

## OBITUARIES

### Professor Harold Burton

HAROLD BURTON, who died on September 1, aged 65, graduated from the University of Sheffield, and then spent 2 years in research with Dr. James Kenner on the influence of nitro-groups on the reactivity of substituents in the benzene nucleus. This was followed by 3 years on the staff of Burroughs Wellcome and Company. These early experiences gave him a life-long interest in the mechanism of organic reactions and in chemotherapy. His mechanistic outlook was further strengthened when, after a period of research in association with Professor C. S. Gibson for the Chemical Warfare Department, he joined the staff of Professor C. K. Ingold at Leeds in 1927. There he became responsible, during the next 20 years, for organizing the teaching of organic chemistry to medical students. For this his earlier work, including that with Gibson at Guy's Hospital, was a very good preparation.

In collaboration with the Department of Physical Chemistry two most successful courses were designed which enabled students of medicine in later years to keep abreast of the rapid advances on the chemical side of their profession. It was typical of Burton that, while preparing the course, he attended the lectures of the professor of physiology. Both students and senior members of the Faculty of Medicine greatly respected him and deeply appreciated his devotion to their interests.

After the appearance of a joint paper with Ingold in 1928, on mobile anion tautomerism in the simple three-carbon system, he continued to work on this subject for some years; later, in collaboration with Shoppee, this research was extended to *cyclopentanonones*.

Between 1940 and 1948 he published a series of papers on aromatic and heterocyclic sulphonyl derivatives which were an outcome of his contacts with the pharmaceutical industry and with his medical colleagues. His work on complex formation and re-arrangement of *p*-hydroxylaminobenzenesulphonamide clarified some unexplained observations of earlier workers and afforded evidence of his ability to elucidate a series of obscure reactions by some neat and simple experiment. This was further illustrated by his work on the formation of diphenyl sulphoxide from thiophen-2-sulphonyl chloride and magnesium phenyl bromide.

In 1947 Burton succeeded Professor C. K. Tinkler in the chair of chemistry at King's College of Household and Social Science (later re-named Queen Elizabeth College) in the University of London. During the following years the College developed considerably and has recently embarked on a new building scheme. In collaboration with Dr. F. G. Praill he commenced a lengthy study of acylation and similar reactions in which he utilized the acetylum and acetic anhydridium ions,  $\text{CH}_3\text{CO}^+$  and  $(\text{CH}_3\text{CO})_2\text{OH}^+$  in the form of their perchlorates. He showed that mixtures of acetyl chloride and silver perchlorate readily acylate anisole giving *p*-methoxyacetophenone, and that benzyl perchlorate gives diphenylmethane with benzene.

Burton served the profession of chemistry in many ways. He was one of the honorary secretaries of the Chemical Society from 1949 to 1955, vice-president of the Royal Institute of Chemistry from 1951 to 1953 and its honorary treasurer from 1953 to 1963; he also gave much service to the Bureau of Chemical Abstracts. This may have contributed to some extent to his extremely wide knowledge of organic chemistry which was aided by his early interest in reaction mechanism.

Burton was an expert gardener, and his neat handwriting was in keeping with his teaching, his research work and his administration. A colleague said recently—"he was the epitome of reason and good sense".

FREDERICK CHALLENGER

### Dr. James Powell

DR. JAMES HUGH POWELL died on September 28 after a short illness. He had retired from the Admiralty in 1954 after 38 years service devoted to the study of underwater weapons and their effect on ships' structures.

He was educated at the University of Liverpool and was for a short time on the staff as demonstrator and lecturer in physics. He joined the Admiralty shortly after the outbreak of war in 1914, working first with Rutherford, and then with W. H. Bragg on the problem of submarine detection using directional hydrophones. Later he worked on the motion of buoyant mines in tideways, but his real life work on the recording of the pressures from underwater explosions using piezo-electric gauges began with his association with Dr. A. B. Wood. This was an ambitious undertaking in those days; the cathode-ray oscillograph had only just been developed and amplifiers that would deal properly with a "once-only" steep fronted type of pulse simply did not exist. This meant that all the early work was done with very heavy tourmaline gauges in order to give enough voltage and charge to actuate the oscillograph directly. In a sea trial the problems of adequate cable insulation and of positioning such gauges accurately could be very severe. They obtained reliable results and established that the pressure due to a given charge could be predicted to within a few per cent.

The situation did not really change until the last war, when reliable amplifiers became available, permitting the size of gauges to be reduced. Smaller and more robust gauges could then be brought nearer to the charge without damage. Powell played a leading part in directing this development, and the fact that the British contributions to this field match the results obtained by the United States with much more manpower is largely due to him. He was a 'founder member' of the Naval Construction Research Establishment at Rosyth. Although not a theoretician, he followed the theoretical work on the hydrodynamics of the pulse itself and on the damage to ships' structures which was carried out during the last war, and was always helpful in devising experiments to check difficult points. He made important contributions to the vital problems of how to scale up from model experiments and of how to arrive at numerical measures of 'damage'.

Powell's personality was marked by absolute loyalty and unflinching courtesy to those both below and above him. This was combined with the humility and the willingness to listen to everyone that mark the true researcher. These qualities brought him many friends, some of whom feared that his retiring nature was ill-suited to the rough and tumble of Civil Service politics. He certainly did get less than his real due; he even declined a promotion on one occasion! Nevertheless, he was able to do work of permanent value in organizing the Admiralty branch of the Institution of Professional Civil Servants, in which he became a leading figure.

Admiralty research establishments necessarily employ a wide variety of people, naval types active and retired, professional administrators, naval constructors, scientists and engineers of every type whose trainings are so different that real communication problems can arise and can reach a point at which the efficiency of the work suffers severely. Powell was a past master at smoothing away these difficulties. He had great tact and the imagination to see almost every point of view.

He is survived by a widow, a son and a daughter.

H. N. V. TEMPERLEY