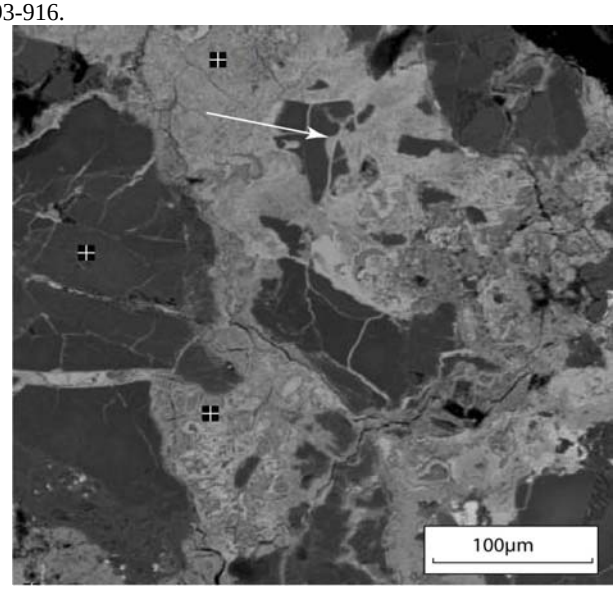
WEATHERING OF THE GLENROTHES METEORITE (H5), THE FIRST SCOTTISH FIND. A. Bell and M. R. Lee Department of Geographical and Earth Sciences, University of Glasgow, Lilybank Gardens, Glasgow, G12 8QQ, UK E-mail: martin.lee@ges.gla.ac.uk

Here we report results of a study of the weathering products of Glenrothes (H5), which was found in Fife (Scotland) in 1998. This is an unusual find since Scotland is not an ideal environment for meteorite accumulation; it has high levels of precipitation, and hence weathering, and plentiful vegetation cover, which can obscure potential meteorite finds.

The weathering products in Glenrothes were characterised by backscattered electron imaging and X-ray microanalysis, the latter focusing on Fe, Ni, S and Si. Two hot desert finds of comparable weathering grade, Acfer 019 (L6) and Acfer 275 (H5-6), were examined in parallel in order to compare weathering products between the two very different climatic regions. This information was supplemented by consulting previous work on hot and cold desert meteorites [1]. The composition and features of the outermost surface of Glenrothes were also analysed, and these were compared with a soil sample taken from the reported site of discovery.

Results and discussion: We have found considerable similarities between the styles of weathering in Scotland and the Sahara, both in terms of the compositions of weathering products and related veining and brecciation of the stones. This suggests that despite the climatic differences, the underlying processes of meteorite weathering, including oxidation and hydration of Fe,Ni metal and troilite, are comparable regardless of climate. Ideally, Glenrothes would only be compared to meteorites of the same petrologic type and differences between the L and H group meteorites may explain some of the minor compositional and petrographic contrasts found.

References: [1] Lee, M. R., Bland, P. A. 2004. Mechanisms of weathering of meteorites recovered from hot and cold deserts and the formation of phyllosilicates: Geochimica et Cosmochimica Acta 68, 893-916.



Backscattered electron image of Glenrothes, with arrow pointing to brecciation.