

# PROGRESS IN ANAESTHESIOLOGY

PROCEEDINGS OF THE  
FOURTH WORLD CONGRESS OF ANAESTHESIOLOGISTS

London, September 9th-13th, 1968

UNDER THE PATRONAGE OF  
HER MAJESTY THE QUEEN



Editors

T. B. BOULTON  
R. BRYCE-SMITH, M. K. SYKES  
G. B. GILLET, A. L. REVELL

Co-editor

J. CLUTTON-BROCK



1970 /

EXCERPTA MEDICA FOUNDATION  
AMSTERDAM

A MESSAGE FROM HER MAJESTY THE QUEEN  
PATRON OF THE CONGRESS

I am glad that the World Federation of Societies of Anaesthesiologists decided to hold the Fourth World Congress in London and it gives me great pleasure to be Patron of the Congress. I extend a warm welcome to all who have come to London for this occasion.

The work of Anaesthetists is of the utmost importance to medicine throughout the world and the Congress will provide an excellent opportunity for the exchange of ideas in their continuous search for improvements. I am happy to recall that pioneers in Great Britain were among the first to introduce anaesthesia in the last century and that they continue to play an important part in this work.

I hope that those who have come from overseas enjoy their stay in Britain and, as Patron, I wish the Congress every success in its deliberations.

ELIZABETH R.

BUCKINGHAM PALACE

9th September, 1968

# THE WORLD FEDERATION OF SOCIETIES OF ANAESTHESIOLOGISTS

*President 1964-1968*

SIR GEOFFREY ORGANE  
Westminster Hospital, London

*Secretary*

O. MAYRHOFFER

## THE FOURTH WORLD CONGRESS OF ANAESTHESIOLOGISTS

*President*

R. P. W. SHACKLETON, C. B. E.  
Southampton

## OFFICERS OF THE CONGRESS ORGANIZING COMMITTEE

*Chairman*

GEORGE ELLIS  
St. Bartholomew's Hospital, London

*Secretary*

D. D. C. HOWAT  
St. George's Hospital, London

*Treasurer*

F. G. WOOD-SMITH  
Royal Postgraduate Medical School, London

## CHAIRMAN OF THE PROGRAMME COMMITTEE

C. F. SCURR, M.V.O.  
Westminster Hospital, London

## EDITORS

T. B. BOULTON (*Chairman*)

St. Bartholomew's Hospital, London

R. BRYCE-SMITH

Radcliffe Infirmary, Oxford

M. K. SYKES

Royal Postgraduate Medical School, London

G. B. GILLET

St. Bartholomew's Hospital, London

A. L. REVELL

Royal Naval Medical Service, London

The Editors gratefully acknowledge the co-operation of J. CLUTTON-BROCK, J. N. POWELL and R. S. CORMACK in the preparation of this Volume

## PREFACE

The Fourth World Congress of Anaesthesiologists was outstanding both because of the nature and volume of the scientific business which was transacted and as an important international occasion.

The Editors are aware that the primary purpose of publishing a volume of Proceedings is to record scientific material for future reference, but they have also endeavoured to convey something of the happy social background and the atmosphere of international harmony which, undoubtedly, pervaded the Congress. In this respect they are particularly grateful to Dr. R. B. Wright of St. Thomas's Hospital for his 'Congress Retrospect' and to the Editorial Board of the journal 'Anaesthesia' for permission to reprint it.

In arranging a volume of proceedings it is neither necessary nor desirable to follow the rigid sessional basis required for a Congress Programme. The scientific business has, consequently, been divided into Symposia, Free Papers and Films. We have, however, followed the successful scheme of grouping Free Papers which Dr. Cyril Scurr and the Programme Committee provided for the Congress and have refrained from making any alphabetical arrangement. The group of papers on 'Historical aspects of anaesthesia' has been included as an additional symposium.

The precise method of reporting the proceedings of each particular symposium has been left to the chairman or secretary concerned. The method of presentation of the Symposia is therefore not uniform, but we believe that satisfactory cover has been given to each symposium as required by its individual characteristics.

Titles such as 'Doctor' and 'Professor' and degrees have been omitted throughout the body of this volume. This is for convenience, and because of the differences in usage in various parts of the world.

The fact that the Proceedings are published in the English language should not be regarded as an arrogant gesture on the part of the English-speaking editors, but as an expression of admiration for the linguistic ability of other nations which was so manifest at the Congress.

The Editors wish to acknowledge their debt to all those who have cooperated, directly or indirectly, in the production of this volume; to the majority of the participants who handed over their manuscripts immediately after presentation; to the chairmen and secretaries of sessions and symposia; to the Registrar Stewards who so conscientiously collected the material from the speakers, to the Congress secretariat and to Mrs. Richard Green for secretarial assistance and, by no means least, to the unfailing skill and ability of the staff of the Excerpta Medica Foundation. The new version of the arms of the Association of Anaesthetists of Great Britain and Ireland which appears on the dust-cover was drawn by Mr. Peter Cull and appears by kind permission of the editors of the Association Journal *Anaesthesia*.

London, January 1970

T. B. BOULTON,  
R. BRYCE-SMITH,  
M. K. SYKES,  
G. B. GILLET,  
A. L. REVELL.

## THE OPENING CEREMONY OF THE CONGRESS

### SPEECH BY THE PRESIDENT OF THE CONGRESS

Dr. R. P. W. SHACKLETON

Her Majesty the Queen has honoured us by becoming our Patron and has sent a letter of good wishes for the success of the Congress.

We have been concerned to make this week an occasion of enjoyment and entertainment. We are also, as you will see from your programme, providing opportunity for exchange of views, for debate and even for dispute; in fact for postgraduate education. It has been said that these great international conventions serve no useful purpose. I profoundly disagree with this view. Where else and how else would so many doctors engaged in a common endeavour to advance a given branch of medicine find the opportunity for discussion with other experts in their own special field; or with those engaged in similar research or clinical practice; all in such a short period. How better to counter those attitudes of politics which seek to erect barriers limiting communication between those who follow various scientific and philosophical ideals. How better to meet those who hitherto have been merely names at the top of a paper in a scientific journal. How better to meet so many old friends and to make new ones. I hope you will re-discover the truth of what I have just said in these coming weeks, both during and after the Congress. And I hope that you will enjoy your visit to these Islands, whether this be your first visit or the latest of many.

It now devolves upon me in the absence of Her Royal Highness, Princess Alexandra, to declare open the 4th World Congress of Anaesthesiologists.

It is with great regret that we have had to tell you that Her Royal Highness, Princess Alexandra, is unable to be with us today to perform the opening ceremony of our Congress. A few days ago Princess Alexandra's mother, Princess Marina, died rather suddenly and Her Royal Highness has cancelled all her immediate engagements. Princess Alexandra is very distressed at having to make this decision. Sir Geoffrey Organe, your President, has sent a message of sympathy to Princess Alexandra on behalf of the World Federation, as also have I from this Congress.

On behalf of the Council and Members of the Association of Anaesthetists of Great Britain and Ireland I extend to you all a most cordial welcome to this country. We are delighted to see such a large gathering of anaesthesiologists from so many parts of the world and we are specially happy to see so many of your wives and families who have come with you.

In 1964 we returned from São Paulo with the invitation from the World Federation to our Association to organize the next World Congress. We accepted this honour with enthusiasm. When I cast my mind back to that time, today (9 September, 1968) seemed a very long time ahead. Those of you who have been concerned with the organization of these gatherings will know how the years between one congress and another pass as in the twinkling of an eye. It is, of course, essential to hand over the details of organization to a small group of people, and although I shall have an opportunity later in the week publicly to thank, both individually and collectively the members of our Organizing Committees, I do want at this very beginning of the week to say how grateful we are to them for having got us to the starting post. We realize the challenge of the high standards set at Scheve-

## THE OPENING CEREMONY OF THE CONGRESS

ningen, Toronto and São Paulo, as well as at the various Continental Congresses. We hope we shall not fail to meet this challenge.

### SPEECH BY THE PRESIDENT OF THE WORLD FEDERATION OF SOCIETIES OF ANAESTHESIOLOGISTS

Professor Sir GEOFFREY ORGANE

It is an accident of history that, for almost a century, anaesthetists existed only in the English-speaking countries. Anaesthesia started in the U.S.A. 122 years ago, but its early development was by medically qualified specialists who have always existed here in England. In Continental Europe and in countries which came under its influence, including the Middle East, Japan and Latin America, the all-powerful Professor of Surgery insisted on having every activity in the operating theatre under his personal control and the anaesthetics were administered by a junior member of his staff, by a nurse or by an operating theatre attendant. This attitude is still a brake to progress in many countries, though it is being overcome. It is unfortunate, from this point of view that, in the most advanced country in the world, the U.S.A., nurses form the majority of anaesthetists and that the Scandinavian countries have adopted this custom. Where anaesthetists are well established this may not do harm. To my knowledge, in Iran and also in Malaysia, the authorities have attempted to introduce nurse anaesthetists against the wishes of the anaesthetists who were already providing a service of high quality. In such countries this could only lower the standing of anaesthetists in the eyes of their colleagues and so discourage the recruitment of doctors to the specialty. In any case it doesn't make sense – there is, in such countries, a greater shortage of trained nurses than of doctors.

This apart, the change that has occurred in the last twenty-five years is remarkable and some of the credit can be claimed by the World Federation. We felt that the best way to bring about the emancipation of the anaesthetist was by encouraging the development of Societies of Anaesthesiologists in every country. Of the 26 Founder Member Societies at our first General Assembly in 1955 many were founded in the previous two or three years. Of the twenty who had joined us by 1964 and of the eleven who will be formally elected at the General Assembly later today all, except one, are newly founded.

The World Federation is strictly non-political – after all, our chief aim is to provide better anaesthesia for all peoples throughout the world. A secondary object which will further this first aim is to promote friendship and understanding between anaesthesiologists of different nations. Those of you who have attended our World and Regional Congresses have friends in every country you have visited and you have appreciated that our only concern is to improve our service to patients. In this we are not helped by the antics of politicians. For the Third World Congress Brazil was chosen, partly for its political stability. Unfortunately for us there was a change of government which meant that none of our East European colleagues was able to attend. An attempt to found a Middle East Society of Anaesthesiologists was wrecked on the question of whether Bahrain was an Arab State. I was pleased to take the chair of a panel in Athens which included an Israeli as well as Arabs – though the panel had to be seated in the front row of the auditorium instead of on the platform in case they were photographed together. Recent events in Europe have aroused much indignation and emotion. They have led to attitudes of protest. In my view, whatever our feelings as individuals, such attitudes are quite irrelevant to our work in the World Federation – our work is for mankind regardless of race, religion or political affiliation.

Our next European Congress is to be in Prague in 1970. I hope nothing will happen to prevent this and that the Czechs will feel able to welcome their colleagues from the Soviet Union, Poland, East Germany, Hungary and Bulgaria as well as the rest of us. You must

#### THE OPENING CEREMONY OF THE CONGRESS

forgive me my antipolitical outburst, but it is relevant to some items which are on the agenda for discussion at the General Assembly today.

Mr. President, on behalf of my colleagues in the World Federation of Societies of Anaesthesiologists, I would like to express our pleasure at being here; our thanks to the Organizing Committee for the excellent programmes of intellectual and social entertainment they have provided and to you as President of the Fourth World Congress and of the Association of Anaesthetists of Great Britain and Ireland for your kind words of welcome. We are determined to enjoy ourselves.

## CONGRESS RETROSPECT\*

R. B. WRIGHT

(St. Thomas' Hospital, London, England)

The fourth in the series of World Congresses under the auspices of the World Federation of Societies of Anaesthesiologists was held in London from 9–13 September 1968 under the patronage of H.M. the Queen. The Association of Anaesthetists of Great Britain and Ireland, under their President Dr. R. P. W. Shackleton, acted as hosts and delegated the detailed organization of the Congress to a small committee of its Council members.

No fewer than 2,437 anaesthesiologists from 66 countries throughout the world registered as full members; 923 wives and family members accompanied them, and in addition over 350 junior anaesthetists in training in the United Kingdom were able to attend scientific sessions at a reduced fee on a day-to-day basis – a round total of 3,770. This large and record attendance (excluding the 750 personnel of the trade and technical exhibitions) was well in excess of normal arithmetical progression from previous Congresses in the series. Nevertheless, it was largely anticipated, in view of London's central geographical position between East and West and the particular tourist attractions of the country.

For delegates, this was undoubtedly the most expensive and lavish Congress yet held, the full registration fee being £25–30 and the Organizing Committee had a budget of virtually £100,000. Although there was great disappointment at the absence of H.R.H. the Princess Alexandra, due to the death of her mother the Princess Marina a few days beforehand, the Congress got off to a good start but without undue ceremony at the opening function in the splendid Royal Festival Hall main auditorium. The welcoming addresses of the President of the Congress and the President of the World Federation of Societies of Anaesthesiologists to the crowded assembly are recorded in full elsewhere. The theme of both speakers was to remind delegates of the objects and usefulness of international congresses, and the particular aims and achievements of the parent body, the WFSA, under whose auspices the Congresses are held – a necessary affirmation for many who decry the increasingly Olympian scale and cost of these meetings and the huge burden of responsibility upon the organizers themselves.

In the event, the Congress was an undoubted overall success. Much of this stemmed from the magnificent setting of the Royal Festival Hall complex of buildings as the Congress centre itself. London – surprisingly – entirely lacks a professional Congress centre and it was indeed fortunate that the Royal Festival Hall authorities were able to accept the holding of the Congress in the only time available between their summer and autumn concert programmes, and that the recent completion of the Queen Elizabeth Hall and Purcell Room enabled all the Congress activities to take place in the same area. With the handsome and spacious interior and the incomparable views from the riverside terraces, this princely setting unquestionably set a memorable foundation for a successful week. After a disastrous summer, even the weather was kind.

Despite a quest for some originality in presentation, the content of the meeting during the five days followed in the well-established pattern of scientific congresses, with their four main components – the scientific sessions, the associated trade and technical exhibitions, the evening social entertainment and the family tours during the day.

\* By kind permission of the Editors of *Anaesthesia*.



The scientific sessions were held concurrently in the four auditoria of the Royal Festival Hall, the Queen Elizabeth Hall, the Purcell Room and the National Film Theatre. Forty per cent of the time was allocated to symposia or formalized group discussions, which seem to be an increasingly popular way of getting up to date with scientific progress and trends of modern practice, and – as expected – they were always the best attended functions. In all, some 550 delegates were able to contribute either individually or as members of panels. The academic content of these scientific sessions will be reported later in the congress proceedings. The presentation of these sessions was outstanding. The particular features were the comfortable seating and superb acoustics in the modern halls, the impeccable stewarding arrangements and the excellent programme and abstracts of the papers produced by *Excerpta Medica*.

The Royal Festival Hall building adapted itself admirably to the needs of a Congress centre, including the housing of a large trade exhibition under the same roof, which was greatly welcomed by the trade itself. 73 firms exhibited, from 12 different countries – mainly from Europe. The firms reported a larger-than-ever interest in their products, but at the time of going to press no final sales figures are available. There was an increasing emphasis on monitoring and measuring equipment.

With the attractions and amenities available at the centre itself, perhaps fewer delegates than usual accompanied their wives on the day tours, which ranged from visits to the Stock Exchange, Silver Vaults, fashion shows and other traditional sights within London, to longer trips into the country. The tours in greatest demand were those visiting Oxford and Cambridge. Despite the elaborate plans so excellently organized by the Ladies' Committee, many trips had to be duplicated at the last minute to fulfil demands.

The problem that gave the organizing committee perhaps the greatest headache was to provide entertainment during the evenings for this large number of some 3,500 people. It was impossible to find a suitable venue in London for a single conventional reception on the Monday evening and delegates had to be divided into groups of 200–500. Invitations were gratefully received from H.M. Government at Lancaster House, the Wellcome Institute, the Royal Society of Medicine, the Royal College of Obstetrics and Gynaecology and the University of London.

Even the combination of the Royal Festival Hall and the Queen Elizabeth Hall was insufficient to avoid a duplication of the planned highlight of the week, which was held both on Tuesday and Wednesday. The choice of either a concert by the English Chamber Orchestra or a film of *Romeo and Juliet* danced by the Royal Ballet formed a prelude to a splendid firework display from the river and the ceremony of Beating Retreat by the Coldstream Guards, to be watched from the open terraces of the halls. A torrential shower unfortunately modified the full enjoyment of this climax.

There was a widespread desire among anaesthetists in London to offer as much private and personal hospitality as possible to overseas visitors. This was difficult to arrange because of the large numbers involved, so that in addition to various private parties larger groups were successfully entertained by hospitals in the London area on Thursday evening.

The traditional final ball on Friday, again, had to be split between the Dorchester, Grosvenor House, and the London Hilton hotels, and speeches were restricted to a note of farewell by the President of the Congress and the introduction of the new president of the WFSA, Dr. Foldes, and the announcement that the next Congress would be in Tokyo.

A most pleasing ceremony took place at the Royal College of Surgeons before an invited audience on 11 September 1968 during the Congress. The Dean of the Faculty opened the proceedings and invited the President of the Royal College of Surgeons, Professor Sir Hedley Atkins, to give an address. After this Professor Sir Robert Macintosh was admitted to the Honorary Fellowship in the Faculty of Anaesthetists and the following distinguished overseas anaesthetists were admitted to the Fellowship by election: Mary Taylor Burnell (Adelaide), Markham Sydney Chayen (Tel-Aviv), André Jacques (Quebec), Marion Thomas Jenkins (Dallas), Eusebio De Sousa Lopes-Soares (Lisbon), Otto Mayrhofer (Vienna), Henning Christian Poulsen (Aarhus), Leonard Thomas Shea (Sydney), Pritam Singh (Amritsar), Isaak Solomonovich Zhorov (Moscow).

With the knowledge that such an international gathering of anaesthetists would not return to this country in the lifetime of most of us, it was tempting to take the opportunity

## CONGRESS RETROSPECT

to publicize the scope and activities of modern anaesthesia which might be of interest to the lay public. The novel method chosen was to present to a daily formal press conference certain topics selected for their public interest rather than because they reflected subjects representing the academic discussions of the conference itself. The subjects were each presented by experts attending the Congress and included definition of death, intensive therapy, dental anaesthesia, the world shortage of anaesthetists and painless childbirth. The press were delighted with this method of presentation of news and, apart from one regrettable piece of ill-reported sensationalism, produced considered columns in all sections of the daily press.

The compliments and lack of complaints reaching the Association of Anaesthetists concerning the splendid organization of the whole meeting have rewarded the three and a half years steady toil of the Organizing Committee, not least our professional guide and secretary, Miss P. R. Cridland.

### WHAT THE PAPERS SAID

The activities of anaesthetists and the World Congress appear to have been mentioned at least 143 times in the British Press. Pride of place for an extensive, accurate and factual survey of anaesthesia goes to the *Financial Times*, 9 September, which devoted no less than four whole pages to the specialty. The Congress was mentioned in general terms less than half a dozen times, although there were at least ten other references to receptions, exhibitions and other features. Nearly half the references concerned the 'transplant/vulture' theme, often with striking headlines. The next commonest subjects were epidural analgesia in obstetrics, Professor Beecher's comment that it was a waste of time to keep some patients alive and 'Dangers in the Dentist's Chair' – clearly all subjects likely to stir the public imagination.

## THE CONGRESS ORGANIZATION

*President of the Congress*  
R. P. W. SHACKLETON, CBE

*Organizing Committee appointed by the  
Association of Anaesthetists of Great Britain and Ireland*

Chairman: GEORGE ELLIS	Vice-Chairman: C. B. LEWIS
Treasurer: F. G. WOOD-SMITH	Secretary: D. D. C. HOWAT
A. J. W. BEARD	T. B. BOULTON
G. E. HALE ENDERBY	P. J. HELLIWELL
S. A. MASON	C. F. SCURR
	O. P. DINNICK
	R. JARMAN
	R. B. WRIGHT

### *Scientific Programme*

Chairman: C. F. SCURR  
T. B. BOULTON  
C. M. CONWAY  
S. FELDMAN  
P. HANSELL  
D. D. C. HOWAT  
J. G. ROBSON

### *Finance*

Chairman:  
F. G. WOOD-SMITH  
GEORGE ELLIS  
D. D. C. HOWAT

### *Registration*

C. B. LEWIS

### *Site Arrangements*

R. B. WRIGHT

### *Steward Organization*

T. B. BOULTON  
R. MARSHALL

### *Press*

H. C. CHURCHILL-DAVIDSON

### *Scientific Exhibition*

Chairman: I. R. VERNER  
O. P. DINNICK  
P. J. BENNETT  
S. LEESON

### *Publications and Proceedings*

Chairman: T. B. BOULTON  
R. BRYCE-SMITH  
M. K. SYKES  
G. B. GILLETT  
A. L. REVELL

### *Social Programme*

Chairman: S. A. MASON  
Mrs. O. P. DINNICK  
GEORGE ELLIS  
D. D. C. HOWAT  
R. B. WRIGHT

### *Technical Exhibition*

Chairman: G. E. HALE ENDERBY  
O. P. DINNICK  
I. R. VERNER  
Miss B. I. BERMON/*SIMA Medical Instrument Group*  
M. J. DRUCE/*M. J. Druce Export Services Ltd.*  
L. A. GREALEY/*F. W. Clifford Ltd.*  
M. C. HARDIE/*King's Fund Hospital Centre*  
K. LINTON/*Association of British Pharmaceutical Industry*  
R. A. NUNN/*British Surgical Trades Association*  
F. D. OUTRIDGE/*Scientific Instrument Manufacturers' Association of Great Britain*  
C. E. STONE/*Ministry of Health*

### *Associate Members Programme*

#### *Ladies' Committee*

Chairman: Mrs. O. P. DINNICK

Mrs. B. A. SELICK  
Mrs. D. D. C. HOWAT  
Mrs. B. JOHNSON  
Mrs. C. B. LEWIS  
Mrs. R. L. LLOYD-JONES  
Mrs. S. A. MASON  
Mrs. W. K. PALLISTER  
Mrs. M. K. SYKES  
Mrs. F. G. WOOD-SMITH

THE CONGRESS ORGANIZATION

*Interpreters*

*Consultant Interpreter*

Mr. A. PILLEY

*Team of Interpreters*

Mrs. BIEHL

Mr. M. GARCIA

Mr. P. HORSTRUP

Mrs. A. JACKSON

Miss H. LUND

Mrs. I. TESTOT-FERRY

Mrs. M. L. UPTON-JACOBY

Mr. D. WEISSBEIN

*Secretariat*

*Congress Organizer*

Miss P. R. CRIDLAND

*Senior Secretary*

Miss E. V. JONES

Miss E. COLES

Mrs. J. GROGONO

Miss P. BAKIOS

Miss A. STRINGER

*Auditors*

Messrs. BALL, BAKER, DEED  
& Co.

*Banker*

Westminster Bank Ltd.

*Designer*

SHEILA DONALDSON WALTERS

*Legal Advisers*

Messrs. HEMPSONS

## THE WORLD FEDERATION OF SOCIETIES OF ANAESTHESIOLOGISTS

Two general assemblies were held during the Congress on Monday 9th September and Thursday 12th September 1968.

*The Election of the President.* Dr. Francis Foldes, chief of the Division of Anaesthesiology at Montefiore Hospital and Medical Centre in the Bronx, New York, U.S.A., was elected president of the Federation for the period 1968–1972 in succession to Sir Geoffrey Organe.

*The Election of Officers.* Professor O. Mayrhofer, Austria, was re-elected as secretary, and Professor Quintin J. Gomez, Philippines, succeeded Professor H. Poulsen, Denmark, as Treasurer.

*Admission of New Member Societies.* The Societies of the following countries were admitted or re-admitted to membership: Ceylon, Cuba, Egypt, German Democratic Republic, Guatemala, Hungary, Indonesia, Kuwait, Malaysia, Poland, Rumania, Singapore, Syria, U.S.S.R., West Africa.

During the Congress the President of the Association of Anaesthetists of Great Britain and Ireland (Dr. R. P. W. Shackleton) presented a flag bearing insignia of the World Federation of Societies of Anaesthesiologists to the President (Sir Geoffrey Organe) with the request that it be flown at subsequent World Congresses.

## TABLE OF CONTENTS

Preface . . . . .	ix
The Opening Ceremony . . . . .	x
Congress Retrospect . . . . .	xiii
The Congress Organization . . . . .	xvii
The World Federation . . . . .	xix

## SYMPOSIA

### SYMPOSIUM 1: ANAESTHESIA AND CIRCULATORY PERFUSION

A Report by the Chairman . . . . .	1
------------------------------------	---

### SYMPOSIUM 2: COMPUTER APPLICATIONS IN ANAESTHESIOLOGY

T. W. MURPHY and V. D. B. MAZZIA: Computer monitoring in anaesthesia and intensive care . . . . .	9
J. WELDON BELLVILLE and J. VON DER GROEBEN: Servo-control of anaesthesia (Abstract). . . . .	14
M. TIENGO: Hydraulic computers (Abstract) . . . . .	14
J. O. HAGELSTEN: Computer registration of anaesthesiological data . . . . .	15
J. A. THORNTON: Some applications of analogue computers to teaching . . . . .	17
O. P. NORLANDER, G. WILLIAM-OLSSON, I. NORDÉN and S. O. PETTERSSON: Integrated display system for patient data monitoring . . . . .	24

### SYMPOSIUM 3: PAEDIATRIC ANAESTHESIA

R. M. SMITH: The development and future of paediatric anaesthesia (No manuscript available). . . . .	—
L. DIGBY: The scope of paediatric anaesthesia (No manuscript available) . . . . .	—
J. DOWNES: Aspects of paediatric pharmacology (No manuscript available). . . . .	—
G. H. BUSH: Relaxants in neonates and infants. . . . .	35
T. J. V. VOSS: Anaesthetic management of infants undergoing emergency cardiac surgery . . . . .	39
D. ALLAN: The anaesthetic management of posterior fossa explorations in infants. . . . .	42
T. BROPHY: The anaesthetic management of head injuries in children . . . . .	46

### SYMPOSIUM 4: NEUROSURGICAL ANAESTHESIA

Introduction . . . . .	51
M. MARRUBINI BOZZA: The basic requirements of neurosurgical anaesthesia . . . . .	52
F. G. FREUND: The relevant physiology. . . . .	56
E. GORDON: The action of drugs on the intracranial contents . . . . .	60
G. F. BRINDLE: Special problems of patients with head injuries . . . . .	69

## TABLE OF CONTENTS

M. KEÉRI-SZÁNTÓ: Anaesthesia for spinal surgery. General comments, haemodynamic and metabolic studies . . . . .	81
T. V. CAMPKIN: Hypothermia for neurosurgical operations . . . . .	85
J. M. HORTON: Anaesthesia for intracranial radiological procedures . . . . .	88
Discussion . . . . .	91
SYMPOSIUM 5: ASSISTED VENTILATION IN THE NEWBORN	
S. SEGAL: Artificial ventilation in the newborn. Organization of the service . . . . .	99
G. J. REES: The techniques of applying artificial ventilation . . . . .	104
J. B. OWEN-THOMAS: Various aspects of the pathophysiology of artificial ventilation . . . . .	107
S. A. SWENSSON: Physiological control of intermittent positive pressure ventilation in the newborn . . . . .	111
L. OKMIAN: Physiological control of intermittent positive pressure ventilation in the newborn . . . . .	113
Discussion . . . . .	115
J. J. DOWNES: Management of respiratory failure in the newborn requiring surgery . . . . .	116
H. DE V. HEESE: Artificial ventilation in the newborn: Results . . . . .	121
SYMPOSIUM 6: COMMUNICATION IN ANAESTHESIA	
Introduction . . . . .	131
M. T. JENKINS: Towards a unified terminology in anaesthesia. . . . .	132
H. F. POPPELBAUM: The language barrier . . . . .	135
J. E. RIDING: The language barrier . . . . .	137
M. S. CHAYEN: The value of national and international conferences . . . . .	140
K. A. ODURO: Communication between the old countries and the new . . . . .	142
J. JACOBY: The new approach to teaching anaesthesia . . . . .	144
W. W. MAPLESON: Communication between the scientist and the clinical anaesthetist . . . . .	147
G. J. VAN WEERDEN: Communication between anaesthesia and other fields of medicine . . . . .	150
W. H. FORREST JR. and J. P. BUNKER: The future of international computational communication . . . . .	153
P. W. THOMPSON: Nomenclature and terminology . . . . .	157
Discussion . . . . .	159
SYMPOSIUM 7: HISTORICAL ASPECTS OF ANAESTHESIA	
O. SECHER: The introduction of anaesthesia into Denmark . . . . .	165
O. V. S. KOK: History of anaesthesia in the Republic of South Africa . . . . .	167
G. WILSON: William Russ Pugh of Van Diemen's Land . . . . .	174
M. C. D'ALMEIDA and D. G. MEIRA: Anaesthesia in Brazil . . . . .	179
O. P. DINNICK: The first anaesthetic society. . . . .	181
C. D. T. JAMES: The contribution of Sir William Macewen to anaesthesia . . . . .	187
D. SOBAN: The origin of scopolamine . . . . .	193
R. M. A. MCCLELLAND: The history of tracheostomy . . . . .	195
R. S. ATKINSON: The 'lost' diaries of John Snow . . . . .	197
SYMPOSIUM 8: DEVELOPMENT OF ANAESTHETIC APPARATUS	
F. F. CARTWRIGHT: Thomas Beddoes and James Watt . . . . .	203
W. D. A. SMITH, K. SIEBOLD, M. D. HARGREAVES and A. PEGG: The development of nitrous oxide anaesthesia and a comparison of anaesthetic techniques. . . . .	208
A. M. BETCHER: History and development of anaesthetic liquid vaporizers . . . . .	214

## TABLE OF CONTENTS

J. B. STETSON: History of the development of equipment for paediatric anaesthesia	222
J. W. C. FOX and E. J. FOX: The Waller chloroform balance revisited	225
Discussion	227
 SYMPOSIUM 9: THE VENTILATION REQUIREMENT	
A Report by the Chairman	235
 SYMPOSIUM 10: PAIN	
J. J. BONICA: Management of intractable pain. Basic principles	245
B. FINER: Hypnosis and other psychological methods in pain therapy	252
H. K. BEECHER: Milestones in the study of pain	257
P. W. NATHAN and M. C. SMITH: Neurosurgical methods of treating pain in cancer	263
G. MORICCA: The management of cancer pain	266
M. SWERDLOW: The relief of intractable pain	270
E. CIOCATTO: The management of trigeminal neuralgia	274
W. H. DAM: The treatment of musculoskeletal pain syndromes	276
I. GRUNWALD: Visceral pain	278
J. MADRID ARIAS: Myofascial pain syndromes	281
E. M. FIGALLO: Causalgia and other reflex sympathetic dystrophies	283
B. E. DWYER: Pain therapy in Australia	285
 SYMPOSIUM 11: TOXIC EFFECTS OF ANAESTHETICS	
F. MOYA: Toxicity of local anaesthetics in the foetus and newborn following paracervical block	291
A. ÅSTRÖM: Toxic effects of local anaesthetic agents	293
G. CORSEN: Toxic effects of halogenated anaesthetics in healthy and nutritionally deprived human liver cells	297
D. W. EASTWOOD: Toxicity of anaesthetics to leucocytes	305
B. R. FINK and W. E. SIMPSON, III: Cellular metabolic depression by volatile, barbiturate and local anaesthetics	309
R. GREENBAUM: The toxicity of the higher oxides of nitrogen	313
G. D. PARBROOK: Nitrous oxide toxicity	316
B. E. SMITH: Teratogenicity of inhalation anaesthetics	319
B. R. J. SIMPSON, L. STRUNIN and W. D. WALKER: The effects of chloroform and halothane on an isolated canine liver perfusion preparation	324
M. M. AIRAKSINEN: Toxicity of the metabolites of halothane	326
Discussion	330
 SYMPOSIUM 12: MONITORING IN ANAESTHESIA	
H. S. WOLFF: Patient monitoring – A boon or a burden?	337
O. SECHER: The use of monitors in anaesthesia and intensive care units	340
P. J. GAUTHIER-LAFAYE and L. LARENG: Pitfalls and dangers of monitoring	342
M. LÜDER and CH. BENSOW: Continuous monitoring of the respiratory minute-volume using the Ventitrol	346
P. J. POPPERS: Blood pressure monitoring by ultrasonic kine-to-arteriography	353
D. W. HILL, J. P. PAYNE and J. F. CRUL: Patient monitoring by telemetry	361
Discussion	363
 SYMPOSIUM 13: PHARMACOKINETICS OF VOLATILE ANAESTHETIC AGENTS	
R. M. FEATHERSTONE, E. ROTHSTEIN and S. HEGEMAN: Solid state biology. Dis-	



# TABLE OF CONTENTS

cussion of macromolecular systems of importance to the behaviour of anaesthetic agents . . . . .	369
W. W. MAPLESON: The uptake and distribution of inhaled anaesthetics - The broad picture . . . . .	375
M. B. CHENOWETH, E. F. DOMINO and R. A. VAN DYKE: The distribution and metabolism of volatile anaesthetic agents . . . . .	382
I. C. GEDDES, L. C. MARK, L. BRAND and M. FINSTER: Radiobromine studies of halothane . . . . .	388
H. YAMAMURA: The effect of ventilation and blood volume on the uptake and elimination of inhalation anaesthetic agents . . . . .	394
E. I. EGER, II: Implications of some simple concepts of partition coefficients . . . . .	400
E. M. PAPPER: Uptake of volatile anaesthetic agents in infants and children . . . . .	405
SYMPOSIUM 14: MUSCLE RELAXANTS	
Introduction . . . . .	409
E. N. COHEN and S. A. FELDMAN: The distribution and elimination of non-depolarizing muscle relaxants . . . . .	410
The Chairman's tribute to Professor V. A. Kowanew, Moscow . . . . .	415
V. A. KOWANEW, F. F. BELOJARZEV and J. M. KCHMELEVSKY: Clinical and electromyographic analysis of the action of succinylcholine . . . . .	416
J. F. CRUL: Studies on new steroid relaxants . . . . .	418
F. F. FOLDES: Regional intravenous neuromuscular block: A new diagnostic and experimental tool . . . . .	425
T. C. GRAY: The mechanism of reversal of non-depolarizing relaxants . . . . .	431
R. L. KATZ and W. FLACKE: Neuromuscular effects of gerrmine diacetate in cat and man . . . . .	437
SYMPOSIUM 15: PAEDIATRIC INTENSIVE CARE	
J. B. OWEN-THOMAS: The scope of paediatric intensive care . . . . .	445
J. G. STOCKS: Prolonged endotracheal intubation in paediatric intensive care . . . . .	447
W. J. GLOVER: Tracheostomy in the intensive care of infants . . . . .	451
J. B. STETSON: Possible causes of tissue toxicity of endotracheal and tracheostomy devices . . . . .	455
A. W. CONN: The role of inhalation therapy in the intensive care unit (No manuscript available) . . . . .	—
D. ALLAN: A new approach to ultrasonic mist therapy in children . . . . .	458
J. S. INKSTER: Ventilators for paediatric use . . . . .	467
SYMPOSIUM 16: INTENSIVE THERAPY UNITS	
A Report by the Chairman . . . . .	477
SYMPOSIUM 17: EDUCATION, TRAINING, AND QUALIFICATIONS IN ANAESTHESIOLOGY	
Introduction . . . . .	495
M. H. HARMEL: A review of problems of education in anaesthesiology . . . . .	496
Introduction . . . . .	499
Q. J. GOMEZ: Planning undergraduate teaching in anaesthesia in a new medical school . . . . .	500
Introduction . . . . .	502
A. GANENDRAN: Undergraduate training in anaesthesia in the new medical school of the University of Malaya . . . . .	503
W. D. WYLIE: The concept of training of anaesthetists in the British National Health Service . . . . .	505