A Beginner's Guide to Blood Cells

Second edition. Barbara J. Bain. London: Blackwell, 2004.
ISBN 1-405-12175-0. 136 pp. £16.95 (illustrated paperback).

This compact book is easy to read and very clearly written and illustrated. As such, it represents the culmination of much experience in the field of blood morphology, and certainly Barbara Bain is a world-renowned doyen of this subject.

The book consists of five chapters. The first describes what a blood film is and how the cells within it should be counted. Here, red cell indices are defined in some detail and normal ranges are given, with an explanation of how these change with age and in relation to ethnic origin. Assessing red cells, the subject of the second chapter, is excellent, as is the third chapter on assessing white cells and platelets.

The only criticism I have of the book lies in the fourth chapter. Here, the haematological findings in health and disease are described and *further steps* to aid diagnosis are given. A variety of tests are suggested without any explanation of what these are for. Immunophenotyping, for example, is referred to on several occasions without an accompanying explanation of how this may in some cases be important in the diagnosis of, and prognosis for, certain leukaemias.

The French American British and the World Health Organization classifications of leukaemia are referred to, but not the more recent European Group for the Immunological Characterisation of Leukaemia or the British Task Force Recommendations.

The final chapter allows the reader to assess their knowledge and contains a number of exercises, multiple-choice questions and case studies. These would be challenging for any trainee in haematology. In conclusion, although it does not seek to be comprehensive, the book introduces the important basic concepts and sets haematological findings in a clinical context. □

M. G. Macey

Data Analysis and Presentational Skills

Jackie Willis. Chichester: Wiley, 2004.
ISBN 0-470-85274-7. 183 pp. £19.99.

This book has been written primarily to address the needs of undergraduate students in the medical and life sciences but it should also be of interest to anyone who is not familiar with the use of computers in the presentation of data. The initial chapter is of a very basic nature and presents an introduction to working in Windows. The author then deals with researching and planning projects and outlines the use of the internet as an information resource. Details of useful search engines and sites that can be accessed are presented and a section follows this on experimental design, which is also of a very basic nature.

There is a fairly detailed section on the use of Excel for collating data, preparing graphs, charts and tables, with clear examples of each type. The section on statistical analysis deals with the use of Excel in determining a number of statistical measurements (e.g., standard error of the mean, frequency distributions and regression analysis). Examples are given, with data, for the application of various statistical methods. Finally, there is a brief section on presentational skills, which outlines the use of PowerPoint.

This is a useful basic textbook that introduces students to the use of computers in the design of projects and in the acquisition and analysis of data. The most comprehensive sections cover the analysis and presentation of scientific data. However, the sections on experimental design and presentational skills are quite superficial and thus students would need to augment the information given by the use of more comprehensive texts in these areas.

This is a reasonably priced book, presented in a user-friendly manner and should be very useful for students in the medical and life sciences. □

T. G. Scott

Moments of Truth: Four Creators of Modern Medicine

Thomas Dormandy. Chichester: Wiley, 2003.
ISBN 0-470-86321-8. 563 pp. £18.99.

Medicine from the mid-19th century was transformed into a science-based profession and many of the myths of the previous centuries were debunked. In this book, the author traces the scientific developments of medicine through the contributions of four individuals: Laennac, Semmelweis, Lister and Reed.

Theo Laennac was raised in France during the French Revolution. A very bright child and something of a literary prodigy, he considered becoming a poet before he took up medicine. He studied medicine at a turbulent time in French history but in Paris there pertained a more radical approach to diagnosis in which careful physical examination of the patient was undertaken and the belief that clinical signs should be linked to an underlying pathology. Laennac had a non-compromising nature. He had published many papers and reviewed books and articles, and, if he disagreed with the underlying tenets of the author he was unrelenting in his criticism. Thus, he was unpopular with many in his profession but eventually obtained a post in a small hospital and gradually built up a reputation as an excellent diagnostician and lecturer.

Aescultation (placing the ear to the patient's chest) was the method in use for physical examination for chest sounds at the time. During the course of examining a very stout female patient, Laennac found the method to be inadequate and, in considering a solution, rolled up some sheets of paper to make a cylinder and applied this to the patient's chest and heard distinct heart sounds. He called the method mediate aescultation. Laennac produced several advances on his first 'stethoscope' and applied this approach systematically in the physical examination of his patients.

He attempted to link his findings to the underlying pathology and published his findings. The correct recognition of bronchiectasis and pneumothorax arose from this work. Within just a few years the stethoscope was in use everywhere and today, almost 200 years later, Laennac's stethoscope, with some modification, is the primary clinical

diagnostic tool. He died of tuberculosis at the age of 45.

The contribution of Ignac Semmelweiss, a Hungarian born in Budapest, was in the control of puerperal fever (childbirth fever) and, as a result, his work paved the way for our understanding of the transmissibility of infectious disease. Initially, undertook 'philosophical studies' at the University of Pest. However, having decided to study medicine, he moved to Vienna, then recognised as one of the leading centres where there was a tradition of emphasising the importance of morbid anatomy in the investigation of the process of disease and the importance of the detection of physical signs in medicine. He obtained a place, as an aspirant in obstetrics, under the tutelage of Professor Klein. Shortly after taking up his position, Semmelweis became concerned with the large number of infections and with the incidence of puerperal sepsis in particular.

At this time, theories as to its cause were manifold and included external factors such as 'cosmic emanations' and internal factors such as locheal suppression. Puerperal fever had occupied the concerns of many obstetricians. An epidemic of fever had been successfully contained by Robert Collis, Master of Dublin's Rotunda Hospital, by evacuating and fumigating wards. This suggested an appreciation of the transmissibility of puerperal sepsis.

In Klein's department there were two clinics: the first, headed by the professor, was staffed by doctors and medical students; the second by a professor and midwives. The rate of infection in the first clinic was up to 20 % but in the second clinic it averaged about 3%. Semmelweis began to analyse the differences between the clinics and quickly realised the condition could not be due to external factors. Semmelweis's first clue came when he began to consider the factors that led to the death of a colleague from pyaemia. This occurred after an accidental scalpel cut while performing an autopsy. Semmelweis realised that both conditions were similar and many of the first clinic doctors and students frequently came from the post-mortem room to the labour ward for deliveries. Thus, the transmissibility of this condition was possible.

Semmelweis immediately instituted a regime of washing in chloride of lime on entry to the clinic and hand washing with soap between patient examinations. As a result the incidence of infection fell from approximately 15% in May 1847 to 1.2% in August. Despite these results, however, Semmelweis encountered resistance from many of his colleagues and as this work predated Pasteur's *Germ Theory of Disease* he had little scientific support for his use of cleaning and antisepsis. But many enlightened obstetricians recognised the quality of his work and his antiseptic regime was accepted in other European centres.

Unfortunately, Semmelweis fell victim to political conflict at the time, which spilled over into the university sector. The radicals found him to be useful ammunition in their cause and for their opponents he was an ideal target. Semmelweis's personality did not help the situation and he left Vienna for Pest. He managed to obtain a post in a general infirmary and succeeded in having his chlorine prophylaxis instituted. Eventually he gained the Chair of Obstetrics in the university.

At the age of 38 he married a 19-year-old girl and finally published his work on puerperal fever in 1860, which resulted in a number of very personal criticisms but Semmelweis responded in kind. By this time, however, his health was failing and his behaviour became more erratic. He was admitted to a sanatorium and died from what is believed to have been an infected wound that led to pyaemia. There is strong evidence, however, that he was also suffering from neurosyphilis at the time.

Semmelweis's contribution is probably best highlighted by the many notices in hospitals worldwide today that urge careful handwashing.

The work of Lister in a way emulated that of Semmelwies as he furthered the development of antisepsis by introducing it into the operating theatre. Lister came from a Quaker family and from an early age showed a desire to take up surgery as a career. He entered University College London in 1844 to take a broad-based course in general philosophy. While there he was invited by friends attending the medical school to witness the first use of an anaesthetic in an operation in England. He studied medicine in London but was advised by William Sharpey, then Professor of Physiology, to visit Edinburgh Medical School. Lister did and remained for over 10 years. He prospered in Edinburgh and studied under James Syme, who was recognised as one of the leading surgeons in Europe.

Lister was an outstanding surgeon but he was slow and methodical in his approach. In the absence of anaesthesia this would have been a handicap as speed was essential but now this was no longer a problem. Soon after his appointment as a house surgeon he began to publish. Fate then intervened with the outbreak of the Crimean War. Surgeons volunteered their services and Lister obtained an appointment to fill one of the vacancies created. Shortly after, he married Agnes, one of Syme's daughters.

Lister's appointment was in the Royal Infirmary and his papers and lectures of the time covered an astonishing range of subjects. His main interests were the processes of inflammation and coagulation He demonstrated that coagulation and inflammation were linked. He was elected a Fellow of the Royal Society and attained an appointment as Professor of Surgery in Glasgow.

Lister's introduction to the possible role of germs in sepsis was through a chance conversation with the Professor of Chemistry in Glasgow, who recently had read the work of Pasteur. Lister was convinced that this provided the answer to hospital sepsis and gangrene, which had a mortality rate of nearly 50% at that time. However, Phenol had been discovered and its antiseptic properties described.

His first success was on an amputee on whom he used a carbolic acid putty around the wound, which healed without putrefaction. The first antiseptic operation to open an abscess was also successful. He continued to apply his methods to compound fractures and amputations and published his findings in *The Lancet*. While he had his detractors, eminent surgeons from all over Europe visited Glasgow to see the new approach at first hand.

Although Lister's 'antiseptic method was successful it did have opponents, not least because it resulted in prolonged hospital stay. Subsequently, he introduced an antiseptic spray for use during operations as an additional aid in the prevention of infection.

Lister was appointed Professor of Surgery in Edinburgh, later in King's Hospital, and he lived to reap many honours, including the founding of the Lister Institute of Preventative Medicine, which dealt with the problems uncovered by the emerging science of bacteriology. Lister collaborated with

Pasteur and Koch, who were the two pillars of microbiology. He lived into his 85th year and was active almost to the end of his life.

The final subject of this book is Walter Reed. Born in Virginia, Reed entered medical school in the University of Virginia at the age of 16 years. Medical education in the USA at the time was of a very perfunctory nature and many schools had no clinical training, as was the case in the University of Virginia. Reed moved to Bellevue Hospital in New York to complete his clinical training. However, standards at Bellevue were poor, with a high incidence of fever and a very high mortality rate.

Following qualification, Reed moved to the Brooklyn Hospital and was later appointed Assistant Sanitary Officer of the Brooklyn Board of Health at 22 years of age. This awakened his interest in hygiene and the transmissibility of infection. However, he felt that his advancement in medicine was unlikely in New York and as result he joined the Army Medical Corps, which resulted in postings to various outposts in the USA, and eventually to Alabama. Reed then applied for leave of absence to take further study. He was fortunate that the appointment of a new Surgeon General coincided with this request and the new appointee was favourably disposed to encouraging further study. Reed took a course in bacteriology and pathology at the prestigious Johns Hopkins Hospital, which proved a turning point in his life.

Fate again intervened with the appointment of Sternberg, an internationally recognised medical scientist and bacteriologist, as the new Surgeon General. He founded an Army Medical School and invited Reed to become its Professor of Pathology. Reed had a particular interest in yellow fever, which was the single most dreaded disease in the Americas. Little was known about its aetiology but its mortality rate was feared. The interest in yellow fever was further enhanced by the outbreak of the Spanish–American conflict over Cuba, which resulted in war. Although there were probably only about 1000 war casualties, many more died from infectious disease, particularly typhoid and yellow fever.

After the war, Reed headed a commission to investigate the causes of acute infection prevalent on the island of Cuba. The role of mosquitoes as a vector in yellow fever had been proposed and Reed's group set about evaluating this possibility. The infective agent had been purported to be a bacterium but Reed's group was convinced of a viral origin. Confirmation of the mosquito as the vector was achieved using a set of experiments with human volunteers who were allowed to be bitten by mosquitoes suspected of carrying the virus. The role for the mosquito was confirmed but the procedure used was unquestionably unethical and a number of volunteers died or had their health permanently impaired. Reed died, aged 51, from peritonitis following an appendicectomy.

While a selection of only four 'creators of modern medicine' must be an arbitrary one, each of these made a pivotal contribution to the development of medicine. The author presents a detailed personal picture of each, which provides a clearer understanding of how their circumstances and personality impacted on the ability to have their innovations accepted by their peers. In addition, they are also placed against a backdrop that highlights the political, social and cultural factors which pertained at the time and which influenced the advancement (or otherwise) of their findings.

This is a well-researched and lengthy book of some 560 pages. There is a wealth of detail present and this may be a failing as the background personal, political and cultural information can affect the flow of the text. However, with these few reservations, this is an extremely interesting and valuable book. □

T. G. Scott