

Automation and Data Processing in Pathology

Symposium organized by
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Edited by
T. P. Whitehead

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Foreword

The papers in this Symposium were in three groups. The major part of the first day's programme was spent discussing the use of automated equipment in the four main branches of pathology. During the second day the Conference was concerned with a series of papers and discussions on the use of computers in the pathological laboratory. Obviously the two days were interrelated but it was not possible to keep the subjects exclusive to the separate days and the organizing committee felt that this division ensured adequate time for discussion on these separate but interrelated problems.

Towards the end of the first and at the start of the second day, there were three general papers separately concerned with the role of the computer in the pathological laboratory, the laboratory report as part of the total patient record, and also a general paper on the use of computers.

Mr Michael Healy, a statistician and Head of the Computer Department at the new MRC Clinical Research Centre at Northwick Park, took part in the Conference. He was asked to comment on the direction or lack of direction resulting from our discussions.

The group who organized this Conference held the view that there are many mutual problems within the four major disciplines of pathology. Those who practise one particular branch of pathology cannot ignore the developments in the other branches because combined interest in the problem is important and has already led to important developments. The Conference confirmed this viewpoint.

Many representatives of industry were present at the Symposium. It is not necessary to emphasize the role of the scientific instrument industry and the computer industry in future developments of laboratory medicine. We, in pathological laboratories, should play our part in the stimulation, development, and testing of apparatus. One could spend a long time developing this theme but suffice to say that we have a pathological service in this country which is second to none, but it has progressed, particularly during the last 20 years, using equipment developed, for the most part, outside Great Britain. There have been some faults on the part of the British scientific instrument industry; mutual collaboration is vital. Development of new apparatus for the hospital laboratory of the future cannot be done by committees, it has to be done by mutual collaboration between enthusiastic hospital laboratory workers and a particular company or organization. If this Symposium stimulates such collaboration it will have achieved an important objective.

The Committee responsible for the organization of the Symposium was chaired in the embryo stages by Professor R. Curran and later by Dr F. Hampson. Professor Cunliffe was mainly responsible for the organization of the Conference, ably helped by Miss P. L. Chater and Miss E. M. Fearn. This publication would not have been possible without the editorial work of Miss G. Liddle.

Contributors

M. K. ALEXANDER Consultant pathologist in the South Warwickshire Hospital Group and Honorary Fellow in Pathology of Birmingham University. He graduated at Liverpool in 1944 and commenced his training in pathology at Cambridge in 1948. Since 1965 he has been concerned with a laboratory automation project which is in progress at Warwick. He was a member of the Association of Clinical Pathologists working party on data processing in clinical pathology (*J. clin. Path.*, 1968, **21**, 231). His publications include, with W. M. Priest, 'Islet cell tumour of the pancreas with peptic ulceration, diarrhoea and hypokalaemia' (*Lancet*, 1957, **2**, 1145), 'The postmortem estimation of total body fat, muscle and bone' (*Clin. Sci.*, 1964, **26**, 193), and, with R. N. Allan, 'A sex difference in the leucocyte count' (*J. clin. Path.*, 1968, **21**, 691).

D. G. CHALMERS University haematologist to Addenbrooke's Hospital and a member of the Department of Pathology, University of Cambridge. He holds an honorary consultant appointment with the United Cambridge Hospitals. He qualified from Guy's Hospital, London, in 1949, and held a number of appointments there including a research fellowship and a registrar post in clinical pathology. He moved to Cambridge in 1956 and assumed his present appointment in 1959.

He is chairman of the United Cambridge Hospitals Computer Management Body responsible for the planning of a hospital computer system to be installed in 1972, and chairman of the Computer Liaison Committee coordinating computer development between the hospital and medical school. He was a member of the Association of Clinical Pathologists working party on data processing.

He has published work on immunological reactions of leucocytes, lymphocyte culture, erythropoiesis, and anti-coagulant therapy.

F. V. FLYNN Graduated from University College Hospital Medical School, London, 1946. At present, consultant chemical pathologist and Honorary Director of the Computer Unit at University College Hospital. Recently, Chairman of the Association of Clinical Pathologists' working party on data processing in clinical pathology. In the last few years Dr Flynn's research has been concerned mainly with blood chemistry in health, serum and urine proteins in disease, and with the use of computers in clinical chemistry.

W. W. HOLLAND Educated at St Thomas' Hospital Medical School, London, where he took a BSc in physiology in 1951 and qualified MB, BS (Honours) in 1954. He was awarded the MD in 1964. After appointments at St Thomas' Hospital, the Epidemiological Research Laboratory of the Central Public Health Laboratory, the London School of Hygiene, and Johns Hopkins University School of Hygiene, he returned to St Thomas' Hospital Medical School in 1962 as senior

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E. G. KNOX Graduated in Newcastle in 1949 and entered academic paediatrics, developing interests in epidemiology, population genetics, and the uses of computers. He spent some time at the Department of Social Medicine in Birmingham, returned to paediatrics at Newcastle, and again to social medicine at Birmingham. He now occupies the second chair.

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Since entering the field of hospital biochemistry, his interests have been chiefly concerned with the investigation of inborn metabolic errors associated with mental retardation (*eg, Arch. Dis. Child.*, 1963, **38**, 425) and over the past few years with automation and data processing in the clinical chemistry laboratory.

M. G. NELSON Has been, since 1947, consultant clinical pathologist at the Royal Victoria Hospital, Belfast. He has held posts in the Department of Pathology, Queen's University, Belfast, including a lectureship in clinical pathology. From 1940 to 1946 he served both at home and overseas in the Medical Branch of the Royal Air Force. In the field of laboratory medicine his sole interest is now in haematology and he is responsible, not only for the laboratory investigations, but also for the clinical management of patients with haematological disorders.

He has contributed a number of papers on haematological subjects to the medical literature and has been appointed Honorary Reader in Haematology to Queen's University, Belfast.

B. E. NORTHAM BSC, PHD, FRIC Qualified at Birmingham University, 1948. Dr Northam has been interested in the routine and research applications of the continuous flow system in laboratory automation for many years. From 1964, he has served as Secretary of the Association of Clinical Biochemists' study group on automation in clinical chemistry and has been closely involved in the development and evaluation of discrete analysis systems.

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Contributors

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P. H. A. SNEATH Director of the Medical Research Council Microbial Systematics Unit and Honorary Reader in Biology at Leicester University. He has been interested in the application of computer methods to medical and biological problems, in particular to the classification of bacteria. He has lately been concerned with computer methods in identification and diagnosis.

J. W. STEWART Qualified at London University, 1944. Reader in Haematology, University of London, and consultant haematologist to the Middlesex Hospital. He has been interested for many years in automatic blood counting and now in developing techniques and standardization of blood cell counting.

A. I. SPRIGGS DM (Oxon), FRCP (London) Graduated at Oxford in 1943. Since 1947 he has worked in the Pathology Department at the Radcliffe and Churchill Hospitals, Oxford. In 1952 he obtained the DM with a thesis on the cytology of effusions, and since then has specialized in diagnostic cytology; he holds a joint appointment as consultant and as director of the British Empire Cancer Campaign unit on clinical cytology at the Churchill Hospital. His main interests have been in the cytology of effusions and cerebrospinal fluid and circulating tumour cells; also in chromosomal changes in tumours of man, particularly those of carcinoma *in situ* of the cervix uteri.

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GEOFFREY H. TOVEY Qualified 1940, Bristol University. Since 1946 has been Director of the South West Regional Transfusion Centre and clinical teacher in haematology, University of Bristol. Since that time his primary research interests have been in the antenatal prediction of severity in Rh and ABO haemolytic disease of the newborn. The Bristol Transfusion Centre has pioneered the automation of routine blood donor grouping in the United Kingdom. Dr Tovey is currently engaged in organizing a National Tissue Typing Service for the British Isles.

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I. D. P. WOOTTON Professor of Chemical Pathology at the Royal Postgraduate Medical School of London, is interested in the clinical applications of biochemistry and has been concerned with automation and computer applications in hospital laboratories.

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The Proceedings of a Symposium organized by the College of Pathologists

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