ligible the more, if the subjective character of the measurement is taken into consideration.

The influence of the distance $a$ (from the light source and the block examined) is very important. It has been stated, that the stria located at the limit of visibility by a certain diaphragm diameter $\Phi$ becomes better visible when increasing the distance $a$ from the light source to the block. However, if the diaphragm diameter $\Phi$ would be changed proportionally to the distance $a$, then the striae appears again on the screen. Hence, it can be concluded that the visibility of the stria on the screen depends first of all on the ratio $\Phi/a$. The results of the measurements performed are presented on the graphs (Figs 3, 4).

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# Investigation of Birefringence in the NaCl Monocrystals

## 1. Introduction

Investigation of the birefringence in plastically deformed NaCl monocrystals is, as a matter of fact, an examination of stress resulting from existing dislocations. The stress decay with the temperature may supply some information about the processes leading to diminishing the number of dislocations.

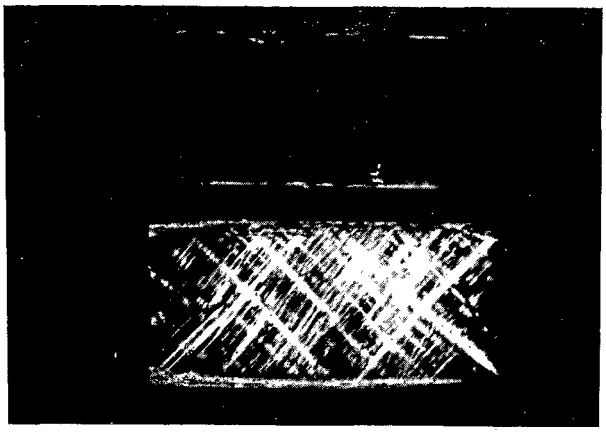

Fig. 1

Investigations of processes of hardening and tempering were carried out by many authors [1—4], and a common feature of these examinations was that the measured parameter was always the flow stress. On the other hand, each measurement of the flow stress is a damaging trial and consequently the obtained graphs of the flow stress given in the works cited above are an interpolation of the results obtained from a number of samples rather than one sample.

The purpose of the present paper was to examine the process of the stress decay in a crystal in the course of heating when taking account of the relation between the internal stress existance and the consolidation of the crystal.

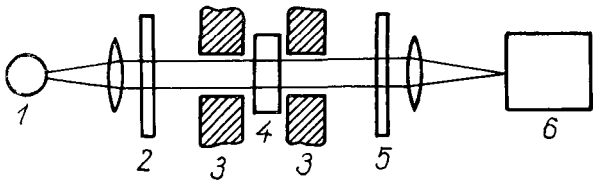


Fig. 2

## 2. The Experimental Part

After having been splintered into required samples the NaCl crystals were soaked at the temperature 600 °C and next cooled slowly in order to remove the internal stress. The samples prepared in this way did not exhibit any birefringence, the fact confirming the absence of internal stress. After ha-

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ving been soaked the samples were plastically deformed by means of an unaxial squeeze, the deformation ranging between 2.5 and 6.5 per cent. The samples deformed appeared to possess some slide band observed only in the direction parallel to one of the two symmetric axes of the sample, both being perpendicular to the deformation direction (Fig. 1). This direction will be denoted hereafter by a letter P.

The deformed samples were located in a system presented in Fig. 2. They were oriented in such a way that the light beam was parallel to the direction P (along which the slide bands were observed). The direction P having the property of maximal light transmittance through the system composed of a sample and crossed polaroids. When inserting the samples into an arrangement shown in Fig. 2 photocurrent appeared in the photo multiplier unit.

As can be seen in Fig. 3 (see [1]) the photocurrents measured in the two remaining directions (with the exception of the P direction) are negligible and were not taken into account during the temperature measurements. The dependence of the photocurrent upon the temperature was evaluated with the help of the device shown in Fig. 2. There, the temperature of a sample placed in a special furnace supplied with a number of small holes to allow the light bundel passing through, was being changed slowly starting from 20 °C up to 500 °C. The temperature nonuniformity in the neighbourhood of the sample due to the holes was disregarded.

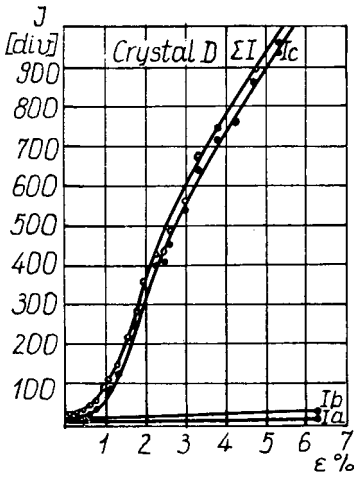


Fig. 3

## 3. Discussion of the Results and Conclusions

The plots of the photocurrent as a function of the temperature presented in Fig. 4 show a typical run, the same for many samples. These curves are completely similar to those given by Kear and Partt in [4] and reproduced here in Fig. 5. Here, a relation of the flow stress in the crystal to the tempering temperature has been presented, the stress being measured without cooling just at the heating temperature.

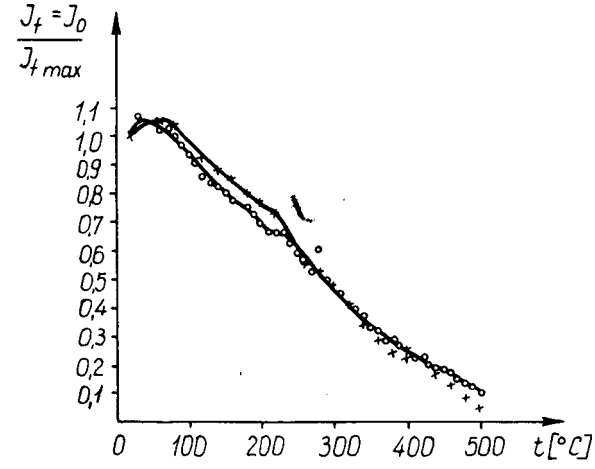


Fig. 4

The said similarity of the curves implies a similarity in the processes taking place in both the cases, i. e. the same mechanisms seem to be responsible for rebuilding of the crystal lattice due to both the internal and external stresses.

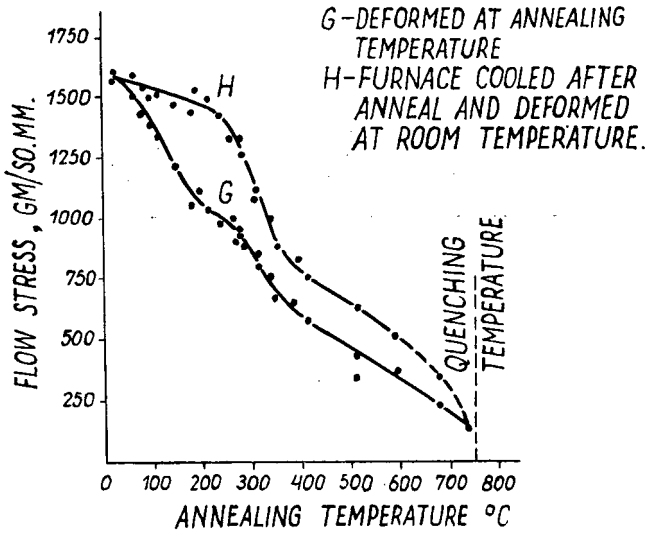


Fig. 5

The above measurements exhibit some convergence of the results, concerning mechanical properties of the crystal, obtained with the help of the mechanical method and the optical one. Some superiority of the optical method consists in offering a possibility of constructing a plot for a single sample only. The obtained results confirm the hypotheses about the existence of different mechanisms leading to the decay of internal stress in the sample (see [4] and [7]).

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*Zygmunt Bilewicz* *


# A Proposal for New Criteria of Striae Classification in Optical Glass for the Shadow Method

The contents of this report are results concerning the determination of vital conditions which may influence the visibility of striae in the shadow projection method of striae estimation.

The outcome of this work is a proposition for Polish Standards of glass classification in respect to its striae content.

The research was based on a reconstruction of setups from Soviet, Czechoslovakian and Polish Standards.

Apart from that, I carried out tests on my own setup, which after some modifications proposed by doc. Florian Ratajczyk became a proposal for Polish measurement setup.

Generally speaking, every setup for the study of glass striae content by the shadow projection method makes use of the fact that the striae disappear in certain conditions and is based on: 1) a light source, 2) the studied glass, and 3) a screen, realized differently in different standards and placed at different distances *a*, *b*, *c* between them.

So it may be assumed a priori that the visibility of striae is determined by the receptor, physical and geometrical properties of the light source, the distances *a*, *b*, *c* between the elements I, II and III, and by the glass grade and its position.


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Despite the advantages of the photoelectric methods of image recording I decided to use the photographic recording because of its simplicity and character similar to that of visual observation.

Fixing all but one of the studied parameters I obtained the following results:

1. The intensity of illumination is determined only by the recorder operation threshold and does not influence the striae character. In subjective observations the intensity should be within the limits of 50 — 150 Lx.
2. The effect of the light being monochromatic is observed only in those striae images whose character is distinctly diffractive. Since the optics made of tested glass operates, in principle, throughout the whole visible spectrum, further study was carried on using the "white" light.
3. The dimensions of the light source proved to be one of the vital factors determining the striae image. With the distances *a* and *b* fixed at 500 and 250 mm,

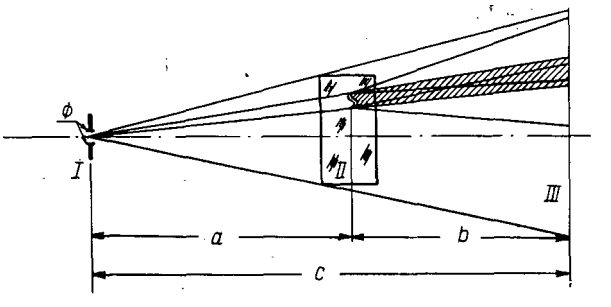


Fig. 1