



Fig. 2. Superimposed Laue patterns of a large aluminium crystal (sharp spots) and of an unconsumed inclusion of the original deformed matrix (slightly elongated spots). Pairs of spots enclosed by \square would coincide if the orientation relationship between crystal and inclusion was exactly that of a spinel twin

twin orientations sufficiently to understand why consumption of an approximate twin lattice is apparently so difficult.

Note added in proof. In recent work by P. A. Beck, M. L. Holzworth and Ph. Sperry on grain growth in Al-Mn alloys (1948) it was similarly found that the large crystals, which develop on continued heating of special fine-grained recrystallized material by a process of 'exaggerated' or 'discontinuous' grain-growth (also called 'secondary recrystallization'), leave unconsumed definite small grains of the original matrix: Prof. Beck kindly put some of his crystals at our disposal, and here also the same 'approximate twin-relation' between large crystal and imbedded inclusion was found.

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Electrokinetic Potentials of Aged Barium Sulphate Crystals

ELECTROKINETIC methods can be used with great advantage in the study of the adsorption of electrolytes or potential-determining ions on crystalline substances. One of us¹ determined the streaming potentials in diaphragms of precipitated and aged barium sulphate, as a function of the composition of the bathing electrolyte solution. Reyerson, Kolthoff and Kieth Coad² have recently confirmed in a general way these results, with the exception that they found a constant negative charge in hydro-alcoholic (50 per

cent) solution of potassium chloride ($10^{-5} M$). Ruyssen¹ had found that by the replacement of the aqueous potassium chloride solution by a hydro-alcoholic one the initial negative charge was reversed.

We have re-investigated the point under discussion with the same samples of barium sulphate and the following experimental facts were definitely established: (1) The charge of the barium sulphate was negative in both aqueous and hydro-alcoholic potassium chloride ($10^{-5} M$) solution, provided these were the first solutions with which the crystals came in contact. (2) When the aqueous potassium chloride solution was displaced by a hydro-alcoholic one, the measured charge became positive. When the crystalline substance was taken out of the diaphragm and thoroughly washed and shaken with the same liquid, its charge was again reversed to negative. (3) When the hydro-alcoholic solution of the first experiment was displaced by pure water, the crystals were charged positively. (4) In a saturated barium sulphate solution, without other electrolytes, the crystals became again negatively charged.

We may conclude that the normal equilibrium charge of pure barium sulphate is negative in aqueous potassium chloride solution and saturated barium sulphate solution as well as in hydro-alcoholic potassium chloride solution. This is in agreement with Reyerson *et al.*², but not with the positive streaming potentials found by Buchanan and Heymann³ of natural barytes and recrystallized barium sulphate. On the other hand, we confirmed the experimental fact of the reversal of the charge of the barium sulphate when the aqueous solution is displaced by a hydro-alcoholic one, although this seems not to be the equilibrium charge. It seems that in the hydro-alcoholic medium there is a precipitation of the barium sulphate out of the displaced saturated aqueous solution, followed by preferential adsorption of the Ba^{++} ions.

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Factors Controlling the Atlantic Coastline of Europe

IN 1938, W. V. Lewis¹ pointed out that the general line of a shore tends to be at right angles to the direction of dominant wave-attack, and that as a bay becomes adjusted to this attack it tends to become asymmetrical, with the longer, smoother side facing the quarter from which the dominant waves approach. In 1940², I suggested that the theory applied by Mr. Lewis to beach material and easily eroded cliffs might be developed to explain the outline of the larger bays of south-west England. I showed that this would account for the fact that their eastern sides have been rendered comparatively smooth, with blunted headlands, while their western sides have been protected from dominant wave-attack, so that their indented minor bays have been preserved between angular promontories.

Various geologists have since suggested to me that this view of coastal development may be applicable