Sixty years of haematology

B J Bain

A story of remarkable scientific advances

The diamond anniversary of the *Journal of Clinical Pathology* (JCP) provides the opportunity to reflect of the past 60 years of haematology. It offers the chance to look back as well as forwards. This has been a time of unforeseeable advances, of which I remember only those of the past 40 years. Review of the articles published by the journal in its first decade immediately makes evident the changes that have occurred in haematology as a science and as a clinical discipline. In the late 1940s haematology was still largely a laboratory discipline. The first editor of JCP was, in fact, a haematologist, Dr Gordon Signy. In 1943, the Association of Clinical Pathologists invited him to produce a bi-annual bulletin but he soon transformed this into JCP, which he then edited with great distinction for more than 25 years.

A third of the articles published in the journal in the first decade dealt with

haematology. Blood cell counting, coagulation, and blood transfusion were all well represented. In the first decade, no less than five articles were published on Rhesus (now Rh) blood grouping, one of which dealt with Chown's capillary tube method, still remembered by older haematologists forced to do out of hours laboratory work in their younger days. These were also the days of the enumeration of red cells and white cells in counting chambers, of the estimation of haemoglobin concentration by colour comparison, and of the assay of vitamin B₁₂ assay using cultures of *Euglena gracilis*. Haematologists with vision were groping towards an understanding of blood coagulation with fibrinogen, prothrombin, and "tissue thromboplastin" having been discovered. This was a time of simple and practical technical innovations including a "blood pipette shaking machine", a "mechanical aid in making blood films", a "multiple

Figure 2 A hand drawn diagram showing a comparison of two techniques for the coagulation time as published by Dr C Merskey in 1950.³ Two haemophiliacs had their coagulation times measured every second day. Four readings for the Dale and Laidlaw method fell in or near the normal range, but repetition of three of them (circles) all fell outside the normal range. The broken lines illustrate the normal range of each test.

manual register for differential leucocyte counts", and the rather frightening "instrument for combined sternal biopsy and aspiration" (fig 1).^{1,2} Publications of this era have some attractive features. I like the hand drawn diagrams and drawings of blood and bone marrow cells (figs 2, 3)^{3,4} and even more I liked the admirable honesty. Three authors in 1950 wrote "the sternal puncture proved to be misleading, mainly on account of the authors' ignorance of the similar cases previously recorded".⁴ I would rather like to see modern authors admit their fallibility in an equally straightforward manner.

This was also the time of research that would now not receive ethical committee approval—for example, that involving the transfusion of red blood cells from patients with haemolytic anaemia or polycythaemia vera into volunteers, either other patients or healthy subjects.

The first decade of the journal gives little impression of the haematologist as a clinician. One of the rare clinical articles, published in 1950, dealt with a two syringe technique for exchange blood transfusion. Also striking because of its absence is any mention of leukaemia or lymphoma. These diseases might almost not have existed.

The past 60 years have seen both technical progress and remarkable scientific advances in the discipline of haematology. The laboratory tests preoccupying our forefathers have become much more automated and standardised, more accurate and more precise, more speedily performed, and more clinically useful. Scientific progress has been seen particularly in our understanding of the nature of both inherited and acquired disorders of the blood and blood forming organs. The

Figure 1 A combined sternal biopsy and aspiration needle, as described by Dr BA Thompson in 1952²; left, outer needle and trephine with stylet in situ; right, both needles dismantled showing component parts.

Figure 3 Drawing of neuroblastoma cells in a bone marrow aspirate, as published by Drs Piney, Mallarmé, and Ross in 1950.⁴

ready accessibility of blood cells and bone marrow cells has meant that haematological neoplasms were investigated and understood much earlier than solid tumours. Haematology saw the first demonstration of a specific recurrent cytogenetic abnormality in association with a specific neoplasm, and this was followed by the demonstration of specific molecular genetic abnormalities associated with specific subtypes of leukaemia and lymphoma. These scientific advances were accompanied and followed by major therapeutic advances explicable on a molecular basis, such as the discovery of the effectiveness of all-trans retinoic acid in promyelocytic

leukaemia and of imatinib in chronic myeloid leukaemias associated with BCR-ABL and with rearrangement of the PDGFRA or PDGFRB genes. Concurrently with the scientific and therapeutic advances in leukaemia, there have been similar scientific advances in the fields of haemoglobin genes and their disorders and in blood coagulation and thrombosis.

"The laboratory tests preoccupying our forefathers have become much more automated and standardised, more accurate and more precise, more speedily performed, and more clinically useful"

During the past 60 years, the haematologist has become a different sort of person. In many countries he, or increasingly she, has moved out of the laboratory and become a clinician, often to the detriment of laboratory haematology. Subspecialisation continues apace. No longer is it possible to have a grasp of either laboratory or clinical haematology in their entirety, let alone both. This is an inevitable effect of the increase in knowledge and the increasing range of what we are able to do, and is mirrored in other clinical and laboratory disciplines.

What will be the advances of the next 60 years? Scientific advances will accelerate as enormous monetary and human resources are poured into medical research. Laboratories will become even more automated and the role of

computers will increase even further; perhaps artificial neural networks will replace some functions of the pathologist. Haematology will become increasingly molecular, both in its diagnostic and in its therapeutic approach. Treatment will be based on a much more precise understanding of the nature of the conditions we are treating and will become much more individualised. Effective blood substitutes will surely be developed and recombinant proteins and gene therapy will improve our management of inherited disorders. One thing that will not change is the excitement of discovery in this rapidly evolving field and the challenge to cure diseases that are still incurable.

ACKNOWLEDGEMENTS

I should like to thank Dr S Mitchell Lewis who has read this manuscript and has shared his recollections, going back some 20 years earlier than mine.

J Clin Pathol 2005;**58**:789–790.

doi: 10.1136/jcp.2005.030585

Correspondence to: Professor B J Bain, Department of Haematology, Imperial College, London, UK; b.bain@imperial.ac.uk

REFERENCES

- 1 **Bernstock I**, Sterndale H. An instrument for combined sternal biopsy and aspiration. *J Clin Pathol* 1951;**4**:378–80.
- 2 **Thompson BA**. Combined sternal biopsy and aspiration needle. *J Clin Pathol* 1952;**5**:112.
- 3 **Merskey C**. The laboratory diagnosis of haemophilia. *J Clin Pathol* 1950;**3**:301–20.
- 4 **Piney A**, Mallarmé J, Ross MS. The bone marrow in Hutchinson's syndrome. *J Clin Pathol* 1950;**3**:230–8.