

a delayed-type contact hypersensitivity or with circulating antibodies. When especially powerful antigens were used abundant serum antibody was formed but inhibition of delayed hypersensitivity remained unaltered. Chase felt that present theories of tolerance would have to be amended so as to take these facts into account. In a most interesting contribution, M. Feldman explained that he and his colleagues had shown that the immunological responsiveness of sub-lethally irradiated rats could largely be restored by the injection of cells from normal animals together with the antigen (sheep red blood cells). This was also true for rats made unresponsive to human serum albumin by treatment with 6-mercaptopurine: immunological responsiveness could be restored not only with spleen cells but with cell-free extracts and DNA-digests as well. Feldman believed that these experiments were incompatible with the clonal theory of tolerance.

The final session was concerned with the question of cancer-specific antigens. The papers by K. Habel and H. O. Sjögren were beautifully complementary in demonstrating that the cells of tumours induced by polyoma virus possessed a new antigen which was foreign to the host. The experimental evidence was partly based on the observation that mice can be made resistant to the tumour by pre-treatment with the virus or with virus-induced tumour cells; but Habel also showed that resistance could be transferred with lymph node cells but not with serum from resistant mice, and that tolerance of the cellular antigen could be induced in new-born mice. In addition, Sjögren confirmed that methylcholanthrene-induced tumours, too, have a new cellular antigen. The antigenic properties of methylcholanthrene-induced tumours were discussed by R. T. Prehn, who stressed that, in contrast to polyoma virus-induced tumours, immunological cross-reactions among various tumours were rare. The fact that antigenicity was sometimes lost after repeated transplantation sug-

gested the possibility that non-antigenic tumour cell variants had been selected by a hostile environment. Prehn suggested that several experimental observations indicated that one of the principal facets of carcinogenic activity might be the suppression of immunological responsiveness by the carcinogens.

B. Björklund described the production in horses of a cancer-specific antiserum following sensitization with sixty human carcinomas. This antiserum was specific for human neoplastic cells because its cytotoxic activity was retained after absorption with normal human cells. Björklund's conclusion that human carcinomas are characterized by specific antigens was not accepted by all immunologists present.

W. Braun *et al.* claimed to have shown that DNA digests from calf thymus or the spleens of very young mice reduced the incidence of spontaneous tumours when injected repeatedly into young mice. Furthermore, pretreated mice rejected transplantable tumours obtained from untreated old mice—a finding which was complicated by the observation that the same animals died more quickly of growing tumours when challenged for a second time two months later. Finally, R. H. Wilson described a clinical study in which 32 patients with terminal malignant disease were injected with their own tumour cells emulsified with hyaluronidase and Freund's adjuvant. A rise in specific serum antibody titre occurred in 20 patients, and Wilson *et al.* concluded that a specific antigen must have been present in the neoplastic cells of these patients.

The symposium was attended by many hundreds of cancer research workers, and it undoubtedly succeeded in giving them an excellent bird's-eye view of the manifold new developments in immunology and cancer research. However, the very size of such a conference seriously limits the value of the discussions, and this is to be regretted.

LESLIE BRENT

## OBITUARIES

### Mr. Fred Scholefield, M.B.E.

FRED SCHOLEFIELD, who died on March 10 at his home in Hale, Cheshire, at the age of seventy-eight, and who spent almost the whole of his long professional life in the service of tinctorial technology, will best be remembered as the head of the Department of Textile Chemistry in the College of Science and Technology, Manchester, a department which he brought into being. He came late to the service of university education, for, after a meritorious performance as a student in the Departments of Chemistry and of Dyeing and Tinctorial Chemistry at the Yorkshire College (later the University of Leeds), he was for twenty-two years engaged in the industrial practice of textile dyeing and allied chemical treatments, becoming ultimately the chief chemist and works manager of Burgess, Ledward and Co., a large yarn-processing firm near Manchester.

In an old industry in which traditional usages and modern chemical and engineering discovery need to be promptly combined by the more enterprising firms, Scholefield foresaw more strongly than many of his generation the need for a much greater number of carefully and soundly trained technologists than seemed to be in prospect at the end of the First

World War. In 1926 he gave up his industrial position to join the Department of Applied Chemistry at the College, taking the place left vacant by the death of Edmund Knecht and the retirement of Julius Huebner. Soon after his arrival he was able to have a separate Department established, of which he was to remain the head until his effective retirement from academic work in 1951. During his régime the Department developed greatly in activity and importance, students came from many parts of the world and the record of research and teaching was very substantial taking into account the small numbers of his staff.

Scholefield's main interest in the field of dyeing research was in the oxidative changes brought about in cellulosic and other fibres when they were dyed with certain vat dyes, and activation occurred either by light or through other chemical agencies. Although later workers have extended our knowledge of the fundamental mechanisms on which these phenomena could be based, there is, even now, very little further understanding of the distinctive effects of specific dyes in actual textile products.

Scholefield was a lucid and inspiring teacher, a kindly, sociable and generous man, widely read and widely travelled, with many friends in Britain and

abroad. He had unusual powers of analysing a complex situation and giving his opinion in precise and graphic terms. This, coupled with his retentive memory and his liberal outlook, made him particularly effective in committee. During the whole of his professional life, he was an active member of the learned societies appropriate to his interests. He served two terms on the council of the Royal Institute of Chemistry and was chairman of its Manchester and District Section; he was a founder-member and past president of the British Association of Chemists and did a great deal of work to forward its interests with which he was greatly in sympathy. He was on a number of committees of the Textile Institute and the City and Guilds of London Institute, most of them concerned with technical education and professional status. The Textile Institute made him an honorary life member and awarded him the Institute Medal; the City and Guilds made him a special award of its insignia. The Society which made the strongest claims on his attention was the Dyers and Colourists, of which he was a member of council for many years and in the varied activities of which, local and national, he played a very special part. He held the Research Gold Medal of the Dyers' Company, the Society's own Gold Medal and was a honorary life member, and its president in 1950-51. One of his last public activities was as a member of the inter-society committee which organized the celebration of the Perkin Centenary. His former students, part-time and university, were widely scattered throughout the textile processing and allied industries in responsible positions, and during his later years he had many tokens of their gratitude and esteem.

On his retirement from academic life, he became technical adviser in Manchester to the Dyestuffs Office of the Board of Trade, and his wide knowledge of the dye-making and dye-using industries, with his many personal connexions in both, enabled him to give further valuable service to the tinctorial interests of Britain. For it he was made a member of the Order of the British Empire in 1959. In the past few years serious illness curtailed his activities; but on all occasions possible he attended at his office until final retirement in 1961.

He lived to see the Department that he founded increase greatly in size, equipment and numbers with the expansion of the College itself. He leaves behind many pleasant memories in all those who were his friends and associates.

H. A. TURNER

#### Mr. W. G. Kendrew

THE death on April 4 of W. G. Kendrew will be deeply regretted by climatologists and meteorologists throughout the world. For more than fifty of his seventy-seven years he took a great interest in climatology and his name soon became a household word in climatological circles. At Oxford, after taking a pass degree, he joined, in 1909, the teaching staff of St. Catherine's Society as classical don and eventually also as dean.

But Kendrew's main inspiration sprang from geography, in which in 1910 he gained with distinction the certificate and diploma. Geography at Oxford was then under Prof. A. J. Herbertson, who had transported personally to Britain the ideas prevalent in Germany on world climatic belts and

regions. It is probable that Kendrew was impressed by public criticisms of Herbertson's speculative global schemes (1912), such as the desirability of 'avoiding' wherever possible sharp boundaries to thermal zones; of using accumulated and extreme temperatures rather than averages; of taking account of rainfall and of evaporation, particularly from the human body. In any event, Kendrew turned to the more quantitative study of the climates of individual areas, and on these and climatic principles he lectured and tutored, with breaks for War service, from 1912 until 1950, the last ten years as reader in climatology.

Whatever he said or wrote reflected his classical leaning and his geographical enmeshment. It was highly intelligible, carefully and concisely phrased, and geographically rather than meteorologically applied; his use of quotations and his translations from foreign texts were brilliant; his technique of providing, prominently, but not too disruptively, a simple statistical basis to climatic phenomena inspired confidence. Consequently, the general public and the non-specialist student found his expositions attractive and most helpful.

His earlier climatic writings appeared in Herbertson and Howarth's *Survey of the British Empire* (1914). Within eight years these regional accounts had been extended to all the land-masses and *The Climates of the Continents* began its long career. The book aimed at filling a gap caused by the lack in English of any adequate description of the actual climates of the countries of the Earth, considered regionally. It was hailed as 'a pioneer work of its class' and of great value as bringing together in one volume a vast amount of information. A fifth edition, considerably revised and enlarged, appeared in 1961 and to date about 30,000 copies in all have been sold.

In the meantime, Kendrew, although well aware of the existence of several excellent works on the subject, compiled *Climate* (1930), a systematic account of the general principles of climatology treated mainly from a geographical and distributional point of view. A leading British meteorologist welcomed, *inter alia*, the valuable chapter on humidity and temperature in relation to the human body and thought the volume very readable and probably the best and then most up to date of its particular scope and purpose. What was virtually an extensively rewritten third edition appeared as *Climatology* in 1950 and was revised in 1957.

On retiring from Oxford, Kendrew worked for some years in Canada for the Government, in rewriting for general use the detailed reports by specialist investigators of climatic conditions in parts of that country. In 1955 the results, *The Climate of Central Canada* (with B. W. Currie) and *The Climate of British Columbia and the Yukon Territory* (with D. Kerr), evoked warm appreciation for the readily available data, the condensation of a vast mass of statistics, and the undoubted suitability for the general public of the illuminating and invitingly readable narrative.

Kendrew will long be remembered as an outstanding advocate and exponent of climatology, but his practical qualities should not be ignored. From 1935 until 1950 he directed the Radcliffe Meteorological Station at Oxford and he was a life-long connoisseur of weather and skylines. Partly in pursuit of climatic experience, he travelled widely, and for him there was always, besides meters and gauges, the human recorder, if possible in the form of Wilfrid George Kendrew.

R. P. BECKINSALE