# OBITUARY

## Prof. C. T. R. Wilson, C.H., F.R.S.

At the time of his death, and in relation to date of election, Charles Thomson Rees Wilson was senior Fellow of the Royal Society by four years. He was elected to the fellowship in 1900, and, indeed, of those elected in the decade 1900–10, only three survive him. He received the Hughes Medal in 1911, a Royal Medal in 1922, and the Copley Medal in 1935. Eight years previously he had shared the Nobel Prize for Physics with A. H. Compton. This bare recital of fact tends to obscure the man in the record of history: it closes in the year which followed his retirement from the Jacksonian professorship at Cambridge, and his return to Edinburgh—and Scotland. It obscures C. T. R. the man, who endured, until the end, bright-eyed, nervously alert, long of stride, young of heart, serene through a quarter of a century of conflict and change which passed him by.

His years of retirement were not empty. Soon after his eightieth birthday, he moved from Edinburgh to the village of Carlops, close to his birthplace at the farmhouse of Crosshouse, at Glencorse; but regularly thereafter he made the journey to the city by bus so that he might lunch with friends, physicists and others, many of half his age or younger, once a week in a crowded restaurant. Scientifically, too, his retirement was fruitful: some four or five years ago he began again to write the long-promised account of his theory of thundercloud electricity, and finally, on April 27, 1956, the manuscript was lodged with the Royal Society. It was published in the *Proceedings* in August of the same year: twenty pages of closely reasoned statement—emphatically a work of the present, not of the past. Nor was he home-bound: he attended a dinner in his old college at the time of his eightieth birthday and, when the reactor *Dido* was inaugurated at Harwell in November 1956, he was among the guests. It was my privilege to be his travelling companion on that November day. Rising about 5.30 a.m., he was in Edinburgh soon after seven; we made the return journey to London Airport by B.E.A. *Viscount*; it was nearly 11 p.m. before he was home again. In the meantime, everything that there was to be seen he had seen; he had climbed all the ladders and looked into all the peep-holes; there had been a diffusion cloud-chamber working, and he had seen that too. He was delighted. Only one discontent clouded his joy. Travel by civilian air-liner was not overmuch to his liking. His preference was for the rigours and the excitement of the ancient *Anson* of the weather flight, in which he was flying as a student whenever occasion offered, an honorary member of the meteorology class of the University of Edinburgh. Such flights were a recurring delight of his last years, taking him to the north-west, over the outer isles, in fine weather and foul.

C. T. R. lived to become a legend: for me he was already legendary nearly forty years ago. The headmaster of my Yorkshire grammar school had been head of the science side at Bradford in the 1890's, and there, for a brief spell, C. T. R. had endeavoured to instruct the young, soon after he had graduated at Cambridge in 1892. In later years, when he had retired from Bridlington, Arthur Thornton reminded the authorities of his former school of a forgotten episode of its history, how for a little while it had numbered among its staff a future Nobel prizeman—and had not known his worth.

Wilson's father died when he was four years old. Thereafter his mother moved to Manchester, and C. T. R., intending to become a doctor, entered Owens College to study biology. Balfour Stewart (an Edinburgh man) was professor of physics at the time. A dozen years previously, or thereby, J. J. Thomson had passed through his class on his way to Cambridge. C. T. R. went on to Cambridge, also: to Sidney Sussex College, with an entrance scholarship. Not until then did his interest veer to the physical sciences; but once the decision had been taken, that he should abandon medicine, there was no turning back. By the beginning of 1895 he had already started on what was to prove his major work. It was an unlikely beginning for a fundamental research, yet, after thirty years, it was to fill the physical laboratories of the world with an apparatus which, for a generation, did more to speed the progress of experimental physics than any other agency.

In 1895, Wilson was merely attempting "to imitate in the laboratory" the 'glories' which he had seen on the summit of Ben Nevis in the late summer of the previous year. But he had a sharp eye, and a keen mind, and he had been working for no more than a few months before his interest became engaged in the few drops which reappeared time after time continually, as often as he chose to expand a volume of moist, dust-free, air by more than a 5 : 4 ratio. He seized the significant conclusion that in such circumstances condensation nuclei must be being produced continuously throughout the sample of air. This observation could not have been made at a more opportune time—or in a more suitable place. In December 1895 news of Röntgen's discovery startled the world; towards the end of the following month, in Cambridge, Thomson and McClelland discovered the conductivity imparted to air by the passage of X-rays. Old knowledge concerning the slight 'residual' conductivity of the atmosphere now began to fit into place, and it was with 'delight', but scarcely, one imagines, with surprise, that Wilson found his 'rain-like' condensation enormously increased when he exposed his primitive cloud chamber to the new rays. This was in February 1896. The hypothesis that the conductivity was due to gaseous ionization was firmly established by Thomson and Rutherford during the summer of that year. Thereafter no one doubted that gaseous ions could be fixed in this manner—by condensing water vapour on them, through the process of adiabatic expansion.

Characteristically, Wilson did not himself become involved, at that time, in the excitement of the new investigations into the other properties of X-rays or of the Becquerel radiation. Instead, he carried out a full investigation of the details of the condensation phenomenon and, with simple apparatus, but sure insight, a thorough study of the residual ionization in air and other gases. Then, in the early years of the century, he turned to different problems, and an increasing load of advanced teaching came to

occupy his time. In 1910 a second phase of interest in the cloud apparatus followed, and early in 1911, for the first time, the tracks of individual α-particles and electrons were seen and photographed. The paths of the α-particles were just as W. H. Bragg had drawn them, five years previously, and the tracks of the electrons "little wisps and threads of clouds". This achievement was widely—and justly—acclaimed but, strangely, the literature of the period provides little evidence that others elsewhere sought to emulate Wilson's success.

The situation was entirely different after the third phase of Wilson's own interest. By 1923 he had finally brought to perfection this most remarkable method of experiment. The photographs of electron tracks with which he illustrated two classic papers published in that year were of such quality—and beauty—that the cloud chamber could no longer be dismissed as an amusing toy. All over the civilized world workers built themselves the necessary equipment. In Cambridge, Blackett and Kapitza; in Paris, Irène Curie and Auger; in Berlin, Bothe and Meitner and Philipp; Skobelzyn in Leningrad; Kikuchi in Tokyo—all within a very few years were operating Wilson cloud chambers with signal success. This was but the beginning of the story, and it is pointless here to continue it. Whoever turns the pages of a physical journal of the past thirty years will see for himself something of what the harvest has been: he will appreciate the abundance of it even more clearly if he turns the pages of "An Atlas of Typical Expansion Chamber Photographs" (1954), with its dedication to "C. T. R. Wilson, whose invention of the cloud chamber made these photographs possible", and its frontispiece reproducing his portrait by James Gunn. There could be no better *Festschrift*.

Wilson gave to physicists in general a sharp tool for research, second to none. By contrast, he gave to very few of them his personal guidance, as director of their individual researches: to Wormell, in the general field of atmospheric electricity (in this notice Wilson's contributions to this field have no more than been hinted); to Powell and Dee and J. G. Wilson in cloud-chamber studies; so the list is almost complete. Too much must not be made of this distinction: whether he be of the select few, or of the many, every physicist who has ever operated a cloud chamber must acknowledge his debt. It cannot be measured in words.

C. T. R. Wilson was born on February 14, 1869. He died on November 15 in the midst of his family. Mrs. Wilson, his son and two daughters survive him.

NORMAN FEATHER

# NEWS and VIEWS

## British Ceramic Research Association: Dr. A. T. Green, C.B.E.

DR. A. T. GREEN retires from the directorship of the British Ceramic Research Association on December 31, after thirty-eight years service to the ceramic industry, during which time he has established himself as one of the world's leading ceramists. An old boy of Hanley High School, he joined Dr. Mellor at the British Refractories Research Association after the end of the First World War and quickly became associated with work on refractories for the steel and gas industries, and by his incisive attack on the problems he then encountered he laid the foundation for future developments, the benefits of which are still being reflected in the economics of those industries. He was made assistant director in 1931 and succeeded to the directorship on Dr. Mellor's retirement in 1937. After the Second World War, Dr. Green, who had been made O.B.E. for his contribution to the war effort, was charged with the task of uniting the British Refractories Research Association and the British Pottery Research Association to form the British Ceramic Research Association, and he took up the directorship in 1947. The Association's main laboratories in Queens Road, Penkhull, opened in 1951 by the Duke of Edinburgh, were planned under Dr. Green's direction, and the steady output of research papers—more than 400 have been published since 1948—is a tribute to the inspiration with which he has led his team of research workers. Dr. Green has been able to see, before his retirement, the completion of another laboratory block—to be named the Mellor-Green Laboratories—which is to serve the structural clay products branch of the ceramic industry. Dr. Green was made C.B.E. in 1957, and was awarded the degree of D.Sc. *honoris causa* by the University of Leeds in 1949. He is an honorary member of the Institute of Gas Engineers and of the British Ceramic Society; the latter he has served as honorary general secretary for the past twelve years. He was one of the founders of the Institute of Ceramics and was its first president.

## Dr. N. F. Astbury

DR. N. F. ASTBURY, who has been deputy director since 1957, will succeed Dr. Green. Dr. Astbury was a scholar of St. John's College, Cambridge, where he obtained first-class honours in both parts of the Natural Sciences Tripos. After leaving Cambridge, Dr. Astbury was for ten years on the staff of the National Physical Laboratory, and at the outbreak of war went to the Anti-Submarine Experimental Establishment. In 1945, he entered industry to become director of research of the firm of Joseph Sankey and Son, Ltd., and then director of research to the Guest Keen Nettlefold Group of Companies, of which Sankeys is a member firm. During this time Dr. Astbury planned the central research laboratory for the group, which has now been established in Wolverhampton for ten years. Since 1949 Dr. Astbury has held two professorships—one, the chair of applied physics in the University of New South Wales and the other in the University of Khartoum, where he was also dean of the Faculty of Science. For a short time before joining the British Ceramic Research Association he was at the Royal Aircraft Establishment, Farnborough. Dr. Astbury was awarded his Sc.D. by the University of Cambridge in 1954. He serves on the Education and Membership Committee of the Institute of Physics and on the Advisory Board of the *Journal of Scientific Instruments* and the *British Journal of Applied Physics*, and he is also a member of the Board of Studies of the National Council for Technological Awards.