The 1914-1918 War

In the reading necessary for compilation of a bibliography of references to anaesthesia and related subjects in *Australian Medical Journals* 1846-1962, it became plain that each of the major wars in this period had been prominent "links in the chain" of contribution to the development of anaesthesia and resuscitation. If this seems a morbid statement in view of the carnage and human suffering involved in war, we should look again; and this time consider the huge numbers of lives saved in peace because of the lessons learned in war.

Any major disaster, be it earthquake, bushfire, flood, terrorism or war, provides large numbers of injured and shocked people who thankfully do not exist in normal life; therefore, in the lessons learned, there is benefit and development which to a certain extent offset the tragedies, and it is some solace that people did not die in vain.

Let us review the medical background relevant to World War I. Radiography and the aseptic treatment of wounds made a great difference in medical treatment in the Boer War, but in that war many thousands died of typhoid fever and malaria—not wounds. By 1914 advances in bacteriology, pathology and biochemistry were almost able to cope with those diseases, so that serious outbreaks were unknown in World War I. The work of Crile of America on shock and surgery in 1899 had alerted the medical world to the necessity of dealing with this condition, even though from reading numbers of papers it is obvious that there was considerable discussion all over the world about the actual mechanism and physiology of shock.

The medical world as a whole, by 1914, was well aware of blood groups and the dangers of incompatibility; yet to come, but almost there, was citrate as an anticoagulant and therefore the possibility of preserving blood and transporting it, which, as the war years went by, revolutionised both resuscitation with blood and the apparatus for its administration.

Dedicated men were busy devising suitable apparatus (and improving on their inventions) for the use of nitrous oxide in anaesthesia, a feature of development which was to prove important in the war years. The administration of open ether, which required no cumbersome apparatus to be transported, had come to stay, as had ethyl chloride, which enabled rapid induction or could be used alone for minor wound treatment.

Local anaesthesia and its development, nerve block, also took a prominent place with large numbers to be treated as quickly as possible. Available also was anti-tetanic serum, used prophylactically for the first time in large amounts, which gave needed safety for those wounded in the field and avoided disasters of previous wars.

It is hardly surprising to find that most articles describing medical treatment on the various battlefronts appeared in the journals of 1919. Twelve hours on duty and twelve hours off (in theory) were constant in action, left little time to prepare papers, for if the action took place in a further part of the line, unoccupied advance station medical officers reported to the nearest Casualty Clearing Station.

Colonel J.L. Purdy, quoting a Colonel Bruce Skinner at the Australasian Medical Congress in New Zealand in 1914, states "Evacuation of the sick and wounded is the crux of the medical problem in war" and most of the recapitulations of the medical service in World War I refer to this problem, for it involved the new knowledge of shock and intravenous resuscitation and the great developments in this area during this war. It was in this area that the Australian army made a significant contribution.

The use of motor ambulances, rather than bearers, for transport of the wounded from field to Advance Dressing Station (ADS), then to Main Dressing Station (MDS) and thence to Casualty Clearing Station (CCS) (the latter usually some fifteen to twenty miles behind the lines) had made a significant difference to the speed with which the wounded reached these posts, but since ADS and MDS moved forward behind attacking battle action, the wounded could not remain in them for long, and in a severe action they rapidly became overcrowded. Even temporary treatment was impossible for many, and it was found that it was during periods of waiting at ADS and MDS that wound shock developed (Illness) which was exacerbated by the long ride to the CCS. Attempts were made to combat this situation by setting up intravenous drips of saline (with additions such as gum arabic) at the ADS and MDS, to be followed by blood transfusion at the CCS, but in view of the waiting periods this was still not entirely satisfactory.

By 1918 it had been discovered that with wound debridement primary suturing of wounds could be performed in many cases, and that in others the application of chemically treated pads to the wound before transport prevented much infection, but there was still delay and congestion both at the advance stations and the CCS, especially if anaesthesia was used and a recovery period necessary. Earlier in the war nitrous oxide became the anaesthetic of choice, with its fast induction and rapid recovery, enabling almost immediate transport of wide awake patients.

These developments enabled the formation in June, 1918, of a purely Australian innovation; the "Field Ambulance Resuscitation Team." These teams were established throughout the Australian divisions and the concept was later adopted by Canadian and American forces.

To quote the description given by Butler of this development,

Consumption: The Australian Resuscitation Teams.

Towards the end of June officers

Continued on Page 4
1996 Annual Meeting and Dinner

This year's Annual Meeting and Dinner of the Anesthesia History Association will be held on Tuesday, October 22, 1996, in the Terrace Room of the Westin Canal Plaza, Canal Street, New Orleans. This dinner, an annual event held during the yearly meeting of the American Society of Anesthesiologists, features a No-Host Social Hour at 6:30 p.m., followed by a short business meeting and then dinner at 7:30 p.m.

The First Calverley Memorial Lecture, honoring one of the founders of the AHA, Roderick Calverley, M.D., will be given by Selma H. Calmes, M.D. She will speak on *The Economic History of Anesthesia*.

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**Essays on History of Anesthesia**

A volume of essays on the history of anesthesia is being prepared by Drs. Tom Boulton and David Wilkinson and will be published in time for the 150th anniversary of the introduction of clinical anesthesia in October, 1996. It will be one of the Royal Society of Medicine's International Congress and Symposium series. Copies of this volume at a cost of $32.50 U.S.A., including postage, may be obtained by writing a check to the History of Anesthesia Society and mailing to Dr. C.N. Adams, 118 Appledown Drive, Bury St. Edmunds, Suffolk IP32 7HQ, Great Britain.

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**British Celebration of Anesthesia Sesquicentennial**

The Association of Anaesthetists of Great Britain and Ireland, The History of Anaesthesia Society, and The Sections of Anaesthesia and History of Medicine of the Royal Society of Medicine invite all members of the Anesthesia History Association to a one-day gala celebration of 150 years of the use of Ether and Chloroform in anesthesia on Thursday, January 16, 1997, in the Mountbatten Suite of the Queen Elizabeth II Conference Center in Westminster, London.

Further information may be obtained by writing to Dr. J.A. Bennett, FRCA, Department of Anaesthesia, Frenchay Hospital, Bristol BS16 1LE, Great Britain.

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**History of Anesthesia and Related Fields in Philately**

*by Miguel Calón-Morales*

This Postage stamp was issued in honor of the Doctors of America in 1947.

The central design is a reproduction of the painting "The Doctor" by Sir Luke Fildes. Although Sir Luke Fildes pictures the primary physician of many years ago, it may represent also, symbolically, the anesthesiologist of today and tomorrow as a perioperative physician with his/her continuous VIGILANCE before, during and after anesthesia is administered.

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**Errata**

Dr. David J. Wilkinson in his paper, "Nitrous Oxide in the 1920s and 1930s," (Vol. 14, No. 1, January, 1966) points out that erroneously he attributes Lundy to be associated with the development of tracheal tubes. He correctly does associate this development to Waters and Guedel.

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**PAUL M. WOOD FELLOWSHIP AWARDS**

The Wood Library-Museum of Anesthesiology (WLM) each year offers four Fellowship Awards to residents in training in anesthesiology, physicians in other disciplines, historians, graduate students of the history of medicine and other individuals with a developed interest in library and museum research.

Prospective candidates may request application information from Mr. Patrick Sim, Librarian; Wood Library-Museum of Anesthesiology; 520 N. Northwest Highway; Park Ridge, IL 60068-2573. The completed application should be returned to Mr. Sim with a current curriculum vitae, reprints of no more than five prior publications and a research proposal not exceeding eight double-spaced pages. Four copies of the application and each supporting document should be returned before January 31, 1997. All applications will be judged by a committee of the Board of Trustees of the WLM. The Fellowships will be awarded before April 1, 1997.

Fellows will receive a grant of $500.00 to support their work at the WLM or elsewhere. In addition, individuals who must travel more than 100 miles to the WLM will receive funds equal to one round-trip economy class trip by air to and from their residence. Fellows who are obliged to stay near the WLM during the term of their Fellowship shall be eligible for per diem support of $125.00 for a period not to exceed fifteen working days.

The WLM Librarian will supervise the Fellow's use of the facilities and will provide an office or appropriate working space. Archival material selected for duplication will be reproduced without cost by the library staff. The Board of Trustees require that a Fellow present the Librarian with copy of any manuscript that incorporates information gained during the course of the Fellowship.
Anesthesia and Medical History on the Internet

by A. J. Wright, MLS, Department of Anesthesiology Library, School of Medicine, University of Alabama at Birmingham

NOTE: Additions and corrections are welcome!

Anesthesia

- anes-hist  Launched in July, 1995, anes-hist is an electronic discussion list devoted to the history of anesthesia, pain management, critical care medicine and related topics. List owners are Keith J. Ruskin, MD (ruskin@gasnet.med.yale.edu) and A. J. Wright, MLS (meds002@uabdpd.dpo.uab.edu); there are some 140 subscribers as of 3/96. To subscribe, send the message "subscribe anes-hist your name" [without the quotes] to listproc@gasnet.med.yale.edu

- American Association of Nurse Anesthetists. Email address. Archivist: Lee C. Fosburgh, MLIS, MA (fosburg@nslslis.org)


- American College of Veterinary Anesthesiologists. History. URL: http://www.cvm.okstate.edu/~ACVA

- Chelsea and Westminster Hospital. Magill Department of Anaesthetics. History. URL: http://www.cxwms.ac.uk/ACADEMIC/ANAES/mdahome.html

- Hinckley’s Who Was Who on Ether Day (Boston Medical Library) URL: http://www.med.harvard.edu/programs/anesthesia/history.html

- History of Anaesthesia Society, Great Britain. URL: http://www.ncl.ac.uk/~nanae/spec.html

- History Pages, Dutch Anesthesiology Corner. URL: http://web.inter.nl.net/bcc/Stef.Olofsen.Post Note: Currently contains the essay “Some Thoughts on the History of Anaesthesia,” by Dr. David Zuck

- Wood Library-Museum of Anesthesiology. Email addresses. General: wlm@asahq.org Patrick Sim, MLS: p.sim@asahq.org Sally Graham, MLS, MA: s.graham@asahq.org

- University of Alabama at Birmingham. Dept. of Anesthesiology. Gopher Server URL: gopher://gopher.anes.uab.edu Anesthesia History Menu: This subsection of the gopher site contains a number of files related to the history of anesthesia, including literature searches on nitrous oxide, ether and chloroform and an annotated selection of recent articles

- Educational Synopses in Anesthesiology and Critical Care. Anesthesia History Column. This electronic peer-reviewed journal, distributed free via the Internet, includes a history column in each issue. If you would like to submit, contact A. J. Wright, MLS (meds002@uabdpd.dpo.uab.edu), Anesthesia History Contributing Editor.

- Virtual Museum of Anesthesiology. URL: http://umdas.med.miami.edu/ett/vma/vmahome.html Curated by Carlos M. Nunez, MD (cnunumd@aol.com), this site is based at the University of Miami Department of Anesthesiology. As of 2/96, the site contains only a collection of portraits of historical figures, but collections of historical articles, reference materials and materials related to machines and other equipment are planned.


Medical History

- CADUCEUS-L Established in May, 1992, this electronic discussion list is devoted to the history of medicine. Moderated by Inci Bowman, PhD (jbowman@beach.utmb.edu), the list has about 650 subscribers as of 2/96. To subscribe, send the message “subscribe CADUCEUS-L” [without the quotes] to mailserve@beach.utmb.edu

- Center for the Study of the History of Nursing. Email address. Curator: Margo Szabunia, Curator (nhistory@pobox.upenn.edu)

- Alan Mason Chesney Medical Archives. Johns Hopkins Institutions. URL: http://www.med.jhu.edu/medarchives/awelcome.htm


- American Association for the History of Nursing URL: http://users.aol.com/nsghistory/AAHN.html Email: nsghistory@aol.com

- Bakken Library and Museum (Minneapolis, Minn.). URL: http://www.umn.edu/nhhome/m557/these001/blm/welcome.htm

- Blocker History of Medicine Collections. University of Texas Medical Branch. URL: http://www.utmb.edu/mml/blocker.htm Online Catalog URL: http://ils.library.tmc.edu

- Countway Library of Medicine, Harvard University. URL: http://www.med.harvard.edu/countway

- Florence Nightingale Collection. Kansas University Medical Center. Clendening Medical Library. URL: http://www.kumc.edu/service/clendening/florence/florence.html

- Historical Medical Tour of Galveston, Texas URL: http://www.utmb.edu/galveston/universities/utmb/mml/hms.html

- Institute of the History of Medicine. Johns Hopkins University. URL: http://www.welch.jhu.edu/history/IOHMhome.html

- Lane Medical Library Special Collections and Archives. Stanford University URL: http://www-med.stanford.edu/MedCenter/Lane/SpecColl/home.html

- Massachusetts General Hospital History of Neurosurgery Home Page. URL: http://neurosurgery.mgh.harvard.edu:80/history.htm

- Medical Humanities WWW Site. History of Medicine syllabi. URL: http://mchip00.med.yu.edu/1it-med/syllabi. for.web/syllabi.menu.page.html

- Michigan Historical Center for the Health Sciences. URL: http://http2.lib.umich.edu/HCHS/


- New York Academy of Medicine Library. Historical Collections. URL: http://www.nyam.org/library/about.html Email: history@nyam.org

- Prior Health Sciences Library, Ohio State University. Medical Heritage Center. URL: http://bones.med.ohio-state.edu/heritage/heritage.html

- Reynolds Historical Library. University of Alabama at Birmingham. URL: http://www.lhl.uab.edu/80/reynolds

- Scientific and Medical Antigue Collecting System, Duke University. URL: http://
of the 4th Field Ambulance took the initiative in applying this new line of treatment to field ambulance work. The matter was brought to a head by the occurrence of several unfortunate happenings. The following created a deep impression.

On June 24th, at Daours, the ADMS, 4th Australian Division (Colonel A.H. Moseley) was wounded in the leg by a fragment of H.E. He was evacuated to the MDS (4th Field Ambulance) at Les Alencons where under existing conditions no effort could be made to ligate the posterior tibial artery, which had been severed in its upper third. Evacuation to CCS at Crouy (18 kilometres) over bad roads involved several more hours before effective surgical aid was possible—and this when the division was holding a quiet front. The limb had eventually to be amputated.

With the approval of the ADMS and concurrence of the Deputy-Director of the Officer Commanding the 4th Field Ambulance (Lieut-Colonel R.S. McGregor) there now formed, unofficially, a “resuscitation team”, directed by Major A.W. Holmes a Court. Equipment in blood transfusion was obtained by various devices: serum for the typing of donors, gum and glucose solution, and so forth were supplied by No. 3 (British) CCS. The “team” was ready to undertake urgent surgical work in time for the Battle of Hamel; and during this action and subsequently it was kept fully employed at the MDS at Les Alencons.

Early in July General Howse visited the Australian Corps, and unofficially approved the scheme.

Also in Butler’s book is a report prepared on the work of these teams, presented on October 14, 1918, which lists the equipment details.

President—Major A.W. Holmes a Court, a/D.A.D.M.S.


Work of the teams since their inauguration was discussed and the appended report forwarded.

Major Gordon-Taylor expressed appreciation of the work done and has furnished a special report (q.v.).

Report of the Committee: A Surgical Resuscitation Team has recently been formed in each division of the Australian Corps for the purpose of performing urgent surgical work and resuscitation in the forward area.

This has proved an effective means of treating many seriously wounded men otherwise difficult to deal with efficiently.

Under the present conditions of warfare considerable time must inevitably elapse before a seriously wounded man can receive adequate attention at the C.C.S. This delay frequently involves loss of life or limb unless the case receives efficient early treatment at the Main Dressing Station.

The class of cases particularly involved includes:

i) shattered limbs

ii) injuries to blood vessels involving the use of tourniquets

iii) cases of severe shock or haemorrhage

A team consists of two medical officers—one proficient in war surgery, blood transfusion etc., another expert in administration of nitrous oxide oxygen anaesthesia and in general resuscitation together with an N.C.O. and three orderlies who receive special training in this work at C.C.S.

A team is attached to a Field Ambulance in each division and is completely mobile, moving with its equipment to A.D.S. or M.D.S. in a large Motor Ambulance Car.

Operative work is restricted to necessary surgical procedures, ligatures of arteries, urgent amputations etc.

Resuscitation is effected by transfusion of blood from donors carefully selected from lightly wounded cases, injections of gum, sod. bicarb and glucose solution, etc. and rechauffement.

Many limbs were saved by the early removal of tourniquets and it is found that severely shocked patients arrive at C.C.S. in much better condition after resuscitation, transfusion, etc. than would otherwise be the case.

The use of nitrous oxide oxygen anaesthesia does not involve any period of delay in recovery and patients can be evacuated almost immediately after operation.

It has been found that teams working on these lines at M.D.S.’s or A.D.S.’s have expedited the work both of the Field Ambulances and the C.C.S.’s. The main work of the Ambulances in evacuation of the wounded is not interfered with; moreover the transference of the serious cases to the team obviates congestion and delay in the main dressing room. The C.C.S. is enabled to concentrate its attention on abdominal, thoracic and other urgent surgical work as the cases dealt with by the teams are marked with distinctive labels and in many instances are found to be fit for immediate evacuation to Base Hospital.

The lives of many men have undoubtedly been saved by this method of early treatment in the forward area and it is recommended that the principle of surgical resuscitation teams might with advantage be widely adopted throughout the Medical Services.

Record of cases by teams in recent operations, Aug-Sept, 1918 (exclusive of cases receiving general resuscitation, rechauffement, etc. closure of penetrating chest wounds, major dressing, etc).


Report of Consulting Surgeon, Fourth Army: Several months’ experience in the Casualty Clearing zone behind the Australian Corps has enabled me to form an estimate of the excellent work of the resuscitation teams of that Corps. There can be no room for doubt that very many lives have been saved by the work of Major Holmes a Court and the members of the other resuscitation teams. Their experience in the Dressing Stations coincides with that of the Casualty Clearing Hospitals that in blood transfusions we have the most remarkable and valuable means of treating cases of severe shock and haemorrhage. Their results conclusively prove the value of these methods of resuscitation in the Field Ambulance.

(B) Establishment and Equipment of a divisional Surgical Resuscitation Team.

Establishment:

Medical Officers, 2

from Other Ranks (including 1 N.C.O. (4 T.S.D.)

Equipment:

Surgical instruments (see Appendix A) 1

Gas Oxygen apparatus 1

Blood transfusion set (see Appendix B) 1

Gum infusion set 1
BOWLS, BASINS ETC APPENDIX C DRESSINGS RECHAUFFEMENT BOX

*SET NO. I F.S.P.O./T.S.D.
(Field Service Pannier of the Tent Sub-division of the Field Ambulance concerned).

Transport:
1 Motor Ambulance to be available, for Divisional team for T.S.D. transport.
The whole to be a complete unit, mobile, attached for duty to M.D.S. or A.D.S. as required.
When Division is out of line, the team to remain attached to an Ambulance, supernumerary to its establishment, and to be available for ordinary ambulance duty if necessary.
When the Division is out of the line the team resumes duty with their T.S.D. or is detailed to a C.C.S. for instruction and practice.

It can be seen from Major Holmes a Court's report that not only was much time saved in the earlier treatment of wounds, thus relieving the Dressing Stations to a certain extent, but in many cases lives and limbs as well. Simply being able to remove the tourniquets from bleeding limbs at a much earlier stage made the difference one would expect, and the use of the newly devised, but now much tried and trusted Thomas Splint for fractured legs, applied at such an early stage, must have saved much pain and shock.

It is of interest that the Field Ambulance Resuscitation teams were an Australian innovation, for they must surely be the forerunners of today's coronary care ambulances, even though this development came some sixty years later in Australia.

Also of interest is the fact that the anaesthetist in the teams had to be one "experienced" in the use of nitrous oxide; almost a specialist, in fact. There were more of these medically qualified personnel, except in times of great pressure of cases, when specially trained medical orderlies were employed. One could speculate about the long continued use of nurse anaesthetists in America, since a number of Australian surgeons, as the specialty of anaesthesia developed, looked nostalgically back upon the war days with these orderlies who "did as they were told."
The growing new breed in operating theatres in the 1920s and 1930s rather "did as they had learned" and were regarded as a threat to surgical autonomy.

As in other wars many contrivances were devised to overcome logistic shortages of equipment. Butler's book mentions and illustrates a number of these, and in connection with the Field Ambulance Resuscitation Teams cites one in particular. This was a glass milk bottle adapted for the purpose of saline infusion. The apparatus was first made by Lieutenant Colonel Piero Fiaschi in 1917 and was commended in a report by Professor Bayliss to the Medical Research Committee in November 1917.

Obtaining blood for transfusion was no problem at the Casualty Clearing Stations, since it was rewarded with three weeks leave in England, but questions of time and preservation were somewhat of a barrier to extensive use by the Resuscitation Teams, which made greater use of the various saline solutions, and Fiaschi's apparatus was of great assistance. Since Fiaschi had a special interest in anaesthesia and was obviously now interested in resuscitation, was he, in 1918, a member of the Resuscitation Team?

In the light of present-day knowledge the description of "The lines of progress: transfusion v infusion" makes quaint reading, but is worth quoting, as showing how developments during war influenced events in civilian life post-war.

The lines of progress: transfusion v infusion.
The history of the treatment of wound shock and haemorrhage—which for practical purposes included shock with haemorrhage—by the artificial replacement of red blood cells, has been especially insisted on by Professor Agote of Buenos Aires. Thus, for the greatest orgy of blood letting in human history medical science had ready in "transfusion of blood" a means for its prompt replenishment which in the last two years of the war was widely exploited in the treatment of both haemorrhage and shock; which has, indeed, (God save the mark) been extolled as a "lesson" for peace from the simplest case, that of a fall of blood pressure due to haemorrhage uncomplicated by other stages. As will be seen, however, in practice this simplification is scarcely possible, except in certain cases.

Although, no doubt, the transfusion of blood itself is the ideal method of replacing that lost by haemorrhage, this procedure is not always practicable and requires caution or preliminary test of compatibility of the donor's blood with that of the recipient. Moreover, if it were possible to practise the intravenous injection of an appropriate artificial solution at Advanced Dressing Stations, many lives might be preserved. This aspect of the problem has been especially insisted on by Lieut. Colonel Fiaschi, A.A.M.C., and by Captain Bullock, R.A.M.C."

We see that in this description the Fiaschi name is linked with that of Captain Bullock, and that their work was of use to the Resuscitation Teams, directed by Major Holmes a Court. All three men were to become closely associated with Sydney Hospital, and so it came about that in 1921 Sydney Hospital, the oldest in Australia, was the first in Australia to appoint two "Resuscitation Officers", Dr Holmes a Court and Dr George Bell, for supervision of and instruction in blood transfusion in the hospital. In the same year Dr Holmes a Court was appointed as Tutor in Anaesthetics to the hospital.

The study of history sometimes brings both satisfaction and surprise. The appointment of "Resuscitation Officers", as boldly recorded in the history of the Sydney Hospital and its documents, so long ago as 1921, came as a surprise. It was most satisfying to find the background of these appointments.

It is salutary to consider that it took a World War, and injuries to hundreds of thousands, to establish the place of blood transfusion in the treatment of wound and operative shock. Butler puts it somewhat differently and more dramatically.

In November 1914—a cardinal date—the first "transfusion" with whole "citrated" blood was carried out by Professor Agote of Buenos Aires. Thus, for the greatest orgy of blood letting in human history medical science had ready in "transfusion of blood" a means for its prompt replenishment which in the last two years of the war was widely exploited in the treatment of both haemorrhage and shock; which has, indeed, (God save the mark) been extolled as a "lesson" for peace from the simplest case, that of a fall of blood pressure due to haemorrhage uncomplicated by other stages. As will be seen, however, in practice this simplification is scarcely possible, except in certain cases.

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Continued on Next Page
World War I... Continued from Page 5

that vampire. If we may judge from recorded experience, cases calling for such treatment were much more in evidence than in any previous war. This, we may suppose, was due to two features: first to scientific addition warfare, with its lac­erating wounds and multiple wounds and winter fighting; second (and the more important) to a medical service organised and accredited as never before for the succouring of wounded, whereby deeper levels (so to speak) of damage were "tapped" for treatment, and more pre­carious rescues attempted from that No­Man's land of death and life that supplies the tragic and fluctuating figures for "died of wounds."

Butler also mentions as "Pre-war devel­opments" which prepared the world for "the greatest orgy of blood letting" the fact that "Credit for the Scientific exploitation of blood transfusion" (love the phrase!) belongs chiefly to America. Before the war, British surgeons and physiologists had stayed on the lines of saline infusion. Between 1901 and 1910 ex­transfusion" (love the phrase! ) belongs chiefly in exceptional circumstances. This seems to into the phenomena of isohaemolysis [sic] and iso-agglutination had discriminated four types of blood, and thus laid the foundation for a solution of the "donor" problem.

It is significant that Barton, writing of experiences in a Casualty Clearing Station, speaks of selecting "group 4" donors, except in exceptional circumstances. This seems to suggest that blood grouping, even in the heat of war and many casualties, had become more or less routine; a vast change and one of im­portant in civilian practice when these experi­enced men returned to Australia.

Thus the full acceptance, for the first time, of the restoration of blood volume and haemoglobin levels as vital elements in the treat­ment of blood loss and shock.

Before proceeding to anaesthesia itself during the war of 1914-1918, some back­ground should be provided: of the conditions under which anaesthetics were administered; of modifications made to cope with patients in a condition rarely seen in civilian life; and of the daily mingling, especially on the Western Front, of medical units of the armies of several nations.

Captain Hugh Poate, later a distinguished surgeon knighted for his services to medicine and very involved in preparations for the early Diploma in Anaesthesia, wrote a letter to his father upon arrival in Alexandria, dated June 8, 1915.

This letter was reprinted in the Medical Journal of Australia. Although written about a hospital ship experience where no handy evacuation to a Casualty Clearing Station was possible, it gives a most poignant, though fac­tual, description of conditions under which medical officers worked during and imme­diately following the various battles. To read it is to understand why so many modifica­tions of civilian and hospital practice were necessary; it also prompts the thought that this experience and others like it, may have been a factor in Sir Hugh's attitude to, and consultation with anaesthetists when the time came for postgraduate education in the special­ty, for this attitude was different from that of many surgeons of his era.

Alexandria, 8/6/15

Have just arrived here after the hard­est five days work I have ever put in. We came on board this boat on 1st inst., af­ter having been ashore near the village of Moudros on Lemnos Island* for eight days, where we had absolutely nil to do, went for a few marches and had two or three swins a day. This boat has only just brought out some British troops, and before this for some months acted as a "prison-ship" for Germans. The 'tween decks were allotted with bunks packed close together, and rather a dark and dis­mal place, so we set to work to remove them all, keeping the spring mattresses and beds. It was a big job, as there were some 1400 to remove. Anyhow, we set to it, and by the morning of 4th had the decks cleaned and washed, and the beds all laid out and made ready to take on 950-1000 patients. It was just as well that we did work so hard, for on Friday, at 10 am, a boat came alongside and told us we had to receive 94 patients from Gaba, Tepe, i.e. where our Australian and New Zealand division landed. A number of these were mild "sick" cases, e.g. influenza, dysentery, etc., and a few slightly wounded, and we soon fixed them up. The Colonel, who had not been too well, then crocked up, and has been in bed for three days hors de combat, so Aspinall and I had to carry on. I forgot to say we had received five junior R.A.M.C officers to give a hand, but no men other than the 50 N.C.O.s and men we had of our own unit. We had orders for full steam to be kept up, so expected a move at short notice all day, but at 7 p.m. an­other trawler came alongside with three officers and 152 men wounded from Cape Helles, where the British are. A big attack had been in progress all day, and they said we could expect wounded by the thousand. It only took us an hour and a quarter to get them all on and into bed. Aspinall went on to the boat and called out the injury, and I sent them along to the various parts we had set out for the several classes of injuries we had arranged for.

*(Casualties from Gallipoli were evacu­ated to Lemnos.)

We had some very bad cases with these, but decided not to do anything but dress them that evening, so we all set to, and by 1 a.m. had them all as comfortable as could be, and then turned in, but were up at 5 a.m. on 5th to receive another batch of 12 officers and 71 men, mostly all very seriously wounded, as this ship had already sent off her slight cases. It took us about 1 1/2 hours to load these, as nearly all were stretcher cases, and while this was going on another boat drew up with more serious ones for us; so as soon as the 5 a.m. lot were on we cleared the next boat of 9 officers and 35 men—again nearly all stretcher cases.

We set to work to try and fix some of them up, and both Aspinall and I were operating all day long on the worst ones. The Colonel was in bed; the R.A.M.C. chaps were busy, two giving anaesthetics for us and the others going around the cases.

We had to depend on one of our own men for assistance at operations. All our fellows were at work, too, with dressings, and the ship's people, stewards, etc., were helping with meals, etc.

At 7 o'clock that night we took on another lot of four officers and 150 men, some very seriously, but, luckily, a lot of slightly wounded.

We had just cleared this ship when at 9 p.m. another arrived with 18 offic­ers and 209 men, again a fair leaven of slight cases, but a few ghastly ones. We were just setting to work to dress these when at 11 p.m. we had another lot of 102 to take on, among them being 36 of their worst cases and the re­mainder of their very slightest, as we refused to take any more officers, and had as many serious ones as we could possibly manage; so sent word we were full up and our accommodation strained to the utmost. We then had on board 46 officers and 813 men. Not bad going, especially as close on 800 had been taken on in under 30 hours!

Fortunately, they did not try to make us take any more.

Well, we got to bed about 2 a.m. and were up at 7 a.m. to see what we could do, and were very pleased to receive sailing orders and leave at 9 a.m. on...
Sunday 6th, for Alexandria. All day Sunday I was in the operating theatre going strong until about 11 p.m.—Of course, time off for meals.

Luckily, we had fine weather for the trip back, which took us about 12 hours longer than it should have, as the Captain had received Admiralty orders to zig-zag all the way by day on account of submarines, which, as no doubt you know, are in the neighbourhood and have done some damage.

On Monday 7th, we were at it again all day, and until late at night. This morning (Tuesday) I did only one case. Altogether I did 23 operations, including five brain cases, and Aspinall did 15, with four or five brain cases also. Our mortality has been so far very low, considering the nature of the cases: only nine deaths so far, but there are several others who cannot possibly live, as e.g., some head cases, lung, abdomen and spine cases, none of which had been operated on, as they were hopeless. There is a particularly virulent form of infection in some of these bad wounds, which spreads very rapidly, and against which it is hard to fight. We have had a number of them infected with a gas-forming organism.

It is now 8 p.m. and we are still anchored in the stream and no orders received!

We are looking forward to some letters here. I believe they are going to put us off this boat and send her back to England, in spite of our having worked so hard to get her ready for hospital work, and she is by far and away the best boat we have been on for this work. All we want is a few more orderlies and a little further rearrangement of space below; and we could take 1000 cases easily—say, 300 of the very serious and 700 slight cases. At present with this lot we have over 50% serious, which means very heavy work for all. 300 is more than enough of bad cases in any one ship.

It is hard to conceive what the actual atmosphere in those operating theatres must have been like; heavy with exhaled chloroform, ether and nitrous oxide; the constant logistic necessity of renewal of anaesthetic agents and surgical supplies; the weariness of the whole theatre team, with postoperative rounds still to be done. If one of the problems in earlier domiciliary obstetrics with long anaesthesia was the semianaesthetised state of the medical practitioners working in small closed rooms with volatile agents, this must surely have been multiplied in the conditions on the ship. Other similar papers, written after the war, comment on the dedication and acceptance of multiple duties by the nursing staffs under war conditions, and this must certainly have applied on Poate's ship.

The patients being coped with in the crowded camps and ships were not those encountered in civilian practice. Papers speak of the care and adjustments necessary when anaesthetising shocked men who during hours of waiting had received several doses of morphia. They speak of extra difficulties with anaesthetising fit soldiers for minor procedures who had received no premedication preparation for operation, and a number of whom would rejoin their battle-lines in a very short time. Also mentioned are problems of giving anaesthetics for operative procedures, and major ones of which they had no previous experience; it is not surprising that there came innovations in both techniques and apparatus.

Our old friend Hornabrook, who had already received citation for work in the Boer War, and was still Australia's only specialist anaesthetist, wrote of his experiences in practically every area of battle and, unusually for the medical journals of the period, spoke scathingly of the many medical men in Australia who had not enlisted, which left shortages of medical officers to the army. These shortages curtailed the possibility of leave for those serving, and this, said Hornabrook, added to the general dreariness of the scenes of battle, with houses, trees and grass destroyed and was extremely dispiriting. In addition, and this he knew from experience, there was the gloomy prospect of return to Australia to find practices had disappeared, and that surgeons who had not enlisted had formed other associations. Being Hornabrook, he also described the difficulties involved in playing a game of cards during an air raid, when all had to dive for cover.

If you are playing bridge it is most annoying just as you have a grand trump call to hear the bombs getting nearer and nearer, and then for someone to jump up and put out the light; it generally interrupts the rubber for the rest of that night.

Hornabrook also states that during a raid it was better to be busy "than lying waiting and wondering in your bed where the brute is going to drop the next—will it fall short or beyond?—Is a state of mind that does not conduce to sleep."

The man who is really at work comes off best. I have known the explosion of a bomb upset the even induction of an anaesthetic, especially when your patient is not more than two hours from the fighting line and has all the excitement of a recent severe action running through his brain.

The concluding remarks and vivid descriptions given in this paper are worth quoting in full, for they indicate why our first long-term specialist's papers and demonstrations were all so well attended. Strangely enough, quite a number of these particular remarks could be applied to another war in another era, but in the same area, whilst his conclusion applies to any war, anywhere, anytime.

Of visits to the neighbouring field batteries with some Australian officers from No. 9 Squadron Royal Flying Corps—Burgess, from New South Wales, Watts, from Nairne, South Australia, Moore, from Melbourne, Mackay, an old Geelong College boy—it is not the time or place to speak. Of Pilkem Ridge, now a shell-torn elevation only a few feet in height, one has to be told that "this is Pilkem" to know that it is a ridge, a mere undulating elevation with every tree torn and shattered, not a vestige of green on any one of them, reminding us of the ghosts of gum trees so often seen in the ring-barked areas of Australia. Of a glorious joy-ride to Dunkerque and a quiet little evening dinner with the Australian lads from No. 9 Squadron Royal Flying Corps, when the friendly Hun came over in a squadron of some twenty machines and gave Dunkerque "hell", just as we had got half way through our quiet little evening meal, but the wine was in and the fear was out, if only temporarily, and the meal was finished, and we got our money's worth. Of the ride back to our quarters, a twenty-five mile spin through the fresh night air—away in the distance the flash as each bomb struck home, the constant flashing from the guns like a concentrated display of summer lighting, the fireworks in the air from rocket and flare, the bursting shrapnel fired on the visiting planes, it is not now the time to speak; but it was worth it all, and those of our profession who miss those days and nights miss something that they will always regret, when, by their selfishness or inability to go and lend a helping hand, they hang back in Australia. The time has come when marriage or other causes are no excuse for an able-bodied man to fail to relieve some of those who have been two or three years away.

Continued on Next Page
World War I. . . Continued from Page 7

... the “tyranny of distance” is rarely a factor. As I sit and pen my pages, some call quite often elicits a response such as “He’s away,” or wherever. Nowadays, for Australasian anaesthetists in civilian practice, the need for fragments of information, a phone call quite often elicits a response such as “He’s in Poland”, “He’s in Denmark”; “She’s in South America”; or wherever.

The 1914-1918 war, however—and for that matter World War II—was the first chance most had had to see the work of anaesthetists of other countries, to become involved in discussions on techniques and agents, to study the equipment devised in other countries; all of these to be adopted or adapted or discarded, either during the war or on return to civilian practice.

One thing seems to have become firmly fixed in most minds; the determination that, with anaesthesia developing as they saw it, anaesthesia in Australia should remain in the realm of the medically qualified person.

An article in the Commonwealth Jubilee issue of the MJA in 1951, amongst articles on the development of the specialties, cites an experience which was inherent in the determination.

During the 1914-1918 war an Australian medical officer of a surgical team journeying in France from one casualty clearing station to another, met a Canadian surgical team. With the Australian team there was only one nursing sister; with the Canadian team there were two. This seemed so unusual to the Australian surgeon that he asked the two sisters what they did with the team. The senior said, “I sling the slumber juice.”

Although this nursing sister was a competent anaesthetist, there were many who were not, and together with the new experiences undergone in wartime anaesthesia, the article goes on to say:

The war of 1914-1918 redirected the attention of Australian medical practitioners to anaesthesia—the subject merited special attention, the “slumber juice” had to be given with care and full understanding and not slung.

The article by Rupert Hornbrook, already quoted, also indicates the association of medical officers of several nations, all working in close communication.

At No. 12 Casualty Clearing Station we had seven teams working, in addition to the ordinary staff of the hospital. Each team consisted of four persons, viz, a surgeon, an anaesthetist, an operating theatre sister and an orderly. The teams were as follows: Three British teams, two American, one South African and one Australian.

There were two operating theatres, one containing six tables, and the other four. Two teams worked at a time, and in eight hour shifts, except when a push was on, when we worked for 16 hours straight on end, and then had eight hours off.

With this sort of set-up, it is little wonder that one anaesthetist imbibed the ideas of another from another country, and that those active gas machine developers copied and/or improved upon the other machines they saw in use.

Hornbrook also made it to the famous military plastic surgery hospital in Sidcup, whence came the work of Ivan Magill.

Though all the above elements contributed to, and in some cases created, the changes which came in anaesthesia in the post-war decade, the anaesthetics given in the dressing stations and casualty clearing stations, at least where Australia was concerned, were much as those in civilian practice; the increased use of nitrous oxide being the exception. This was to be expected, for in the crush and rush of cases there was little time for experiment, and with the exception of Hornbrook and a very few others, medical officers administering anaesthetics had no special interest. This is indicated by the paucity of articles relating to field anaesthesia in the Australian journals and other literature, and also in the one specific article, again written by Hornbrook.

This article could, in fact, be used as a summation of methods of anaesthesia in Australia at the time of World War I. It would also have been appropriate as an exposition to medical and dental students just commencing their undergraduate practical work in pain relief, for it describes the simplest techniques in the simplest ways. It also gives necessary warnings about a clear airway, advises premedication, and mentions that the rectal anaesthesia, which he saw in use at Sidcup, before the arrival of Ivan Magill, must be subjected to careful observation both during and after operation, since respiratory depression could supervene at any time until the patient had completely recovered.

It is typical of Hornbrook that, as he describes the various techniques, we also get a glimpse of Hornbrook's war.

The open ethercum chlorofomerum ethyl chloride method is applicable to practically all cases and all temperatures. I have found it equally successful in the over-saturated, moisture laden climate of the tropical Pacific and in the freezing climate of a winter in the North Sea, or as the summer and in the bitter cold of the recent winter in France and Belgium.

He'd been around, all right!

The article makes little mention of anaesthetic machines, and this is not surprising, for insufflation machines and “cumbersome” gas machines, delicate and difficult of transport and needing regular servicing, were hardly the stuff of moveable dressing stations and field ambulances, though probably in use at the more stable casualty clearing stations and army hospitals in civilian areas.

There is no doubt that the 1914-1918 war gave much impetus to development of anaesthesia, and, as a by-product, the status of the anaesthetist. In Australia, when the forces had returned and contemplation of the importance of anaesthesia and its deficiencies, in the recent war, could take place, there was a good deal of action. Several major hospitals, for the first time, appointed anaesthetists; Sydney Hospital, though not taking this “huge” step (for the surgeons) did appoint a man with much war experience as Tutor in Anaesthesia and also instituted its Resuscitation Team, as we have seen.

The impact was further to be noted in two large and important BMA meetings, devoted solely to anaesthesia, which took place in Melbourne and Sydney in 1921, and in the inclusion of anaesthesia in the programmes of the first postgraduate committees in Australia, formed in Sydney and Melbourne in 1920.
An Enduring Scotsman

The following Presidential Address by Dr. Stuart McGowan was delivered in 1991 to the Scottish Society of Anaesthetists and was printed in the Annals of this Society in 1992. We are much indebted to Dr. McGowan and the Editor of the Annals for permission to reprint the tale of the numerous exploits of Dr. Alec MacKlin during his lifetime.

Presidential Address

by Dr Stuart McGowan

Let us now praise famous men
(Ecclesiasticus 44:1)

In 1991 Dundee celebrated its Octocentenary. Traditionally, Dundee has been famous for Jute, Jam and Journalism, but in the 19th century it was also famous for its whaling and shipbuilding industries. Whale oil was used as a lubricant for jute fibre. The Dundee whaling fleet had sailed further north than any other ships, and had also ventured into the Antarctic.

The shipbuilding yards in Dundee specialised in building wooden whaling vessels which could spend one or two winters stuck in the ice and still reach home safely. And so it was natural that in 1901 the Committee of the National Antarctic Expedition chose a Dundee shipyard to build the Royal Research Ship DISCOVERY to carry Scott and Shackleton to the Antarctic.

This marked the beginning of the long connection between Dundee and what is known as the "Heroic Age of Antarctic Exploration." Many of the ships involved in the British expeditions were built in Dundee, the TERRA NOVA, the NIMROD, the MORNING and the AURORA. Shackleton was invalided from the Discovery Expedition with scurvy and later became the Secretary of the Scottish Geographical Society. He resigned from this to stand as a Parliamentary candidate in Dundee, but was not elected.

In 1907 he returned to the Antarctic and made a second attempt to reach the South Pole. This time he reached within 100 miles of the Pole before having to turn back. In spite of his failure, Shackleton received a hero's welcome and was knighted by the King. Scott and Shackleton both longed for the honour of being first to reach the South Pole. As we all know, Scott reached the Pole in his 1911 expedition, only to find the Norwegian explorer, Amundsen, had beaten him by a few weeks. On the return journey, Scott, Wilson, Bowers and Oates all perished.

This then was the situation in 1914 when Shackleton was planning his latest expedition to Antarctica. The South Pole had been conquered twice. Something more grandiose was now required. He decided he would cross the whole Antarctic Continent from the Weddell Sea to the Ross Sea by way of the Pole. Two parties and two ships would be required. The smaller party would sail in the AURORA from New Zealand to the Ross Sea, where they would land and lay down depots of food between the Ross Sea and the Pole for the benefit of the main party who would land on the Weddell Sea side of the Continent and march across by way of the Pole. The main party would sail in the ENDURANCE.

Raising money for the expedition was a problem as usual, when suddenly, out of the blue, Shackleton received a cheque for £24,000 from Sir James Caird, a Dundee jute magnate. Sir James was a widower whose only child had died. He was a compulsive philanthropist. In his home city of Dundee he had donated the Caird Hall, Caird Park, and the Caird Pavilion of Dundee Royal Infirmary. His gift to Shackleton was made free of all conditions. Shackleton could now advertise for men to join his expedition and he received 5000 applications.

He appointed two medical officers to accompany him on the ENDURANCE. One was Dr Alexander MacKlin, the subject of my Presidential Address.

MacKlin was born in Melrose in 1889, but he was brought up in the Scilly Isles where his father was in general practice. He graduated in Manchester in 1912 and spent two years working in hospitals in Manchester and Blackburn before joining Shackleton's expedition.

The ENDURANCE sailed out of the Thames on August 1st, 1914, and put into Plymouth on August 4th. This was the very day that Britain declared war on Germany. Shackleton was plunged into a dilemma. How could he sail away to the Antarctic when his country was at war? On the other hand, he had planned this expedition for over a year and raised the money. He telegraphed the Admiralty, offering to put his men, ship and provisions at their disposal. A few hours later the First Lord of the Admiralty, Winston Churchill, gave them permission to proceed.

Thus began one of the great adventures of all time. The ENDURANCE sailed first to South America and then to Grytviken, a whaling station in South Georgia, before entering the Weddell Sea. Today Antarctic explorers can phone home with excellent reception, but when the ENDURANCE left South Georgia on 15th December 1914, she sailed into limbo. There was no further communication between the two halves of the expedition nor with the outside world.

Within a few days they encountered pack ice. Gales and low temperatures were the order of the day. The ship dodged about, pursuing a course due south whenever it could, steaming course due south whenever it could, steaming hard against the young ice to force a passage.

On 10th January they sighted the coast of Antarctica and, turning westward, sailed along the barrier edge, looking for a suitable landing place. They could have landed at Glacier Bay on the 15th of January, but Shackleton decided to press on, hoping to reach Vahsel Bay 100 miles further on. As things turned out, the expedition had lost its only chance of landing on the Antarctic Continent.

Soon the ENDURANCE was brought to a halt. A gale from the northeast piled the pack ice behind and around her. The temperature dropped suddenly and on the 19th of January the ENDURANCE was beset in the ice. At first Shackleton was hopeful that the ship would break free again. Whenever a crack opened up in the floe, some attempt was made to break through. The men worked hard with chisels and ice picks, but their efforts were in vain. Shackleton realised that they would have to spend the winter in the ice.

Dr MacKlin was especially disappointed as he had been chosen as one of the six members of the expedition who would make the crossing of the Antarctic Continent. Shackleton made sure that each man on board should still have his work to do - the scientists, the photographer, the artist, the carpenter and so on. Each of the men chosen for the trans-continental party was put in charge of a team of dogs. It was his duty to get on terms with the animals, to feed and tend them, choose a leader, exercise the dogs when conditions allowed and produce a workable team. The dogs were moved on to the ice and the men built shelters for them.

For the next eight months the men lived on the ship throughout the Antarctic winter. They
were encouraged to get out and walk on the ice whenever it was possible, but were warned to look out for cracks. Lights were fixed on 25 foot poles at the port and starboard sides of the ship, which lighted up a great deal of the floe.

The pack ice was never entirely stationary during the winter. Early in June there was a lot of pressure near the ship. The noise was described as very loud, like an enormous train with squeaky axles being shunted with much bumping and clattering. You could stand on the blocks of heavy rafting ice and feel the irresistible forces of nature working under your feet as the Weddell Sea current exerted its slow but mighty force.

From July onwards the ice was increasingly disturbed. Cracks were appearing and, as the pressure increased, huge blocks of ice were piled up in confusion. The ENDURANCE began to list to port and the dogs’ quarters were wrecked. In October the ship began to leak, and all hands manned the pumps. The immense pressure of the ice caused the ship to bend and strain, and finally Shackleton ordered the evacuation of the ship, and camp was set up on the ice floe nearby. Although the ENDURANCE was wrecked, she did not sink for another three to four weeks on the 21st of November. During this period they managed to remove most of the ship’s stores and take them to the camp. The three lifeboats were named after the main sponsors of the expedition—JAMES CAIRD, DUDLEY DOCKER and STANCOMB-WILLS. The largest was the JAMES CAIRD being 23 1/2 feet long, the JAMES CAIRD being 20 1/2 feet, and the STANCOMB-WILLS being 20 1/2 feet.

For five and a half months Shackleton and his 27 men camped on the ice in the middle of the Weddell Sea. Their ship had sunk. Their only shelter was a few tents. But all the time the ice was drifting in a northwesterly direction. In all they drifted 1600 miles away from the Antarctic Continent. They hoped that eventually they would be close enough to dry land to be able to walk across the ice to it, or just have a short boat trip. At first there was plenty of food which had been saved from the ENDURANCE, but as time passed they had to rely more on catching seals and penguins. The blubber from seals was used as fuel for cooking purposes and boiling water.

On the 2nd of April 1916, the last two teams of dogs had to be shot. The dogs had become a liability, now that it was obvious that they would soon have to take to the lifeboats. They used up valuable food in addition. Macklin’s team of dogs was the last to be shot and he was very sad to have to carry out this act.

A week later, on the 9th of April, the ice floes broke up beneath their feet. The northern front of the pack was being smashed by the autumn gales of the Southern Ocean. The three boats were quickly loaded and launched. Their position was 60 miles southeast of Elephant Island, a desolate ice bound island in the South Shetland group.

On the first day they rowed about seven miles. As it was getting dark they found a large floe, so they pulled alongside, hauled their boats up on to it and pitched the tents. After a good meal they were all in their sleeping bags by 8 pm. Three hours later the ice floe cracked under one of the tents. A seaman finished up in the water, still in his sleeping bag. Shackleton leaped over and with one mighty heave pulled him out of the water onto the ice. A few seconds later the two halves of the floe swung together with tremendous force. The seaman was none the worse, but no one slept again that night. They kept warm by tramping the floe and huddling round the blazing fire of seal blubber until dawn.

On the second day they launched the boats and rowed out through the ice till they reached open water. They set sail but the sea was too heavy for their deeply laden boats. They decided to return to the shelter of the pack and unloaded their boats on a floe berg. There they abandoned one third of their food supplies, pitched their tents and after a hearty meal, slept for 12 hours.

When they awoke they saw a magnificent and beautiful sight. Great rolling hills of jostling ice sweeping past them in half-mile long waves. But it was a sight that they did not like, for the floes were thudding against their floe berg with increasing violence. Fortunately a passage of open water appeared in the ice pack and they sailed out once more into the open sea.

It took them six days to reach Elephant Island. They were continuously cold and wet through on the journey, with the temperature dropping to 25 degrees below zero. Nearly all were frost bitten to some extent. They were suffering from dehydration from lack of fresh water. Many had been seasick. It was thanks to the skillful navigation of Frank Worsley that they reached Elephant Island.

They landed on a low rocky beach, brought their stores ashore and hauled their boats out of the water. Some of the men reeled about the beach as if they were intoxicated. They were laughing uproariously, picking up stones and letting handfuls of pebbles trickle through their fingers. They were on dry land for the first time since leaving South Georgia 16 months before.

It soon became obvious, however, that there was little hope of rescue if they remained on Elephant Island. No search party would look for them there. If anywhere they would look in the southern part of the Weddell Sea. And Elephant Island was no place to spend the rest of your days. It was desolate, barren, uninhabited and devoid of vegetation. It consisted of rocks and glaciers. They could certainly live off seals and penguins, but they wanted to return to civilisation.

Plainly the thing to do was to take one boat to the nearest inhabited point, risking the lives of a few for the preservation of the party. And the only practical goal, as everyone knew by now was South Georgia. Cape Horn and the Falkland Islands were much closer, but reaching either would require beating against the prevailing winds. South Georgia was 800 miles away but it was to leeward, directly in the path of the Westerlies that stormed round the globe at those latitudes. It would have been impossible to keep 28 men alive for that distance. The three boats could not have kept together and the smaller two would probably have foundered. They therefore concentrated their meagre resources on the largest boat, the JAMES CAIRD.

The carpenter, McNeish, a Dundee man, built up the sides by fifteen inches, constructed a whale back at each end and fitted a pump. He covered the space between the whale back with sledge runners, lids of boxes and old canvas. A ton of ballast was loaded onto the boat, mainly shingle sewn up in canvas bags.

Thirty days of food, water and oil and methylated spirits for the Primus were put on board, as well as six sleeping bags and some spare clothing. The six men chosen to make the boat journey were Shackleton himself, Worsley to navigate, McNeish the carpenter and three seamen.

On the 24th of April 1916, nine days after they had reached Elephant Island, the JAMES CAIRD set out on her journey. The men who stayed behind made a pathetic little group on the beach, but they waved and gave three hearty cheers.

With all three sails set, the CAIRD made good progress. They navigated their way through the pack ice in a few hours and were out into the open sea.

Sixteen days later they landed at King Haakon Bay on the northwest coast of South Georgia. It was an incredible journey for such a small boat. In this part of the Southern Ocean the great westerly swells roll almost unchecked around the world in what are known as the ‘roaring forties’ and the ‘stormy fifties’. They are the highest, broadest and longest swells in the world. Once again the success of their journey was due to Worsley’s magnificent navigation under the most difficult conditions. The sun appeared only on a few occasions to allow him to use his sextant, chronometer and navigation books to work out their position. Without his accurate readings they could have missed South Georgia completely to the north or south and finished up in the Southern Atlantic Ocean with no chance of survival.

Shackleton and his five companions had reached the west coast of South Georgia, but all the whaling stations were on the east coast. They felt they could not reach them by boat. They might be carried away by the currents and westerly gales out into the Atlantic. Shackleton decided to cross the island on foot.
with the two fittest of his companions.

The crossing over mountains, glaciers and crevasses was very hazardous. They were inadequately dressed and equipped. Their clothing and footwear were thin and worn. They had one rope and a carpenter's adze to cut steps in the ice. And yet they did it and thirty-six hours later they walked into the whaling station at Stromness.

They were greeted with incredulity. It was nearly two years since Shackleton had left Britain, and nothing had been heard of him since. He was presumed to have perished. In the whaling station every comfort was provided—the glorious luxury of a long bath, followed by a shave. New clothes were provided and a hearty dinner.

Worsley then boarded the whale catcher SAMSON for the trip to rescue the three men they had left behind at King Haakon Bay. At first the three castaways failed to recognise Worsley because his appearance had changed so much. They boarded the ship and the JAMES CAIRD was also taken aboard. On the following day the SAMSON returned to Stromness.

Shackleton's main concern now was to rescue the twenty two men on Elephant Island. Over the next three months he made four attempts in four different ships before he finally succeeded in reaching them. The first three attempts were defeated by the pack ice surrounding Elephant Island. Finally the Chilean sea going tug YELCHO got through and they returned to Punta Arenas in the Straits of Magellan. All twenty eight men returned safely.

Dr Macklin was just twenty five years old when he sailed on the ENDURANCE, as one of the two expedition surgeons. As the Antarctic is free of germs of all kinds, and the men were fit, his duties were not onerous. They did involve the veterinary care of the sledge dogs, who frequently fought among themselves. Frostbite and snow blindness were common ailments. The prevention of scurvy was always uppermost in his thoughts. Scurvy had been a bugbear of previous expeditions. Its symptoms and signs were well known but the cause was not obvious. It was not until years later that Vitamin C was recognised as a nutritional entity. Both Shackleton and Dr Macklin took a deep interest in scurvy and realised that it could be prevented by eating seals and penguins. No member of the expedition suffered from scurvy during the two years in spite of a total lack of fresh fruit and vegetables.

They all suffered from frostbite to some degree, especially on the boat journeys. In one member of the party the frostbite progressed to gangrene of his toes, and this required an amputation. The operation took place on Elephant Island, in the hut they had built by constructing two walls four feet high, using stones from the beach, then placing the two remaining boats, upended, side by side. A tent was then stretched across the top.

To sterilise the instruments, the cooking pot was filled with ice which was melted into water and brought to the boil. For an operating table, they placed a number of packing cases side by side and covered them with blankets. The men were herded outside to wait until the operation was over. Hurley remained to stoke the fire, by piling penguin skins on to the blaze. Every available blubber lamp was lighted, and the dingy interior of the hut grew fairly light. When it was warm enough, Macklin and McIlroy (the other expedition surgeon) stripped to their undershirts, the cleanest garments they had. The anaesthetic was chloroform and was administered by Macklin. He waited until the temperature had reached a sweltering 80 degrees before starting to pour a little of the chloroform onto a piece of surgical gauze. In a few moments the patient was unconscious and the operation began. It took fifty-five minutes altogether. After it was over, Macklin and McIlroy used the hot water in the pot to wash themselves down to their waists.

Ten days after returning to Britain from his Antarctic adventure, Dr Macklin found himself in France as Medical Officer to a tank battalion. He later served in Italy before being transferred to North Russia. Here he had to deal with extensive outbreaks of scurvy, smallpox, influenza and typhus and typhoid fevers. During the North Russian Winter Campaign he was given the task of organising special methods for the care of the sick and wounded in extreme cold, and for their transport by reindeer, pony and dog sledge. He spent many days in the Russian forest, testing methods of transport that would enable severely injured men to survive the intense cold and be brought in alive.

By the time he was demobilised Major Macklin had been appointed O.B.E. and awarded the M.C. for bravery. He was awarded the Polar Medal with its white ribbon for exceptional service on Shackleton's expedition. In 1920 he proceeded M.D. with commendation for his thesis entitled, 'The evacuation of sick and wounded from mobile columns'.

During the next five or six years Dr Macklin was continually on the move. He worked in hospitals in general surgery, E.N.T., eyes and fevers. He went to China and Japan as ship's surgeon in the Blue Funnel line. He made a second trip with Shackleton to the Antarctic on the QUEST expedition. It was during this expedition that Shackleton died of a heart attack on South Georgia. Macklin had the gruesome duty of performing a post-mortem on his friend; 'one of the most unpleasant tasks I have ever had to undertake', as he said later.

Finally in 1925 he settled in Dundee in general practice. His main interest was in general medicine and he was anxious to secure an appointment in Dundee Royal Infirmary, which was then the teaching hospital of St. Andrew's University. Being a total stranger, his chances seemed very remote, so he applied for the post of anaesthetist which fell vacant soon after his arrival. He was successful and was appointed to one of the major surgical units at an honorarium of £20 per year.

Dr. Macklin practised in the days before intravenous induction and before muscle relaxants. Ether, chloroform and nitrous oxide were the standard agents, and the early version of the Boyle machine was the standard equipment. Very soon he became dissatisfied with both chloroform and ether as routine agents. His chief objections to them were the unpleasant induction and the disagreeable after effects, namely headache, nausea and sometimes distressing vomiting. He regarded chloroform as too toxic for general use. Ether was safe 'on the table' but caused a high incidence of postoperative pulmonary complications.

And so he came to regard nitrous oxide as the ideal agent, with its easy pleasant induction and amazingly short recovery period. He published a series of 553 cases anaesthetised with nitrous oxide and oxygen as the sole agents. These included 61 upper abdominal cases, including gall bladders, and 175 lower abdominal operations. The first patient in his series was a woman of 72 years, admitted with acute intestinal obstruction due to carcinoma of the descending colon. The anaesthetic lasted 60 minutes and was a complete success.

Dr. Macklin compares anaesthesia using nitrous oxide/oxygen only with that using ether and chloroform. As far as induction and recovery go, gas/oxygen showed overwhelming advantages. During the operative period, relaxation could be a problem, with difficulty in closing the peritoneum. In such cases it was necessary to resort to secondary saturation which, although remarkably effective, requires momentarily a very deep and probably dangerous asphyxiation. But even in the worst cases recovery was very rapid.

Ill effects from hypoxia were particularly looked for, but they were conspicuous by their absence. A number of cases in his series remained definitely cyanosed during the whole operation without showing the least sign of distress (the breathing being quiet and regular, the pulse full, steady and not unduly quickened) and made an instant trouble-free

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Bits of Anesthesia Trivia

by Miguel Colón-Morales, M.D.

- The last milestone in the history of anesthesia was the introduction of curare to produce muscular relaxation during surgery.
- General anesthetics produce insensitivity by depressing the sensorial portion of the brain. The motor part is not so much affected by these anesthetics except in deep anesthesia which requires high doses of anesthetic drugs which have other side effects and dangers. Recuperation from the anesthetic is also prolonged, which may result in higher morbidity and mortality. "The operation was a success but the patient died" was a common expression in the old days. Very little could be done in those days to avoid this situation until the muscle relaxants came into use by physicians trained in the field of anesthesiology.
- Anesthesia produced by intravenous injection was introduced over 300 years ago.
- Sir Christopher Wren in 1657 produced unconsciousness in a dog by injecting an opium extract in the vein of a leg.
- The syringe and the needle had not been invented yet by Pravaz and by Wood.
- Wren used a bladder and the hollow end of a feather to inject the opium extract into the vein.
- This event remained forgotten for over 200 years.
- At the beginning of this century attempts were made to produce anesthesia by injecting various substances intravenously, such as chloral hydrate, ether, chloroform and alcohol. However, none of these substances produced anesthesia successfully when injected intravenously.
- In 1924, the use of intravenous anesthesia, as it is known today, had its beginning with the use of barbiturates injected in the vein of the forearm.
- In 1932, the use of rapid-acting barbiturates was a breakthrough when Evipan, a barbiturate, was synthesized and used to produce unconsciousness in a few seconds. Three years later thiopental was introduced in anesthesia practice.
Pioneering by Example

by J. Antonio Aldrete, M.D.

Sometimes many distinguished and effective teachers do not receive the recognition they deserve because of the simple and unassuming nature of their personalities, as well as the honesty and modesty of their character.

Such is the case of Robert Wallace Virtue (1904-1994), who had a modest upbringing in Denver, Colorado. Working at odd jobs, he helped to put himself through high school and college, graduating in 1926. He served first as a teacher and then as a principal in Paonia, Colorado. With a desire to further explore his potential, Bob decided to attend graduate school at the University of Michigan where he obtained his Ph.D. in Chemistry. There he met Mildred Doster, a medical student, and they were married in 1935.

Returning to Colorado, he taught Chemistry at the University of Denver and she practiced medicine and public health.

Eventually Bob went on to study Medicine and he graduated from the University of Colorado in 1946. Due to his chemistry background, he was urged to specialize in Anesthesia, so he went to what was then one of the top residency programs at the University of Iowa under Stuart Cullen’s guidance. There he was in contact with the many distinguished faculty members whom Cullen had attracted.

In 1949, Bob returned again to Denver and was promptly placed in charge of the Anesthesia Division and its teaching program at the University, which included Colorado General and Denver General Hospitals. Eventually, Fitzsimmons Army Hospital and the National Jewish Hospital were also affiliated. From the wartime newspaper reports of injured sailors in the Baltic/North sea waters surviving very critical injuries, he began thinking of their favorable physiological reactions from the icy water and related it partially to the drastic drop in body temperatures. It seemed certain that the reduction in body temperatures was a factor in prolonging life, as well as lowering pain levels to reduce shock, etc. While doing his own research on new intravenous and inhalation anesthetics, he also developed a technique of ice-water immersion to produce hypothermia for some of the first open-heart surgeries. He had the privilege of working with him in this venture. Patients were anesthetized and then immersed in a plain bathtub on wheels. Rectal and esophageal temperatures were monitored simultaneously; the latter fell promptly down to 33°C. When the rectal temperature also began to decline, it was then considered time to remove the patients from the tub and shake the ice-shield from them with a dry towel. They were then placed on the operating room table and prepped, while watching the body temperature drift down to 29 to 30°C. The entire process required coordination and skill.

Important observations were made on the effects of moderate hypothermia (between 28 and 30°C) on the action of muscle relaxants, antiarrhythmic and anesthetic drugs. During surgery, the climax occurred at the time the large vessels were occluded. The surgeons opened the atrium and closed the septal defect in less than 7 minutes. Interventricular septal defects were more complicated, took longer and always carried the danger of heart block produced by a suture placed around the Bundle of His. It was indeed an emotionally charged atmosphere as we counted the minutes aloud so the surgeons would know how much time was left. More than once we had to clamp the opening, allowing the blood to flow, and then go back finish the repair. The danger of air embolism was always in our minds until we saw the patients open their eyes and follow commands.

Dr. Virtue was always a balancing presence; he only spoke he needed to be heard and never raised his voice, but everyone respected his opinion and listened. More than once he pointed out to junior surgeons their mistakes, but it was done with kindness and never in anger. The tub on wheels is at the Smithsonian Museum at Washington, D.C., as it was indeed a first in medical history.

Pioneering work also was done by Bob with inhalation and intravenous anesthetics. His outstanding work was based on perfect methodology because he did all the work himself. He lived only two blocks from the hospital and came at night or on weekends, took the samples, ran them in the chromatograph, did the statistical analysis and wrote the papers himself. He reported the first death from liver damage following halothane anesthesia and in a way began the scrutinizing of morbid effects of anesthetics.

On the wave of enthusiasm with ketamine, a temperate voice was spoken by Bob as he summarized his experience with the paper, “Ketamine, Dangerous Because It Is Easy.” By doing so, he prevented the abuse of this anesthetic by untrained personnel outside of the operating room and therefore many possible catastrophes. The manufacturers of ketamine and some of its eager proponents were not happy about it, but at the end Bob was proven right.

These days I read publications on the cost of anesthesia. All they need to do is to follow Bob Virtue’s method; he knew how to keep costs down. At that time Anesthesia was a Division of the Department of Surgery and so the budget depended on an unsympathetic chairman who was proud of the dog laboratory budget, but gave the anesthesia service the least possible.

Nevertheless, Bob implemented some common-sense measures to prevent waste and to save on expenses. He evaluated low-flow gas anesthesia, as proposed by Francis Foldes, using 0.5 1/min of oxygen and 0.5 1/min of nitrous oxide after a three-minute period of 5 1/min total flow. By measuring oxygen saturation in arterial blood, he proved that it was safe to use this technique even in long anesthetic administrations. All residents were taught the theory and practice of low-flow anesthesia and closed circuit with oxygen and cyclopropane from the first day. This was done with no choice. Bob lowered the flows of anyone using wasteful volumes, no qualms about it.

When halothane became available, its cost made it prohibitive; since mask induction was definitely easier and smoother, it was preferred in children. To prevent wastage, Bob gave one 250 ml bottle of liquid halothane to each resident every month. They kept it in their own carts and guarded it as if it were liquid gold. They placed it in the vaporizer at the beginning of the case and emptied it at the end. Needless to say, each machine was checked thoroughly before each administration, thus reinforcing safety. By this simple measure, at the time abhorred by residents, Dr. Virtue implemented a simple doctrine; if you have to account for it, you take care of it.

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Dr. Virtue. Continued from Page 13

It was the same for laryngoscopes, esophageal catheters, IV catheters, etc. 20

In that manner we were able to compensate for the fact that the budget for Anesthesia increased very little in 18 years.

Other original work included pioneering studies with cyclopentane, 21 sulfur hexafluoride, 23 local anesthetic toxicity, 25 secobarbital, 22 γ- OH butyrate, 24 steroids and anesthesia, 26 V/Q changes during thoracotomy 27 and anesthesia for renal homografts. 28

Most importantly, Bob was an advocate of physician anesthesia. He trained rural GPs from Kansas, Wyoming, New Mexico, Nevada and Utah; they came for three months every year and eventually provided the western state with many anesthesia residents who resided in programs in anesthesia that were not prevalent.

Together we did some of the earlier work on long-term toxicity of anesthetics. 29,30 Low-flow anesthesia 32,36 and scavenging of anesthetic gases, 31 as well as the first anesthetics for liver transplantation. 34

He also advocated one-on-one anesthesia at all times; he saw all his patients before and after the anesthetic, he considered preordial and esophageal stethoscopes primary monitoring tools in anesthetic practice and he did not allow reading or sitting in the operating room as he believed that the patients deserved all our attention. 35,37

After his retirement in 1980, he went into private practice and while doing so conducted some crucial observations on the uptake of nitrous oxide and oxygen consumption, 39 proposing a technique that he called "minimal flow anesthesia" using 300 ml/min of oxygen and 200 ml of nitrous oxide. 40 Honest as he was, he pointed out some of the limitations of this technique. 10,20,32

Most importantly, Bob was a man of his word, kind to everyone, a model teacher; faithful to his University even when he was not treated kindly. Mrs. Virtue (Mildred Doster, M.D.) always at his side and helpful to everyone, made her own contributions, first as a public health advocate of children and later as a representative of senior citizens to the Governor's council and many community health projects.

Although I did not train under Bob, I was privileged to work in his faculty for five years. I learned clinical and basic research and how to run a department literally "on a shoestring," but most of all I cherished his example.

After I came back to Denver in 1975 as Chairman, I asked him to return as Professor Emeritus and my special consultant to our Department. He was always there in the mornings reducing the flows and questioning the residents. He still conducted research, gave lectures, and his presence was a stabilizing factor. His advice to me was always proper, timely and much appreciated.

In 1979 on his 75th birthday, we established the Robert Wallace Virtue, M.D., Ph.D., Departmental Library, still functioning in his name today, as the source of learning for new generations of anesthesiologists at the University of Colorado.

Bob continued to enjoy his hobby of mountain walking until his early eighties, having walked up to the top of many of the high mountains in Colorado, Europe and New Zealand.

He passed away on March 1, 1994, at the age of 90, which some may interpret as a confirmation that low-flow anesthesia reduces exposure to gas contamination and so decreases whatever risk is derived from it, as evidenced by the longevity of other protagonists such as Dennis Jackson, Ralph Waters, Stuart Cullen, Francis Fodels, Lucien Morris and Harry Lowe. In his own modest, honest and kind way he certainly has a place among the pioneers of anesthesia.

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Microscope-Maker Discovers Tiny Animals

by Erica Hershey

During the 1660s, when he was in his thirties, Antony Leeuwenhoek supported his wife and children by working at two jobs: He ran a dry-goods shop, and he held a minor civil-service post in the small town of Delft, Holland.

Leeuwenhoek had little schooling, but he was interested in science. His hobby was grinding lenses to build his own microscopes. He probably learned the fundamentals of microscope design from a book that was first published in 1665.

This book, called *Micrographia* ("Small Drawings"), was written by the brilliant English scientist, Robert Hooke. Among the microscopes described in the *Micrographia* was a simple, single-lens type, which appealed to Leeuwenhoek.

In his spare time, Leeuwenhoek built many of these single-lens instruments, each of which had a magnifying power of from 50 to 300 times. He used his microscopes to examine his own skin, the hair of various animals, the eye of an ox, the brain of a fly, the muscle fibers of a whale.

Although Leeuwenhoek learned to make extremely good lenses, he used a clumsy double-screw mechanism to mount specimens for viewing. Getting a specimen properly focused must have been a time-consuming chore. When Leeuwenhoek was pleased with his view of a specimen, he tended to leave it mounted on the microscope for months or years, making it easy for him to study the specimen again and again. If he needed to mount a new specimen, Leeuwenhoek often built a new microscope.

Some of his neighbors criticized Leeuwenhoek for wasting so much time grinding lenses and studying "useless" minutiae. Leeuwenhoek grumbled that his critical neighbors were shallow fools. He wrote: "I pay no attention to people who say to me, 'Why take such pains?' and 'What's the use of it?' because I don't write for such folks, but only for philosophers."

By the time Leeuwenhoek turned forty, he was making the world's best microscopes, but he refused to divulge the techniques he used to make his superior lenses. He was reluctant to allow most people to look through his microscopes, and he allowed nobody to borrow or adjust one of his precious instruments.

Antony Leeuwenhoek (pronounced "Lay-When-Hook").

In August of 1674, when he was forty-one years old, Leeuwenhoek was traveling by boat across a freshwater lake, when he observed a phenomenon that aroused his curiosity. He later wrote:

About two hours distant from [Delft] there lies an inland lake, called the Berkelse Mere, whose bottom in many places is very marshy, or boggy. Its water is in winter very clear, but at the beginning or in the middle of summer it becomes whitish, and there are then little green clouds floating through it; which, according to the saying of the country folk dwelling thereabout, is caused by the dew, which happens to fall at that time, and which they call honey-dew. This water is abounding in fish, which are very good and savory. Passing just lately over this lake, at a time when the wind blew pretty hard, and seeing [that the water had recently turned cloudy], I took up a little of it in a glass vial.

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Microscope. . . Continued from Page 15

The next day, examining the lake water under a microscope, Leeuwenhoek discovered that it was full of tiny organisms. Some of these creatures were long and thin, like snakes. They were coiled, Leeuwenhoek wrote, "just like the copper or tin coils which distillers use to cool liquids." However, "The whole circumference of these lines was about the thickness of a hair from your head."

Other organisms resembled "very small green globules joined together: and there were many small, rounded green bodies as well. Among these were very many small animalcules, of which some were rounded, whilst others a bit bigger were shaped like an oval ... These animalcules had different colors, some being whitish and transparent, others with green and very glittering little scales; yet others were green in the middle and white at both ends, and some were gray, like ash. And the motion of most of these tiny animals in the water was so fast, and so random, upwards, downwards, and round in all directions, that it was truly wonderful to see. I estimate that some of these little organisms were over a thousand times smaller than the smallest mites I have ever seen on such things as the rind of cheese, wheat flour, mold, and the like."

Leeuwenhoek had discovered the world of one-celled organisms. Further investigation showed him that tiny organisms were common in seawater and saliva, as well as in lakes. They reproduced themselves prodigiously in a mixture of rainwater and pepper, but they were slaughtered by vinegar, Leeuwenhoek discovered.

He reported his discovery to the Royal Society of London, which commissioned Robert Hooke to investigate Leeuwenhoek's claims in 1677.

At that time, Hooke had not worked seriously with a microscope for more than a decade. After publishing his Micrographia in 1665, Hooke had put away his microscopes to concentrate on solving important problems in astronomy, physics, and chemistry. Despite being out-of-practice with the microscope, Hooke quickly confirmed Leeuwenhoek's discovery. In November of 1677 Hooke and another scientist, Jeremiah Grew, brought microscopes to a meeting of the Royal Society. All the Fellows present were thrilled to observe a menagerie of tiny wriggling beasts, which Hooke and Grew had bred in a mixture of pepper and rainwater.

Soon afterward Antony Leeuwenhoek was inducted into the Royal Society. He received a diploma in a silver case, with the coat of arms of the society on the cover.

SOURCES:
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- Microbe Hunters, by Paul de Kruif. Harcourt, Brace & Co. 1926.
Anesthesia History Association
Spring Meeting Scenes
Buffalo, New York
May 9, 1996

Photographs Courtesy Douglas Bacon, M.D.

A.J. Wright
Ray Difalque
Rob Strickland
Doug Eastwood

(Front Row) Hansel D'Souza, Sam Tiver, William Hammonds, Ted Smith

Bill Hammonds, Don Caton

Douglas Bacon, K. Garth Huston, Jr., Paul Knight

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Doris Cope
WLM History Review:  
_Spirits of Anesthesia_

**SUBJECT: Crawford W. Long and His Contribution to Anesthesia**

**BOOKS**


Dr. Frank Kelso Boland was a prominent Atlanta physician who was for many years the Chair of the Committee on Medical History of the Medical Association of Georgia. After the death of Frances Long Taylor, he took up the effort to have Long recognized for his role in the discovery of anesthesia. This book is the product of his research on Long. Boland presents the theory that Jackson first heard about ether anesthesia prior to 1842 when he traveled through Jefferson, Georgia, perhaps on his way to the gold mines in Dahlonega. This book is well researched and should be read by everyone interested in the ether controversy.


This book by Dr. Jacobs, a pharmacist who began his studies with Dr. Long, contains personal collections of his mentor. Also included are the recollections of others who knew Long in Jefferson and Athens. It includes examples of Long’s personal correspondence. The book was out of print for many years until it was reprinted by the Georgia Society of Anesthesiologists in 1992 for the sesquicentennial of the discovery of surgical anesthesia.


This book provides a portrait of Crawford W. Long as seen through the eyes of his devoted daughter. It provides details of Long’s ancestry and early life. The author’s impressions of Long’s opinions about the controversy and its impact on his life are presented from her unique perspective.

**Other Resources**


This article informs the reader about the Crawford W. Long Museum. The Museum’s history and mission are discussed. Additional information is included which details the governance of the museum, its development and its financial support. Its complementary role with the Wood Library-Museum is discussed.


This paper traces Long’s education from undergraduate education at Franklin Academy (later to become the University of Georgia), to the completion of post graduate training in surgery in New York City. Long’s medical education is discussed in the context of the evolving medical education of the day. His education was more academic and incorporated more clinical experience than most medical doctors of that day received. Long finished his education in 1841 with the best medical education offered in North America at that time.

*Long CW. An Account of the First Use of Sulphuric Ether. Southern Medical and Surgical Journal. 1849; 5:705-713.

In this article, Long tells the story of his use of ether for surgical anesthesia. He explains how the idea first occurred to him and how James Venable, when facing surgery, agreed to be the first patient because of “dread of pain.” The sobering statements of Venable and a witness are included. Long describes other anesthetics that he gave as experiments to satisfy himself that anesthesia was produced by ether and not by the effects of the imagination. Long describes his paper detailing his use of ether as a “plain unvarnished” account of his experiences.


This is the publication of the Wood Library-Museum’s Fifth Annual Historical Lecture given on October 20, 1971, at the American Society of Anesthesiologists meeting in Atlanta, Georgia. It sets the historical stage well, citing current events of the early 1840s in the United States and in Jefferson, Georgia. It contains a good discussion of the factors that led to the delay in publication of Dr. Long’s use of ether as well as interesting speculation about circumstances that promoted the discovery, such as Dr. Long’s distinguished traditional education and the free atmosphere in the frontier town of Jefferson.

*Loan or photocopy available from WLM. † Available from the Crawford W. Long Museum. Compiled by William D. Hammonds, M.D., Edited by Donald Caton, M.D.
Etymology Corner

by Massimo Ferrigno, M.D.

This corner is dedicated to the etymology (origin) of medical terms, and it also an excuse to talk about mythological and historical figures. In this issue, we will consider the word most commonly used in our field.

ANESTHESIA (or Anaesthesia, if we want to be faithful to its etymology) derives from the ancient Greek ἀν (an, which means without) and ἀισθήσεως (aisthesis, which means sensation). Originally, this word had a moral connotation: Plato, the Greek philosopher from Athens (429-347 BC), used the term αναισθήσεως to mean lack of sensitivity, while the two Greek orators Isocrates (who lived in the 5th century BC) and Demosthenes (384-322 BC) used it to mean stupidity or irresponsibility. A similar use of the word anesthesia can be also found in Aristotle (one of the greatest philosophers, who lived from 384 to 322 BC, and who happened to be the son of a physician).

With regard to the medical use of the word anesthesia to mean lack of sensation, most anesthesiologists know that it was suggested by Oliver Wendell Holmes in a letter to Morton in 1846. However, the credit for using it for the first time should probably go to Dioscorides Pedanius, who lived in the 1st Century A.D., and who played a very important role in the history of medicine, and anesthesia in particular. Dioscorides was born in Anazarbus in the province of Cilicia (part of present Turkey) around 40 A.D. Tradition suggests that he studied botany and pharmacology in Tarsus, a nearby city with a long history of pharmacological studies, and in Alexandria. Dioscorides served as a physician in the army under the Roman Emperors Claudius and Nero and he wrote a major medical treatise, the “De Materia Medica”, which became a classic of medical literature for sixteen centuries, through the Middle Ages and Renaissance.

At the time of Dioscorides, many new spices and drugs had become available to physicians, thanks to increased trade with the East. In the “De Materia Medica”, he systematically describes the medical properties of slightly more than a thousand natural products (mostly from the vegetable, but also from the animal and mineral kingdoms) and he uses the word anesthesia at least twice in a clinical context. In book IV 75 (Wellman’s edition), he describes a mixture of wine and extract of mandrake root that could be used to treat insomnia, chronic pain and most important, to induce anesthesia during cutting and cautery (it sounds like “surgical anesthesia” to me!). Later on, in book V 140, Dioscorides describes a hearsay report of the use of the Memphis stone (Memphis was the ancient capital of Egypt). This shiny and variegated stone was apparently used as a powerful topical anesthetic: crushed in small pieces and spread over an area of the body, it could induce the same type of “surgical” anesthesia described above.