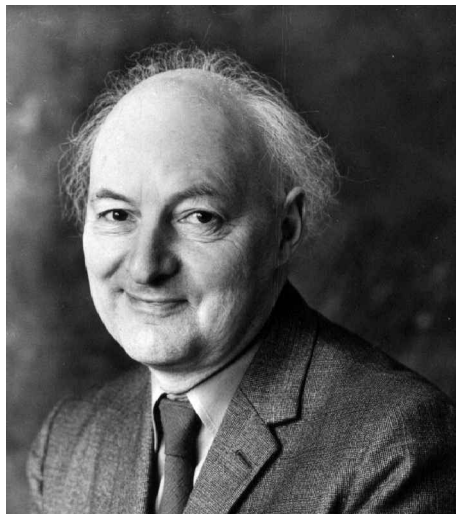


## DOUGLAS MACLEAN CLARK MACEWAN 1917–2000



With the death of Douglas MacEwan on 12 March 2000, at the age of 82, we have lost a scientist of brilliant intellect who made seminal contributions to so many fields. Yet he never reached his full potential in material terms because of the diversity of his interests, his restless spirit and his inability to resist new challenges.

Douglas was born in Edinburgh on 20 June 1917. He was educated at Craighend Park School, a private school where the excellent science teaching inspired him to follow a scientific career. Entering Edinburgh University at the age of 16, he graduated MA, BSc with honours in Physics before undertaking X-ray crystallographic research under Dr C.A. Beevers at the Chemistry Department. In 1941 he graduated PhD for a thesis entitled (a) *A machine for the rapid summation of Fourier series*; (b) *An X-ray investigation of sulphuric acid monohydrate*. The machine, an ingenious, early, single-purpose electric calculator (*J. Scient. Instrument.* 1942, **19**, 150–156) was advanced for its time and excited considerable interest from eminent X-ray crystallographers (including Sir Lawrence Bragg) when exhibited at a meeting of the X-ray Analysis Group of the Institute of Physics in Cambridge in the early 1940s. Although fully operative, it was never possible to make full use of it because of the unavailability of counters that would sum both positive and negative numbers. The prototype had merely one positive and one negative counter that could be connected to any of the output points. This, however, does not detract from the considerable achievements of designing and constructing the machine itself.

In 1941, Douglas was recruited by Dr Alex Muir, head of the Soil Survey Department at the Macaulay Institute for Soil Research, Aberdeen, to study, by X-ray diffraction, the mineralogy of clay fractions of the various soil types recognized in the field; the sand fractions were already being studied optically. The Institute had acquired a rather temperamental, simple, 'gas' X-ray tube (X-ray production being dependent on a small but critical leak of air) and Douglas' first task was to render this a reliable source of X-rays. This, through his natural ingenuity, he succeeded in doing and it served the Institute for many years as an excellent X-ray source. At that time, all X-ray diffraction powder patterns were recorded on film on a circular camera. To speed up the process and maximize output, he also designed and had constructed by the local scientific instrument makers (who once confided in me their frequent difficulty in meeting the precision requested), some vacuum cameras that also were in use at the Institute for many years. In view of the importance of measuring accurately high basal spacings, Douglas had these cameras machined so that they would accurately yield *d*-values very much higher than those obtainable on any powder camera then on the market. He also examined and devised various ways of obtaining oriented aggregates of clays in order to obtain the best preferred orientation. In these ways he utilized his intellectual, mechanical and manipulative skills to establish a reliable procedure for the X-ray determination of clay mineralogy.

During this time Douglas was also working on the systematic examination of clay samples provided by Soil Survey. Here he met challenges, particularly the

positive identification of minerals whose basal spacing depended on moisture content. He soon found, however, that if the moisture content were replaced by glycerol or glycol, a fixed spacing resulted that was independent of external moisture conditions, thus establishing the technique for positive identification of such minerals today. He also studied other possible discriminatory tests for various minerals. And this work indeed formed the basis of his later studies on clays.

At this time, those of us at the Macaulay Institute realized the advantage it would be if there were an organization where those involved in clay studies in Britain, and even abroad, could come together to discuss research and particularly the problems involved. This aspect has already been discussed by Douglas in his address to the 50th Anniversary Meeting of the Clay Minerals Group (*Clay Miner.* 1999, **34**, 3–5) but I feel he gave too much credit to me as he was the real moving spirit and his move to the Pedology Department at Rothamsted Experimental Station in 1946 gave him the advantage of being closer to London and the possibility of liaising with the Mineralogical Society.

[Editor's note: The above section was written by Robert C. Mackenzie who became ill and sadly died before he could complete this obituary.]

Douglas worked at Rothamsted for eight years in the Pedology Department headed by Alex Muir who had moved from the Macaulay. Also there were George Brown, Keith Norrish, Isaac Stephen and R. Greene-Kelly and this group established Rothamsted as one of the leading centres for clay mineralogy in the world. Douglas was particularly involved with clay mineral complexes with organic liquids and the study of interstratified minerals by Fourier transform methods.

In 1947, he became the founding Secretary of the Clay Minerals Group, a position he held until 1949 when he became the first Editor of the *Clay Minerals Bulletin* (to become *Clay Minerals* in 1965) for the following five years. Due mainly to his influence, the journal was from its instigation an international publication, being an outlet for clay research carried out by groups in different European countries. Much of the stimulation for the first edition (1951) of the Mineralogical Society Monograph entitled *X-ray Identification and Crystal Structures of Clay Minerals* originated from MacEwan who wrote chapters on *The Montmorillonite Minerals*, *X-ray Diffraction by Structures with Random Interstratification* (with George Brown) and *Non-Clay Minerals in Clays*. He contributed to chapters similar to the first two of these in the second edition (1961) and to a chapter on *Interlayer and Intercalation Complexes of Clay Minerals* co-authored by M.J. Wilson in a successor Monograph *Crystal Structures of Clay Minerals and their X-ray Identification* published

in 1980 and edited by George W. Brindley and George Brown.

Mainly as a result of his interest in languages (he was fluent in Spanish, French, German and Swedish), in 1954 he took up an appointment at the Agricultural Research Station in Granada, Spain to carry out research with Juan Martín Vivaldi. From then until 1967 he divided his time between Granada and Madrid (where he worked under Professor E. Gutiérrez Ríos in the Chemistry Department at the University) with five years as senior lecturer in the Physics Department of Queen's College, Dundee from 1957 to 1962. He had warm relationships with several Spanish scientists, especially with the postgraduates whose doctoral theses he directed in the 1950s and 1960s. Spanish scientists whose theses he supervised or with whom he worked very closely include A. Ruíz Amil, F. Aragón de la Cruz, J.A. Rausell Colón, J. Cano Ruíz, M. Rodríguez Gallego and A. Ramírez García. The high regard in which he was held in Spain was recognized when he was made an Honorary Member of the Sociedad Española de Arcillas in 1972.

In 1966, while in Madrid, MacEwan's overriding concern about the triple problems of population, resources and the environment led him to found The Conservation Society which did pioneering and important lobbying work for the next 20 years. About this time, he was beginning to feel very uneasy about the paths science was taking. Ever restless, he finally left Spain, and in effect gave up his scientific career in 1967 when he moved with his family to Co Waterford in the south of Ireland and started Volturna Press, a small-scale publishing business. In the 70s and 80s he wrote articles and gave talks on many topics including parapsychology, religion and the crisis of science, humanism, conservation, and minor languages. His links with scientist colleagues were very effectively demonstrated by his publication in 1986 of Robert H.S. Robertson's book *Fuller's Earth: a History of Calcium Montmorillonite*. With his family he moved to Peterhead in northeast Scotland in 1972 and then finally to Hythe in Kent in 1975. Always mindful of his Scottish roots, he founded the Clan Ewen Society in 1977 which now has a flourishing world-wide membership.

The importance and significance of Douglas MacEwan's contribution to clay science is clear from the fact that many of his papers published in the 1940s to the 1960s are still frequently cited in modern papers. He was a pioneer in clay mineralogy and truly left his mark on the subject.

Douglas MacEwan is survived by his wife Jean (née Hopley) whom he married in 1956, and their daughter Helen and son Neil.

R.C. MACKENZIE (deceased) and D.C. BAIN