OBITUARIES

Sir Gilbert Walker, C.S.I., F.R.S.

Sir Gilbert Walker died on November 4, some four months after his ninetieth birthday. For half a century his has been a prominent name in meteorological circles, and in recent years one was apt to forget that he had been elected a Fellow of the Royal Society for original work in dynamics and electromagnetism before ever he turned his thoughts to meteorology.

Walker went up to Trinity College, Cambridge, from St. Paul's School with a mathematical scholarship. He fully confirmed his early promise on graduating as the Senior Wrangler in the Mathematical Tripos of 1889, an achievement that was followed in due course by election to a fellowship of Trinity and then to a lectureship, both of which he held until going to India. From 1892 onwards he published a series of papers on the theory of electromagnetism, for one of which he was awarded an Adams Prize in 1900. In the same period he was showing a keen interest in dynamical problems, with papers on such subjects as the motion of elongated projectiles, dynamical tops and boomerangs, in which his interests were not wholly theoretical, for he became expert as designer and thrower of boomerangs, and indeed was known in the Cambridge of those days as 'Boomerang Walker'. It is a matter for some regret that his article on "Spiel und Sport" in the great "Encyklopädie der Mathematischer Wissenschaften" was never well known to his own compatriots.

Walker went to India in 1903 to succeed Sir John Eliot as director-general of observatories. The great Indian famine of 1899–1900 was still very much in people's minds and, as it were, challenged Walker to attempt to solve the very complex and difficult problem of forecasting the monsoon rainfall. The physical causes that produce the fluctuations from year to year defied and still defy detection. Walker decided to apply the statistical methods of correlation and soon made the subject of seasonal 'foreshadowing' by these methods peculiarly his own. His investigations, beginning with the search for relationships between previous weather over different parts of the globe and the Indian monsoon rainfall, developed into an examination of the interrelations of world-wide variations of weather, contemporary and consecutive. His papers are a mine of statistical information on world weather, interspersed with concise, critical and acute comment. Of the more important generalizations that emerged, there was one that he called the Southern Oscillation, which may be described as a tendency for air to disperse from the Pacific area at the same time as air accumulates in and around the Indian Ocean. The monsoon plays a part in the Southern Oscillation, out of the elements of which he evolved a formula for 'foreshadowing' monsoon rainfall, which has continued in use in India with but little amendment. Walker would not claim to have solved the monsoon problem, but he pointed a way, and the value of these papers can scarcely be overestimated.

Living in the Simla hills, Walker was fascinated by the soaring flight of birds, at first as a hobby, then as a study on which he wrote several papers, including the article in the "Encyclopædia Britannica" on animal flight.

After retiring from India in 1924, Walker succeeded Sir Napier Shaw as professor of meteorology at the Imperial College of Science and Technology, London. One of the subjects to which he turned his own and his pupils' attention was the cellular structure of an unstable fluid. In striking laboratory experiments they obtained a variety of cellular forms—polygons, transverse and longitudinal vortices—by varying the rate of shear in the fluid, and they were able to show that this physical process explained the mode of formation of a wide variety of cloud forms.

Walker lived in Cambridge from 1934 until after the Second World War, officially retired but continuing to write papers on meteorological subjects. During the War he acted, in effect, as an honorary consultant on problems of long-range forecasting.

Walker was a man of wide interests, a highly proficient skater and climber in his younger days, always very fond of music, happy to spend a day out of doors sketching in water colour, ever eminently reasonable, liberal minded and very friendly. In all his posts he demonstrated his great intellectual capacity and served with distinction, deservedly reaping many honours during his long life.

Charles Normand

Mr. Stephen Butterworth, O.B.E.

Stephen Butterworth died on October 28 at the age of seventy-three at his home in Cowes, Isle of Wight, having retired from the Admiralty scientific staff in 1945.

After being educated at the University of Manchester, Butterworth was for eleven years a lecturer in physics at the Manchester Municipal College of Technology. Afterwards he worked for a few years on electrical standards at the National Physical Laboratory before joining the Admiralty Research Laboratory in 1921, where he remained for twenty-four years until his retirement.

Butterworth was a first-rate mathematician who possessed the rare ability to apply his mathematics successfully to a wide variety of practical problems. Before his Admiralty period he was mainly concerned with electrical investigations such as the theoretical determination of standards of inductance and accurate methods of measurement. This work, unlike much of what he did later, was fully published in the scientific Press, and his theoretical formulæ for inductances and the high-frequency resistance of coils have been extensively quoted and used.

His achievements with the Admiralty are too numerous to mention in detail, but the following indicate the diversity of his activities. In his early days he studied the possibilities of ship navigation by the use of a 'leader cable'; and, by solving the complicated electromagnetic field surrounding a submarine cable carrying alternating current, he was able to provide a complete theoretical background for all subsequent design work. He concerned himself with underwater weapons and made valuable contributions to our understanding of the stability of torpedoes