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Author(s)	WAKAHAMA, Gorow
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Plastic Deformation and Internal Fractures of Ice Crystal*

— A Motion Picture —

Gorow WAKAHAMA

若 浜 五 郎

*The Institute of Low Temperature Science
Hokkaido University, Sapporo, Japan*

Abstract

Thin rectangular plates of ice crystal, 1 mm thick and 2×2 cm in area, were observed through polarized light as they were laterally compressed or extended at constant slow speeds. The experiments were done at -5°C . Time-lapse 16 mm motion pictures were taken of the processes of deformation occurring in each of the ice grains composing the plates. As will be seen in the motion pictures, the predominant features of deformations were glides along basal planes accompanied by rotation of the *c*-axis of the ice grains, formation of bend planes or small-angle boundaries, breakdown of the texture and recrystallization. Other deformations such as caused by slips at grain boundary and migration of grain boundary were also noticed.

As the compression or extension proceeded internal fractures came into view. They can be divided into three kinds: (1) intra-granular fractures, including formation of a triangular nucleus of fracture and its development, cleavage fracture along basal planes, (2) grain boundary fracture, (3) inter-crystalline fracture.

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References

- 1) WAKAHAMA, G. 1962 On the plastic deformation of ice I-IV. *Low Temp. Sci.*†, **A 20**, 57-130.
- 2) WAKAHAMA, G. 1964 On the plastic deformation of ice V. *Low Temp. Sci.*†, **A 22**, 1-24.
- 3) WAKAHAMA, G. 1965 Internal fracture of ice. *Low Temp. Sci.*†, **A 23**, 39-50.

† In Japanese with English summary.

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