Registrars' Prize

THE Society awards annually a prize of £35 for the best original paper submitted by an anaesthetist in Scotland, holding the grade of Senior Registrar or under. It is not necessary that he/she be a member of the Society.

The conditions attaching to the award are as follows:—

1. The paper 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.

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 **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.

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; acknowledgment to colleagues, etc., should not be included.

The Prize for 1967 was awarded to Dr. L. V. H. Martin of Edinburgh for a paper entitled "Observations on the Halox Vaporiser." The following is a summary of the paper prepared by Dr. Martin:—

Observations on the Halox Vaporiser

The Halox vaporiser was introduced with the British Oxygen Company's latest Boyle's machine, and this paper examines some of the

physical principles involved in its design and attempts to assess how far these affect its usefulness.

In a conventional vaporiser the entering gas stream is divided into two, a small part passing through the vaporising chamber and the larger part passing through a bypass. The concentration of vapour delivered to the patient is determined by varying the relative amounts of the two streams. The variable factors in vaporisation have been largely eliminated by ensuring that the stream passing through the vaporiser emerges fully saturated, and by using thermo-compensatory valves which change the relative proportion of the two gas streams as the liquid temperature varies. It is now possible to deliver gas containing a known and constant percentage of vapour under a wide range of conditions.

In the Halox vaporiser, the entering gas stream is not divided but a separately metered oxygen stream is bubbled through the halothane and becomes saturated before joining the main gas stream. The percentage delivered to the patient depends on total gas flow, oxygen flow through the halothane and temperature of the halothane and a calculation with a slide rule is necessary to determine the final percentage. A change in any of the variables requires another calculation.

The use of the vaporiser can be simplified by maintaining total gas flow at 8L/min. The other two variables can then be related graphically. This method is nullified if significant changes in halothane temperature occur as a result of the vaporisation of the halothane.

The changes in temperature of the halothane resulting from the passage of constant streams of oxygen through the liquid were investigated both in temperature climates where average temperatures are about 20°C and under tropical conditions when temperatures are 30°C and above. It was found that as oxygen was bubbled through the halothane, thus vaporising some of the liquid, the temperature of the remaining liquid falls. The fall in temperature gets progressively greater as the oxygen flow is increased. Graphs show an initial steep fall which becomes flattened after 30-40 minutes and thereafter remains virtually flat. The higher the starting temperature the greater the fall in liquid temperature as time passes.

These temperature changes are not significant when low oxygen flows such as are required for closed circuits are used, but for other circuits they may produce variations of delivered concentration of up to 2%.

Thermo-compensation by means of a water jacket reduced the temperature variations but did not eliminate them. An attempt was made to use the constant temperature occurring during crystallisation as a chemical thermostat using Calcium Chloride (melting point 30°C) and Glacial Acetic Acid (melting point 16°C) under tropical and temperature conditions respectively. This produced no improvement over the use of a water jacket, and it was concluded that although providing a reservoir of heat round the vaporiser improved its temperature stability, its effect was limited by the low conductivity of the glass container.

The following conclusions can be drawn from this study:—

(1) The Halox vaporiser is a satisfactory means of supplying halothane to a closed circuit when a basal gas flow is used.

(2) When circuits requiring higher total gas flows are used, its use is complicated and attempts at simplification are largely nullified by the variation of temperature produced by the vaporisation of the halothane.

(3) It is not possible to stabilise the halothane temperature without substituting a container with a high thermal conductivity for

the glass at present used. In practice, this would mean using copper which has been ruled out on the grounds of expense.

(4) It would, therefore, seem that the Halox vaporiser has little advantage over an ordinary Boyle's bottle, and it does not appear to be an advance in vaporiser design.

NORTH-EAST OF SCOTLAND SOCIETY OF ANÆSTHETISTS

Syllabus 1967-68

Meetings are held at 8 p.m. in Aberdeen Royal Infirmary, Dundee Royal Infirmary, or in Stracathro Hospital, Brechin.

1967

Thursday, 12th October—Aberdeen

“The Prevention of Hypoxia in Flight”—
Wing Commander J. Ernsting, O.B.E.,
R.A.F.

Thursday, 9th November—Stracathro

“Feature Card Indexing for Anæsthetic
Literature: A Lecture Demonstration”—
Dr. J. I. M. Lawson and Dr. W. M.
Shearer.

1968

Thursday, 4th April—Dundee

“The Flowers that Bloom in the Spring”—
Dr. M. H. Armstrong Davison.

Thursday, 16th May—Stracathro

Presidential Address—Dr. E. Harvey Franks.
Annual General Meeting.

The Scottish Society of Anæsthetists

Programme for 1967-68

1. Registrars' Meeting—Glasgow.
Friday, 20th October, 1967.
2. Neurosurgical Anæsthetists' Travel Group—
Enquiries should be made to Alan S.
Brown, Edinburgh, or to Dr. A. Harvey
Granat, Killearn Hospital, Glasgow.
3. Thursday, 29th February, 1968.
Closing date for submission of papers for
Registrars' Prize.
4. Annual General Meeting—Pitlochry Hydro
Hotel—26th-28th April, 1968.
Guest Speaker—Dr. Patrick Shackleton,
Southampton.
5. The Association's Scientific Meeting will
be replaced by the Scientific Meeting of
the Faculty of Anæsthetists to be held in
Glasgow on 11th May, 1968. The subject
of the Symposium is “The Mode of Action
of Anæsthetic Drugs.”

Scientific Meeting — Glasgow

20th May, 1967

"Oxygen Therapy in Medical Respiratory Problems with particular reference to Respiratory Failure"

by D. C. FLENLEY

Department of Medicine, Royal Infirmary
of Edinburgh

Abstract

The biochemical usage of oxygen was briefly discussed and the concept of oxygen delivery to the cellular mitochondria developed. The problems of oxygen transport, from measurements of oxygen uptake, arterial P_{O_2} and cardiac output, were considered in terms of the P_{O_2} at various sites in the body, and in particular the oxygen diffusion through the tissues was calculated on the assumption that the mitochondria require a P_{O_2} of 10 mm. Hg.

Normal man, at rest and exercising at altitude was considered, and patients with lobar pneumonia, acute bronchial asthma, left ventricular failure, cardiogenic shock and acute exacerbations of chronic bronchitis were considered. In addition, the effects of high (60%) and low (30%) oxygen on the oxygen transport mechanisms in such patients were considered. On these theoretical grounds, it was concluded that oxygen therapy probably had little place in lobar pneumonia, but in left ventricular failure and cardiogenic shock high concentrations were needed. In severe status asthmaticus low concentrations of oxygen were probably insufficient whereas 30% oxygen in the bronchitic was probably sufficient.

The controlled oxygen therapy of respiratory failure arising in chronic bronchitis was described. It was proposed that the aim of therapy should be to maintain the arterial P_{O_2} above 50 mm. Hg, without depressing the arterial pH below 7.25. The results, in terms of outcome and blood gas values, of treating 50 such cases were described. This analysis confirmed that these limits to guide therapy were valuable in practice. Intermittent positive pressure respiration for acute exacerbations of respiratory failure in the bronchitic was only indicated if such limits could not be met.

Pulmonary Causes of Hypoxaemia

by Dr. J. B. WEST

Royal Postgraduate Medical School
of Hammersmith

The prime function of the lung is to exchange gas between air and blood. In a perfect lung, the partial pressure of oxygen in the blood draining from the lung would be the same as that of alveolar gas. The actual lung falls short of this ideal in three respects which correspond to three of the causes of hypoxaemia in disease.

Firstly, the oxygen tension of blood in the pulmonary capillary never quite reaches that of alveolar gas, because movement of oxygen across the alveolar membrane is by a passive diffusion process from an area of high partial pressure to one of low partial pressure. Secondly, there is always some blood in the arterial system which has not been through ventilated areas of the lung; this is referred to as shunted blood. Thirdly, because blood flow and ventilation are not evenly matched in the lung, the lung is less efficient at transferring oxygen and carbon dioxide and this is a further potential cause of hypoxaemia. A fourth cause is hypoventilation when the rate at which fresh oxygen is brought into the lung is too low for the rate at which it is removed by the blood and there is therefore a fall in alveolar and blood oxygen tensions.

Until recently, little attention has been given to topographical differences within the lung. However, measurements with radioactive gases show that blood flow to the dependent regions of the lung far exceeds that to the upper parts. The reason for these differences is the changing relations between pulmonary arterial, venous and alveolar pressures throughout the lung because of the hydrostatic effects in the vascular system. In addition to these regional differences in blood flow there is also a gradient of ventilation down the lung. Ventilation is normally higher in the dependent regions than the uppermost, but the differences are less marked than for blood flow. Inequality of ventilation can be explained by regional differences in intrapleural pressure. It seems that the intrapleural pressure is less negative at the bottom of the lung than the

Continued on next page.

Editorial Notes . . .

Dr. W. NORRIS

IT is appropriate to begin these notes with an appreciation of the service rendered to the Society by Dr. Malcolm Shaw who so ably edited the Newsletter from its inception. Dr. Shaw was ubiquitous in his search for material for the Newsletter and his wide interests and travels were reflected in its pages. This year there are changes in format. Since the Society is a national one and one of the attractions of it are the opportunities to meet colleagues from all over the country, it seemed a worthwhile venture to include news from the regions in the Newsletter. The grouping of the scientific papers and the inclusion of a fairly lengthy summary of the presidential address will it is hoped prove helpful. The main object of the Newsletter, however, remains the same—to bring news of the activities of **your** Society to **you**. Its form and composition are largely based on tradition, the editor's ideas and on members' suggestions. If you have any suggestions which you feel would improve the layout or contents they will be most welcome.

Council have been concerned with the problems of the recruitment of new members to the Society and there is little doubt that this could be greatly increased to the benefit of all concerned. We are a national Society complementary to, rather than in opposition to the regional societies. The activities of the Society, reported elsewhere in the Newsletter, reflect its nature and in a year there is something to interest every anaesthetist. Clearly some of the meetings will appeal more to some members than others, and indeed in the nature of the meetings the attendances are often restricted. What can be done? Recruiting campaigns by Council on an official basis are of limited value, although no opportunity is lost of drawing the activities of the Society to the attention of potential members. The best chance of success, however, lies in the effort of individual members to recruit present and newly arrived colleagues to our ranks. If, by example, you attend Society meetings regularly your exhortations will carry more weight. The Registrars' Meeting is open to non-members so that junior members may see what the Society does and guests are welcome at the Scientific Meetings. The subscription is not high and is allowable against income tax. Will you see what you can do this year?

Still on the subject of recruiting, most hospitals are finding increasing difficulty in attracting an adequate number of applicants for posts, at least in the junior ranks. It is difficult to say what attracts recruits to the specialty and indeed there are often a number of factors involved. Be this as it may, one of the powerful factors is the image which the specialty presents to the student and post-graduate. While physicians and surgeons occupy a large amount of the undergraduate's time and in the pre-registration year the newly qualified doctor can assess the opportunities in the "major" specialties, the undergraduate has little contact with the anaesthetist and the susceptible postgraduate is little better off. Again it seems that we will require to take active steps to see that the image of anaesthetics is projected in the right places. To those members working in undergraduate teaching hospital falls the responsibility of trying to interest students in our work. This is possible not only by making lectures and tutorials as interesting as possible, but by encouraging students to participate in the anaesthetists' duties in theatre, wards, recovery rooms and intensive care units. Only in this way can the undergraduate evaluate our specialty. In a similar fashion we can encourage postgraduates to join our ranks by showing a good example of the functions of the modern anaesthetist. This approach, which has been widely and successfully used in the past, is likely to remain our mainstay in the foreseeable future. While the shortage of doctors remains we must endeavour through our own efforts to obtain our fair share of recruits.

Continued from previous page.

top, because of the way the weight of the lung is supported inside the chest.

Recently a third kind of inhomogeneity has been added to these measurements of blood flow and ventilation. Measurements on frozen intact dogs show that the alveoli themselves are much smaller in the dependent parts of the lung than at the top. Again this appears to follow from the way the lung is supported inside the chest. These small dependent alveoli will be particularly prone to collapse, and since the major share of the bloodflow goes to lower zone, hypoxaemia must follow.

News from the Regions

Western Region

There have been many changes in the region in the past 12 months. The first Scottish Chair in Anaesthetics has been established in Glasgow University and the first holder is Dr. A. C. Forrester—a past president of the Society. A University Department has also been established in the Western Infirmary under the care of Dr. Gordon McDowall. At last also the crying need for more staff in the region has been recognised, and additional Consultant and Senior Registrar appointments have been made. As new hospitals continue to be opened and existing units expand, however, the demands on the anaesthetic services in the region also expand and it continues to be difficult to fill some posts.

One development which is very welcome is the establishment of courses of lectures under the aegis of the Postgraduate Medical Board, aimed at trainee anaesthetists. While there have been concentrated courses available for some time, it has always been difficult for more than one or two trainees from each hospital to attend. The new courses are arranged on a set afternoon each week and every effort will be made to allow all trainees to attend the appropriate course on a half-day release basis.

We look forward to acting as hosts to the Registrars' Meeting in October and to the Faculty Scientific Meeting in Glasgow in May. This latter meeting will replace the Society Scientific Meeting in 1968.

Finally, it is with deep regret that we record the death of Dr. A. K. Boyle last year. Dr. Boyle, who was for many years Senior Anaesthetist at the Southern General Hospital in Glasgow, was a well-known and respected figure whose passing will be felt and mourned by many members of the Society.

South-East Region

During the last year or so there have been many changes in the staff in the South-East Region. This has been due mainly to the appointment of Senior Registrars to the Consultant ranks. These ambassadors of, we hope, good will have spread widely throughout the country, as far apart as the South of England and the West of Scotland. The most recent appointment is that of Dr. Iain

Davidson to the new Consultant post in the Edinburgh Royal Infirmary.

It is with great regret that we note the death of our good friend Callum MacQueen, after a long illness. It was fortunate that he he could attend the Saturday afternoon meeting at Pitlochry this year and there renew many old friendships. He was able to continue his work in the Hospital up until a few days before his death.

The Anaesthetic Department in the Edinburgh Royal Infirmary has recently acquired new quarters, moving from the top of the building to the bottom corridor. The Department is at present undergoing very extensive structural alterations which will provide much improved accommodation for all who use it.

Social functions throughout the year have flourished once more, and it has been pleasant to find no shortage of organisers and willing helpers. Two main events are worthy of further comment, the first being the Children's Picnic. This was held for the second year at Tantallon Beach and was again blessed with near perfect weather, which is essential for a function of this type. For the selection of the date we must thank the seaweed of Miss D. M. Taylor, our Departmental Secretary.

The second event was the Departmental golf outing, held this year at Baberton golf course. This, regrettably, was not similarly blessed and was played in a continuous downpour. The less hardy participants were all for its cancellation, but as a result of subtle pressures from above it was decided to proceed. The winner this year was Dr. J. D. Robertson (Baberton).

North Region

The new hospital in Inverness is proceeding according to schedule and it is hoped that the first phase will be ready in about two years. Plans are ready to proceed straight on to phase two, which will include the operating theatre suites and make life easier to organise for the anaesthetic department.

Staffing remains difficult, and the Senior Registrar and Registrar posts have been converted to Medical Assistants as it is now national policy to keep all Senior Registrars in teaching hospitals. Holiday relief for Dr. Speirs in Stornoway is sometimes difficult to

obtain and any member interested in summer locum work in this most desirable area will be made most welcome.

Outside Inverness and Stornoway the anaesthetic services are run by general practitioner anaesthetists who from time to time attend courses in Inverness. It is hoped to establish such courses on a regular basis.

North-East Region

The community's apparently ever-increasing demand for hospital care is being met in this region by a phased hospital building programme on the Foresterhill site. The first phase of this development came into being in September, 1966, when the Queen Mother opened a new surgical ward block, X-ray department, and a suite of operating theatres with various ancillary facilities. This has increased the Anaesthetic Department's clinical commitments and has led to some staff increases, and the total number of anaesthetists (including trainees and some part-time anaesthetists) is now 30.

In some respects a department of this size is rather unwieldy to administer and we have been experimenting with a modified "firm-system" with several smaller semi-autonomous groups of anaesthetists responsible for the over-all anaesthetic services to specified surgical areas, the junior members moving from group to group for training purposes. The consensus at present is that the change has been beneficial.

Although (inevitably) there have been some snags noted in the new building, our anaesthetists on the whole enjoy their new working environment and welcome the presence of a well equipped recovery ward adjacent to the operating theatres. Unfortunately, the central "Special Care Unit" for the hospital, where we hope the anaesthetists will figure prominently, is not scheduled to be built until the next phase of development around 1970.

A number of members of our staff have broadened their (and the Department's) horizons by visits overseas. Dr. Rollason spent nine weeks as Visiting Professor at North-Western University, Chicago, and Dr. D. C. White visited several centres in U.S.A., and in particular examined the techniques of the Mayo Clinic Team in induced profound hypothermia with closed chest for neurosurgical vascular work. Dr. Wynn Parry is to

spend a year in Boston at the Massachusetts General Hospital, and Dr. George Robertson a year in Winnipeg with Professor Parkhouse.

Various items of research are in progress, including investigations in humidification during anaesthesia, the role of ventilators in causing respiratory tract infections following anaesthesia, the response of the isolated heart preparation to cold under various circumstances, and the place of sodium 4 hydroxy butyrate in anaesthetic practice. Dr. Parbrook's work on nitrous oxide continues. Although we regret Dr. Parbrook's departure from here, we congratulate him on his appointment as Senior Lecturer in Professor Forrester's Department at Glasgow.

Finally, we in Aberdeen have mourned the death of Dr. Thomas J. C. MacDonald, a past president of the Society, who retired from anaesthetic practice in July, 1965, after 41 years of dedicated clinical and research work in the North-East. Dr. MacDonald died on 12th October, 1966.

Eastern Region

No definite date for the opening of the new hospital at Ninewells, Dundee, can yet be given but it is expected to be 1970-71.

The Tower Extension of Dundee Dental Hospital and School has been in use for some months now. It will not be officially opened until the original hospital building has been completely refurbished. The extension, in fact, dwarfs the two parent buildings of the Dental Hospital and School.

The Department of Surgical Neurology at Dundee Royal Infirmary was opened by Professor Norman Dott on 16th September, 1966, and is now tackling the complete spectrum of standard neurosurgical procedures. It is particularly well equipped from the stand-points of anaesthesia and intensive care in both accommodation and equipment.

The University of Dundee was officially opened on 19th October, 1967, with the installation of the Queen Mother as Chancellor.

Dr. A. L. Forrest returned from a year with Dr. Bromage in Montreal in September. He takes up duties as Consultant in Dundee in November.

After many trials and tribulations there is now a Feature Card Index for anaesthetic literature established, and up-to-date, in the Department of Anaesthetics in Dundee.