National Subcommittee on Seismology, and was for several years a member of the Council of the Royal Society of New South Wales. In these and related offices he gave of his best.

His published work includes seven papers on seismology, the last of which appeared in the *Australian Journal of Physics* shortly after his death. The papers were concerned with the seismicity of Australia, the problem of detecting *S* waves in the Earth's inner core, special phases from New Zealand earthquakes, and seismic aspects of nuclear explosions. The last work has attracted world-wide attention.

Father Burke-Gaffney was born in Dublin on December 26, 1893, and entered the Jesuit order in 1913. He took up residence in Australia in 1928 as senior science master at St. Ignatius's College, Riverview, Sydney, and in 1946 became assistant director of the College Observatory. He lived austerely, and was one of Australia's most unassuming scientists and a man of quiet, gentle dignity. Few outside his College friends and his seismological colleagues got to know him well; but those of us who did, knew him as a charming liberal-minded man graced with a delightful humour and who dedicated himself to his work.

K. E. Bullen

NEWS and VIEWS

Nobel Prize for Medicine and Physiology : Prof. J. Lederberg ; Prof. G. W. Beadle and Dr. E. L. Tatum

The recent award of the Nobel Prize for Medicine and Physiology for 1958 to Prof. Joshua Lederberg, and jointly to Prof. G. W. Beadle and Dr. E. L. Tatum, is a signal acknowledgment of the great advances which have been made in knowledge of the genetics of micro-organisms in recent years, and of the importance of this knowledge to an understanding of living processes in general.

The main contribution of Beadle, the geneticist, in collaboration with Tatum, the chemist, was to show first, in 1941, that mutations induced by irradiation in the mould *Neurospora crassa* resulted in inability to synthesize specific chemical nutrients which the organism needed for growth. Genetic crosses between the mutant and parental strains invariably showed that each mutant strain, having a single specific requirement, differed from the parental strain by alteration of only a single gene. Thus single genes appeared to control single biochemical reactions and, by inference, the formation of single enzymes. This first successful attempt to relate genetic and biochemical function experimentally gave birth to the stimulating 'one gene, one enzyme' hypothesis and initiated the expanding field of biochemical genetics. In further studies Beadle and Tatum traced the synthetic defects of some of their mutant strains to inability to perform various specific intermediate steps in the chain of processes leading to formation of such required end-products as amino-acids or vitamins of the B group. By wedding experiments with such mutants to inspired guess-work concerning presumptive precursors in biosynthesis they, and many subsequent workers, have built up a formidable mass of knowledge about intermediary metabolism.

Tatum (1944–46) extended these *Neurospora* studies to bacteria. As a result, a considerable stock of nutritionally defective mutant strains of *Escherichia coli* were developed. Lederberg, who was working with Tatum at this time, conceived the idea that these mutants might be used to provide a definitive test of the occurrence of sexuality in bacteria. The experiments were immediately successful and were first reported jointly by Lederberg and Tatum in 1946 in *Nature*. Subsequent studies by Lederberg proved the existence of a linear linkage between many of the genes of *Escherichia coli*, thus showing, for the first time, that bacteria are fundamentally similar to other types of cell in their genetic and biochemical constitution. These studies, which then appeared to S. E. Luria "to be among the most fundamental advances in the whole history of bacterial science", served as the starting point for many far-reaching discoveries in the field of bacterial genetics which Lederberg has ever since continued to fertilize with new ideas and techniques. In 1952, he and Dr. N. D. Zinder showed that certain bacterial viruses (bacteriophages) could act as vectors of small fragments of bacterial chromosome from one cell to another so that recombinant types arose : development of this discovery, especially by Dr. M. Demerec and his colleagues, has provided important new concepts about the fine structure and function of the gene. In 1953, Lederberg and his wife, Dr. Esther M. Lederberg, simultaneously with Dr. E. Wollman of the Pasteur Institute, Paris, first proved that the genetic material of a bacterial virus of low virulence might attach itself to a specific site on the bacterial chromosome and thereafter be propagated indefinitely among the progeny of the host cell as though it were part of its normal hereditary constitution. Lederberg and his wife also developed a simple but elegant technique, known as 'replica plating', which, in addition to its wide applicability as a laboratory tool, was used by them to demonstrate directly, for the first time, that bacterial mutations, such as resistance to certain antibiotics or viruses, arose spontaneously and not in response to environmental stimuli.

Royal Society : Medal Awards

The following awards of medals have been made by the President and the Council of the Royal Society : *Copley Medal* to Prof. J. E. Littlewood, lately Rouse Ball professor of mathematics in the University of Cambridge, for his distinguished contributions to many branches of analysis, including Tauberian theory, the Riemann zeta function, and non-linear differential equations ; *Rumford Medal* to Sir Thomas Merton, formerly professor of spectroscopy in the University of Oxford, for his distinguished researches in spectroscopy and optics ; *Davy Medal* to Prof. R. G. W. Norrish, professor of physical chemistry in the University of Cambridge, for his distinguished work in chemical kinetics, especially in photochemistry ; *Darwin Medal* to Sir Gavin de Beer, director of the British Museum (Natural History), for his distinguished contributions to evolutionary biology ; *Sylvester Medal* to Prof. M. H. A. Newman, Fielden professor of mathematics in the University of Manchester, for his distinguished contributions to combinatory topology, Boolean algebras and mathematical logic ; *Hughes Medal* to