mental research work, which remains, however, intimately connected with practical medical problems.

The present somewhat ponderous name of the Institute recognizes a double loyalty, to the Hospital which brought the Institute into being, and with which a close association is maintained, and to McGill University, which embraces the Institute as part of its family of research units. As a member of the McGill Research 'family' the Institute has become a valuable training ground for students and for postgraduate investigators. The present writer is director of the Institute and professor of biochemistry in McGill University; two members of the staff of the Institute, Dr. P. G. Scholefield and Dr. E. H. Creaser, are assistant professors of biochemistry in the University.

The Institute has, at present, a staff of thirty-five, of whom sixteen are students working in the field of biochemistry for their Ph.D. degrees under the supervision of senior members of the Institute, and twelve are post-doctoral investigators. Both the students and post-doctoral investigators are drawn from various parts of the world. At present, as many as twelve different nationalities are represented. There are members, for example, from Canada, Britain, Australia, India, Pakistan, Japan, the Philippines, Hungary, Greece and Poland.

More than 150 original scientific articles have been published, from the Institute, by members of the staff since the Institute was opened about ten years ago. They are all in the biochemical field, and are concerned with investigations mostly undertaken because of their relation to medical problems. Some of the work lies in the cancer field, some in a field of study devoted to problems of the central nervous system, some in the fields of virology and microbial chemistry, and some of the work is associated with the subject of intestinal absorption. The problems that have been, and are being, investigated are concerned with the biochemical behaviour of cancer cells and of embryonic cells, with the effects of antimetabolites on cell processes, with the mode of action of narcotics, anæsthetics, alcohols, and other substances affecting the behaviour of the nervous system, with the metabolic problems concerned with virus growth, with the mode of action of antibiotics, with the role of amino-sugars in metabolism, etc. These investigations, pursued at a fundamental level, make it possible for students in the Institute to acquire a broad experience of biochemical problems and techniques. Much of the work is necessarily enzymological in character, and a good knowledge of the biochemistry of enzymes is indispensable for the approach taken, in the Institute, towards its various problems. Radioactive techniques and procedures are followed in almost every phase of the work. Problems of nucleic acid metabolism and nucleotide synthesis, protein synthesis, phospholipid synthesis, all problems which are being actively investigated in the Institute, require their due quotas of carbon-14, phosphorus-32 and sulphur-35. Geiger counters operate on each floor of the old residence, and precautions have to be taken that no contamination by radioactive materials makes its appearance in the laboratories. Tumour transplantation in animals is carried out fairly extensively, as may be expected in an Institute which has to do with cancer problems, but the fact that transplantation of certain tumours into embryonated eggs is a successful procedure relieves to some extent the pressure on the animal house and the high cost of animal upkeep.

The Institute, now an active biochemical research centre, is very crowded, and there is no part of the old residence, in which the Institute is housed, that is not put to good use. It is well equipped, and it is surprising how well the many rooms of various dimensions serve as laboratories. Much of the laboratory furniture is home-made, and there is an excellent workshop that is indispensable for repair work as well as for the building of instruments.

Almost the entire work of the Institute is financed by grants and fellowships from a variety of organizations such as the National Cancer Institute of Canada, the Cancer Research Society, Inc., the National Research Council of Canada, the Rockefeller Foundation, the National Science Foundation and other scientific societies without the financial support of which the Institute could not survive. A number of commercial firms have also generously assisted the Institute; to these the Institute is very greatly indebted. The fact that the research work of the Institute depends so greatly on the financial help of many organizations, who support its work after due examination and appraisal of submitted projects, makes the task of organizing long-term research programmes a difficult one. It is greatly hoped that the Institute will one day be given a permanent endowment that will make it possible for the Institute to carry on part of its work without financial anxiety.

The Institute has been fortunate in the co-operation afforded it by the various departments of McGill University and its teaching hospitals, and also in the warm friendliness and active help of the chairman of the Biochemistry Department, Prof. D. L. Thomson. As Dr. F. C. James, principal of McGill University, and Mr. W. W. Ogilvie, president of the Montreal General Hospital, have justly stated, in a foreword to a brochure recently issued concerning the Institute, McGill University has long pioneered in many important fields of research. Since the days of Rutherford and Osler, McGill investigators, and others connected with the University, have contributed greatly to scientific and medical knowledge. The Institute is doing its best to maintain this tradition. Its success so far is due largely to the enthusiasm, devotion and hard work of its members, and it looks forward to a very productive future.

OBITUARIES

Dr. G. M. Bennett, C.B., F.R.S.

GEORGE MACDONALD BENNETT was born on October 25, 1892. His father, the Rev. J. E. Bennett, a great admirer of George Macdonald, the Scottish writer, had entered the Baptist ministry but established a private boarding school, Clacton College, towards the end of the past century, putting into practice many ideas which were then unorthodox but are now more generally accepted. Here Bennett received his early education; after the founder's death, the school was continued by Harold Picton, one of Ramsay's brilliant young men who had become associated with it in 1900. It is a tribute to this school, and perhaps more to the young Bennett's

remarkable talents, that when he left it for East London (now Queen Mary) College in 1909 he embarked on an honours course in chemistry which he pursued by day while continuing with a correspondence course for an arts degree in the evenings and at week-ends. The resulting B.A. (1911) and B.Sc. (first-class honours, 1912) by the age of twenty foreshadowed the brilliance of his career.

In 1913 Bennett won an exhibition at St. John's College, Cambridge where he read chemistry, physics and mineralogy, taking a first class in both parts of the Tripos and being elected a Fellow of the College in 1917. He was then working under Prof. W. J. Pope, but his active mind ranged beyond the immediate war-time work, such as that on ββ′-dichlorodiethyl sulphide, and turned to crystallography, which he had learned under Hutchinson, and stereoisomerism.

Soon after the end of the First World War, Bennett worked for a short time with Strange and Graham, a firm of consulting chemists, and then was appointed a demonstrator at Guy's Hospital, London. From here, in 1924, he went as lecturer to the University of Sheffield, where in 1931 he succeeded Prof. W. Palmer Wynne as Firth professor. After seven years he returned to London to fill the vacancy caused by the retirement of Prof. Samuel Smiles at King's College, London, and soon had to cope with evacuation to Bristol. Here, although his department suffered from bombing, Bennett kept the teaching going and maintained an output of research.

In 1945, on the death of Sir John Fox, Bennett was appointed Government chemist. To some, this seemed a strange transition, but those who knew his wide knowledge and his mastery of detail were sure that he would justify the appointment—as he did, for the normal tenure was extended, but he did not live to complete the additional two years.

Space permits only a brief mention of a few of the lines along which Bennett worked, but these are selected to show his wide interests: surface tension and the constitution of liquids; isomerism of some ferrocyanides; reactivity of the chlorine atom in chloro-substituted sulphides; velocities of reactions of various types, particularly with reference to polar effects; glycols and thioglycols; stereoisomerism of disulphides, dioxides and related substances; valency angle of oxygen and of sulphur; crystal form of anhydrous citric acid; configuration of heterocyclic compounds; formation of large-ring sulphur compounds; liquid crystals; mechanism of nitration.

Bennett received the degrees of Ph.D. of London and M.A. and Sc.D. of Cambridge. He was elected to the Royal Society in 1947 and was appointed a Companion of the Bath in 1948. He was among the first old students to be made a Fellow of Queen Mary College. He was an honorary secretary of the Chemical Society from 1939 until 1946, having served on the Council during 1929–32, and was vice-president from 1948 until 1951. He served the Royal Institute of Chemistry on the Council for two years, as examiner for five years, and as vice-president for two years.

In 1918 Bennett married Doris Laycock, a Cambridge graduate, and her tragic death at Christmas 1957 from a rapid form of cancer no doubt aggravated the heart trouble from which he died suddenly and peacefully on February 9, 1959. He combined great gifts with humility and kindliness.

A. D. Mitchell

Dr. H. D. K. Drew

Harry Dugald Keith Drew died in London at the end of December at the age of seventy-two. He was educated at Queen Elizabeth's School, Barnet, and at Birkbeck College, London, graduating B.Sc. in 1910. His active professional career as a chemist began in 1919 when he joined G. T. Morgan, then professor of chemistry in Birmingham, as research assistant, after war service in the R.N.A.S. In 1922 he was appointed to the teaching staff of the University of Birmingham as lecturer in chemistry; in 1930 he became reader in organic chemistry in the University of London at Queen Mary College, a post which he held until he retired in 1947.

Drew's earliest published work was in collaboration with G. Senter and with A. McKenzie, and was concerned with the investigations on the Walden inversion which were then being carried out at Birkbeck College. In his later work, the interest in stereochemistry was maintained and developed along independent lines. The most striking of these researches was a re-investigation of Vernon's observations on the isomerism of the dialkyl telluronium dihalides, which were assumed to be *cis-* and *trans-*isomers resulting from a planar distribution of the valencies of tellurium. Drew established that the difference between the red α-dimethyl telluronium diiodide and the green β-compound is not one of *cis–trans* isomerism; the green compound has a salt-like character, Me_2TeI, $MeTeI_3$, whereas the red α-compound is Me_2TeI_2. He also inferred a tetrahedral distribution of the tellurium valencies. There were other investigations on tellurium and selenium organo-metal compounds, notable among these being the study of the interaction of tellurium tetrachloride with β-diketones.

In a series of papers from 1930 onwards, some in collaboration with the late Prof. W. Wardlaw and his school, the structure of platinum co-ordination compounds was examined in some detail and many of the inconsistencies and earlier conclusions corrected. Other topics which attracted Drew's interest were chemiluminescence and the metal lakes formed from orthohydroxy azo-compounds. While he was still on the staff in Birmingham, Drew was drawn into work with W. N. Haworth on the investigation of the ring structures of the sugars, and in this both he and E. L. Hirst played an important part in this revision of the then accepted structures.

In the late 1920's, Drew spent a period in Pregl's laboratory in Graz, and he returned enthusiastically in favour of the new system of micro-analysis of carbon compounds. He set up a laboratory for teaching Pregl's methods, and gave regular courses of instruction both in Birmingham and in London to undergraduate and graduate students. He also set up what was probably the first laboratory for the routine microanalysis of carbon compounds.

Drew was a man of many gifts and interests, among them an active interest in tennis and cricket, yet he never conquered his shyness and reticence to become well known even to his colleagues. The over-riding interest in his life was the practice of chemistry, and to those who had the opportunity of seeing him work at the bench, his skill with small amounts of material and his ability to extract pure crystalline products from the most unpromising material seemed uncanny. He was a man who practised his craft essentially for the satisfaction of accomplishment and not for any personal gain or reward. W. J. Hickinbottom