

Committee for Aeronautics, the forerunner of the present Aeronautical Research Council, during 1909–20, and it is impossible to measure the full extent of his advice and guidance in that body. He was a past-president of the Institution of Automobile Engineers, and held all three medals, the bronze, silver and gold, of the Royal Aeronautical Society. He delivered the Wilbur Wright Memorial Lecture to that Society in 1926.

Perhaps only those who were privileged to be intimate with Lanchester knew that he was also a poet, and had published two volumes of verse under the name of 'Paul Netherton Herries'.

The debt that the world of science, particularly aviation, owes to Lanchester has never been fully acknowledged, and it is a melancholy fact that we have had to wait for his death to prompt some of his associates to suggest the institution of some form of memorial to his memory. F. T. HILL.

Mr. Alfred Lucas, O.B.E.*

'BENCH-MARKS' established by Lucas are to be found in such various fields as the study of ancient and modern Egyptian materials and industries, the soils and waters of the Nile, the preservation and reconstruction of Tutankhamun's treasures, trials and courts-martial, and the route of the Exodus. He was a pioneer of modern science in Egypt, alert and precise, applying the severe discipline and manipulative skill of analytical chemistry with so deep a comprehension of essentials that he was neither dilettante nor don. Kindly to ignorance but merciless to fraud, he made even his smallest contributions into facts of historical importance for students of the many subjects which he illuminated. His encyclopædic local knowledge was conspicuously useful to England on the Scientific Advisory Committee to G.H.Q., M.E.F., especially during 1940–42, when Service supplies had often to be improvised locally. At the age of seventy-eight, while about to attend a commission on the state of the Theban tombs, he died in Luxor on December 10.

Lucas was born at Manchester on August 27, 1867, and went from private schools to the Royal College of Science and School of Mines in London. After eight years as assistant chemist at the Government Laboratory in London, he went to Egypt in 1897 for reasons of health. Egypt's climate arrested his tuberculosis, and in May of 1898 he joined the Salt Department as chemist under Mr. A. H. Hooker. A year later he left voluntarily when this department became the Salt and Soda Company, to be chemist to the Survey Department under Captain (later Colonel Sir Henry) Lyons in March 1899. Lyons built a small three-room laboratory in the garden of the Public Works Ministry, to which the Survey then belonged, and put Lucas in charge. The laboratory grew rapidly beyond its original purpose of analysing minerals; in 1912 it took over and re-organised the Assay Office, becoming a separate department called the Government Analytical Laboratories and Assay Office, with Lucas as director. Later it became the Chemical Department. Lucas resigned voluntarily on reaching the minimum age limit in March 1923. For help given by these Laboratories to the military authorities during 1914–18 he was awarded an O.B.E.; from Egypt he received the third order of the Nile, and the fourth of the Osmania.

Retirement meant only that Lucas continued his favourite pursuits with renewed vigour, and in the

following months he was attached to the Antiquities Department, as chemist, until 1932. His services were lent to Howard Carter for cleaning and preservation work on the wealth of objects which had been found in the tomb of Tutankhamun, and for nine winters Lucas lived and worked at Luxor on them. The rest of each year was spent on other work at the Museum in Cairo. He helped to put the seventeen hundred objects on exhibition and, years afterwards, to store them against possible bombing and to bring them back to the exhibition rooms. His diplomatic abilities were freely exercised during those nine years. In 1932 his contract was not renewed, so he remained at the Museum doing voluntary work until December 1934, when he was given official status again with a small salary, after which he became honorary consulting chemist.

Apart from numerous contributions to chemical and archaeological journals, Lucas published three books which are in steady demand. "Antiques, their Restoration and Preservation", in two editions, incorporated his practical experience and many devices. "Forensic Chemistry and Scientific Criminal Investigation" ran to four editions and a reprint; it revises several accepted beliefs, especially in ballistics. He had a wide experience as an expert witness, and during most of the Second World War he averaged two courts-martial a week, British or American, in spite of long-standing angina pectoris; he was not a witness to browbeat, for in pursuit of truth he would be outfaced by no man.

The third book, which is proceeding to a posthumous third edition, is perhaps Lucas' most important one. "Ancient Egyptian Materials and Industries" is amazing in its accuracy, fully documented with reference to every detail (though he was his own secretary) and gives short shrift to any archaeological mis-statements. The direct experimental work which he had done for checking purposes ranged from mummification to the re-discovery of faience manufacture.

A small book on the "Route of the Exodus" is interesting as an example of close reasoning on topography, meteorology, and probability applied to the account given in the Old Testament. Two delightful little booklets on the history of Egypt and Libya were printed and distributed free to military clubs and hospitals during the War.

Scarcely any learned man did more for the troops in the Middle East during the War, showing them the interests which exist behind the unattractive modern façade of Egypt, by broadcasts, lectures, and demonstrations. All this was done at his own expense, and he told with glee how, for one appointment at a far-off camp during the early days, he was fetched in a loaded lorry but sent home in a staff car. His first broadcast lecture had been when the trumpets of Tutankhamun were heard by the world in April 1939. Taking parties of 'other ranks' through the Cairo Museum after it re-opened was one of his chief pleasures, with willing answers to every possible kind of question.

The scope, volume, and quality of his scientific work is realized by only a few of us, but it will be many years before research workers can afford to overlook any of his careful results and his balanced opinions.

W. L. BALLS.

The late R. ENGELBACH.

D. S. GRACE.

H. E. HURST.

L. F. MCCALLUM.

* See also *Nature*, Jan. 26, p. 98.