1948–50, and in 1955 made an extensive study tour of the United States of America under the auspices of the Foreign Operations Administration.

In the Gold Coast, Charter developed a new technique in soil survey, employing methods adapted from those used in ecological surveys. Soil, vegetation and land-use were sampled or recorded at regular intervals along traverse lines and at regular intervals across the grain of the topography. Soils were mapped by topographical associations, but within each of the latter, sample strips a mile long by a quarter mile broad were mapped in complete detail to illustrate the soil, vegetation and land-use patterns occurring. Such work involved the use of large numbers of semi-skilled local assistants, the majority of whom Charter had to train himself.

One important detail of the procedure evolved by Charter was the orderly preservation of samples of soil and rock and the regular comparison of each day's findings with the selected standard samples. He was fortunate in that all his African junior assistants could read and write English; their work, however, was closely checked by those with better education or longer experience. The work was done with accuracy and enthusiasm and was generously supported by the Gold Coast Government, which constructed at Kumasi excellent laboratories and offices for Charter's department. At the time of his death, the department had an establishment of some twenty professional staff and 150 junior technical assistants of varying grades.

At the Cocoa Conference of 1949 Charter described the principal cocoa soils of the Gold Coast and discussed the phenomenon of soil creep occurring there and in Central America and the West Indies. After a visit to Tanganyika in 1950, he came to realize that many tropical soils were not truly sedentary but had developed in 'drift' parent materials. In a paper submitted to the Conference of the Consultative Committee for Tropical Africa on the mechanization of agriculture (Entebbe, 1955), Charter advocated bush fallows for maintenance of fertility in peasant agriculture. In an important paper presented at the Cocoa Conference of 1955 he noted that in the Gold Coast cocoa had failed to survive on acid soils ('oxysols') deficient in divalent bases, but had survived on the less acid and more fertile 'ochrosols'. He stressed the importance of including magnesium in fertilizer trials with cocoa. Charter associated the 'oxysols' with the reddish-yellow latosols of Kellogg and Davol (1949). He noted that the relatively infertile 'oxysols' are formed, where annual rainfalls exceed 70–80 in., from the weathering products of highly siliceous rock (quartzites) or from those of pyritiferous sediments which set free sulphuric acid during decomposition. In fact, appreciable amounts of sulphate in the subsoil of Gold Coast 'oxysols' had been found by the analyses of Charter's colleague, A. S. de Endredy (unpublished observation). A brief statement of Charter's views on the broader aspects of soil classification is given in the Proceedings of the Fifth International Congress of Soil Science (4, 497–499). A further account of Charter's views has been prepared for the Sixth International Congress of Soil Science by his colleague, H. Brammer.

Charter was born on December 4, 1905. A son and daughter, children of his first marriage, survive him.

HERBERT GREENE

NEWS and VIEWS

Metallurgy at Leeds : Prof. N. J. Petch

THE Department of Coal, Gas, and Fuel Industries with Metallurgy in the University of Leeds is to be re-organized into the three Departments of Fuel, of Chemical Engineering and of Metallurgy. Collectively they will form the Houldsworth School of Applied Science. Dr. N. J. Petch, at present reader in metallurgy, has been appointed to the new chair of metallurgy created during this re-organization.

After taking a degree in chemistry at Queen Mary College, London, in 1936, Dr. Petch spent a year studying engineering and then read metallurgy at the University of Sheffield, where he took his B.Met. in 1939 and was awarded the Mappin Medal. This varied training was completed by three years as a research assistant in the Crystallographic Department at the Cavendish Laboratory. His researches during this period culminated in papers on the positions of the carbon atoms in cementite, austenite and martensite. Dr. Petch then went to the Royal Aircraft Establishment, where he organized a new section of the Metallurgy Department, dealing with X-ray diffraction problems and routine radiography. He also began to take an interest in the field of fracture in metals, with which his name is now particularly associated. Initially this interest was stimulated by investigations of the mechanism of the hydrogen embrittlement of steels; but during the period 1946–49 which Dr. Petch spent in the Cavendish Laboratory with the team led by Dr. E. Orowan, his interests widened to include many fundamental aspects of fracture. Since 1949, when he was appointed reader in metallurgy in the University of Leeds, Dr. Petch has continued his studies of fracture and has published many important papers in the field. A problem common to all university departments teaching the applied sciences is to maintain an adequate balance in lectures between the rapidly expanding new knowledge and the established classical material. Dr. Petch, who is responsible for the teaching courses in metallurgy, has, during the tenure of the readership, carried out a careful re-organization to maintain the balance.

Geography at Liverpool : Prof. R. W. Steel

MR. R. W. STEEL has been appointed John Rankine professor of geography in the University of Liverpool as from January of next year, a post which has been vacant since the death in 1955 of Prof. W. Smith. Mr. Steel has spent his academic life in Oxford. He was an open exhibitioner of Jesus College, Oxford, and while still an undergraduate won the Royal Geographical Society's Essay Prize in 1936. In 1938, he was Draper's Research Scholar and carried out some research work in Sierra Leone. He made a second expedition to West Africa, jointly with an economist and an anthropologist, during 1945–46, and has recently returned from a further visit to Central Africa and East Africa. He has for many years been lecturer in Colonial geography in the