## REFERENCES

- 1. Megaw, H. D. Cell dimensions of ordinary and "heavy" ice. Nature, Vol. 134, No. 3397, 1934, p. 900-01.
- 2. Owston, P. G. Diffuse scattering of X-rays by ice. Acta Crystallographica, Vol. 2, No. 3, 1949, p. 222-28.
- 3. Mason, B. J., and Owston, P. G. Ice crystals of spiral form grown from the vapour. Philosophical Magazine, Ser. 7, Vol. 43, No. 343, 1952, p. 911-12.
- 4. McConnel, J. C. On the plasticity of an ice crystal. Proceedings of the Royal Society of London, Vol. 49, No. 299, 1891, p. 323-43.
- Mügge, Ö. Ueber die Plasticität der Eiskrystalle. Neues Jahrbuch für Mineralogie, Geologie und Palaeontologie, 1895, II Bd., p. 211-28.
- Tammann, G., and Salge, N. Der Einfluss des Druckes auf die Reibung beim Gleiten längs der Gleitebenen von Kristallen. Neues Jahrbuch für Mineralogie, Geologie und Paläontologie, Beilage Bd. 57, Abt. A Mineralogie und Petrologie, 1928, p. 117-30.
- Nacken, R. Über das Wachsen von Kristallpolyedern in ihrem Schmelzfluss. Neues Jahrbuch für Mineralogie, Geologie und Paläontologie, 1915, II Bd., p. 133-64.
- 8. Adams, J. M., and Lewis, W. The production of large single crystals of ice. Review of Scientific Instruments, Vol. 5, No. 11, 1934, p. 400-02.
- 9. Jona, F., and Scherrer, P. Determinazione delle costanti elastiche del ghiaccio. Nuovo Cimento, Ser. 9, Vol. 8, No. 12, 1951, p. 981-93.
- 10. Die elastische Konstanten von Eis-Einkristallen. Helvetica Physica Acta, Vol. 25, Fasc. 1/2, 1952, p. 35-54.
- Lavrov, V. V. Vyazkost' l'da v zavisimosti ot temperatury. [The viscosity of ice and its dependence on temperature.]
   Zhurnal Tekhnicheskoy Fiziki [Journal of Technical Physics], Tom 17, Vyp. 9, 1947, p. 1027-34.
- 12. Glen, J. W. Experiments on the deformation of ice. Journal of Glaciology, Vol. 2, No. 12, 1952, p. 111-14.
- 13. Rate of flow of polycrystalline ice. Nature, Vol. 172, No. 4381, 1953, p. 721-22.
- Perutz, M. F. Polarizing attachment for the microscope of a single crystal X-ray goniometer. Journal of Scientific Instruments and Physics in Industry, Vol. 26, No. 4, 1949, p. 127–28.
- 15. Andrade, E. N. da C., and Roscoe, R. Glide in metal single crystals. Proceedings of the Physical Society, Vol. 49, No. 271, 1937, p. 152-76.
- 16. Bjerrum, N. Structure and properties of ice. Science, Vol. 115, No. 2989, 1952, p. 385-90.
- 17. Steinemann, S. Results of preliminary experiments on the plasticity of ice crystals. Journal of Glaciology, Vol. 2, No. 16, 1954, p. 404-12.
- 18. Cahn, R. W. Slip and polygonization in aluminium. Journal of the Institute of Metals, Vol. 79, Pt. 3, 1951, p. 129-58.
- 19. Greenough, G. B., Bateman, C. M., and Smith, E. M. X-ray diffraction studies in relation to creep. Journal of the Institute of Metals, Vol. 80, Pt. 10, 1952, p. 545-50.
- 20. Suiter, J. W., and Wood, W. A. Deformation of magnesium at various rates and temperatures. Journal of the Institute of Metals, Vol. 81, Pt. 4, 1952, p. 181-88.

## PAUL NIGGLI (1888-1953)

In the death of Professor Niggli on 13 January 1953 the scientific world lost an outstanding teacher and scientist, and glaciological study a stalwart supporter.

Director of the Mineralogical-Petrographical Department of the Eidgenössische Technische Hochschule at Zürich, his text-books on mineralogy and petrography and his numerous papers on a wide range of subjects, including education, politics and the history of science, will be an everlasting memorial to his personality and activity.

It is not so well known that for twenty years Niggli was in close contact with snow and ice research. He wrote the introduction to the first fundamental publication of the Eidgenössisches Institut für Schnee- und Lawinenforschung, Weissfluhjoch, entitled *Der Schnee und seine Metamorphose*, 1939, outlining the background and the aims of Swiss snow research. For the inauguration of the new Institute in 1943 he gave a most impressive address on the beginning and development of snow and glacier research in the Swiss Alps (*Schnee- und Gletscherforschung in der Schweiz*, Mitteilung, Nr. 1). With his profound analysis of scientific discovery in the Swiss Alps he freed the new Institute from a merely technical programme and linked it to the uninterrupted tradition of Alpine science.

In the literature of snow Niggli's name appears but rarely. Nevertheless, a good deal of the work done by the research workers at the Weissfluhjoch profited by his valuable support.

As a member of the Schweizerische Schnee- und Lawinenforschungs Kommission he always emphasized the need for crystallographical investigations, but, never blind to practical requirements, he was always ready with advice upon any "applied problem" including organization, personnel and finance.

Niggli's intellect was universal, and he was engaged in innumerable tasks and duties. We may wonder, therefore, why the comparatively narrow branch of snow and ice research was honoured in receiving so great a share of his devotion and energy. Niggli's deep affection for the glacier
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