Additional Pictures to: Process Induced Defects in Si Chips

Part 1 Pictures in the Report and Publication

Links to

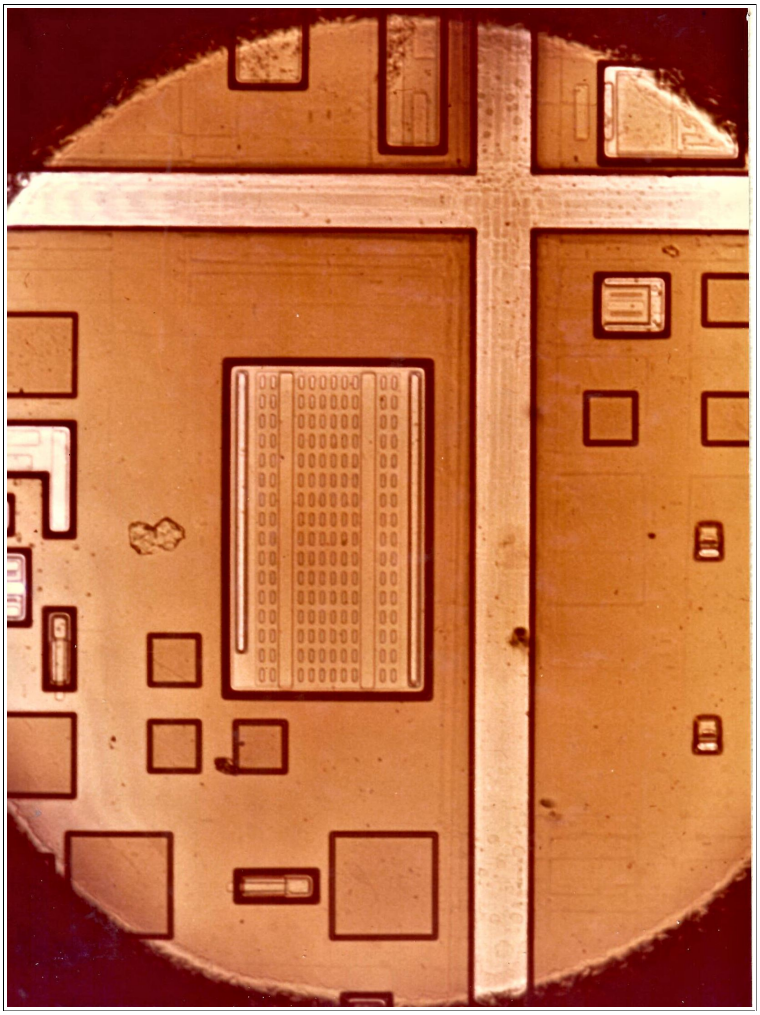
- **Auxiliary Pictures Part 2**
- **Auxiliary Pictures Part 3**

In what follows you find

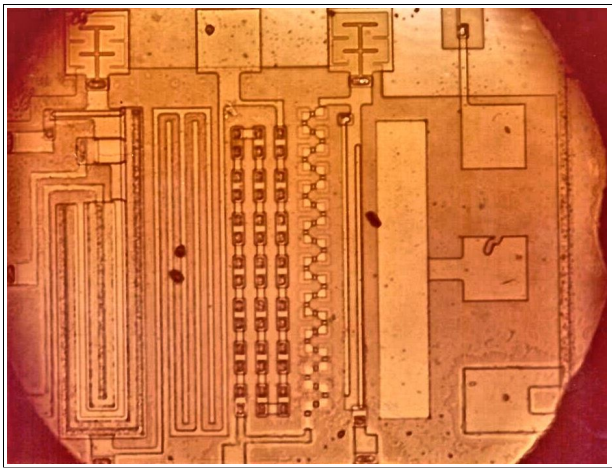
1. High quality pictures of the ones shown in the Report or the publication.
2. Additional pictures complementing those from above
3. Some pictures not relating directly to 1.

I will not provide much text for pictures that are contained in the report and/or publication. Look it up there.

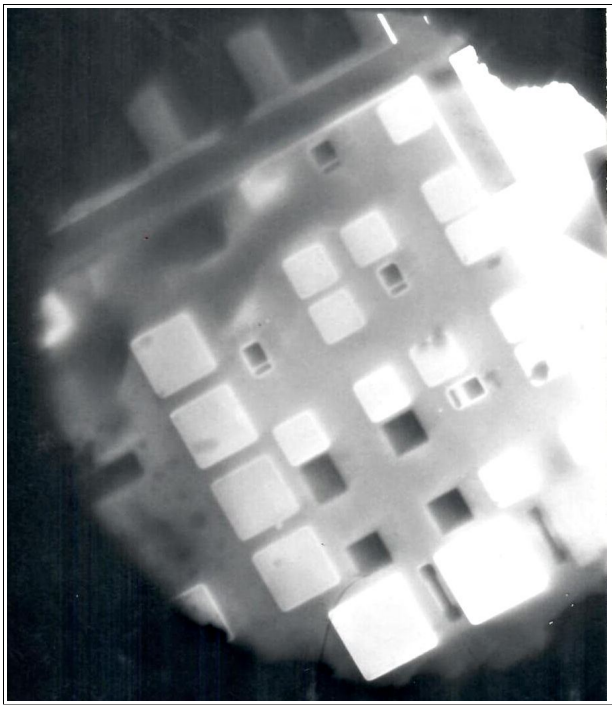
I start with some pictures showing the key to these investigations: specimens being transparent to a HVTEM electron beam in huge areas – all the areas inside the specimen holder, in fact.



Looking through the mounted specimen in an optical microscope.
The diameter is 2.3 mm. We see structurs belonging to an integrated circuit ***(IC***)



Same as above but different IC.



HVTEM picture of the whole specimen at a magnifications of 63 x!.
A very unusual picture at a normally impossibly small magnification.

- Next I show some of the HVTEM pictures used in the report. This does not include all the TEM pictures because I didn't take all of them.
  Some of these pictures were also used in the publications as given in the caption.
  - I'm not offering explanations here. Refer to the report (or the publications where appropriate) to learn about the meaning of these pictures
- Now I need to to make a point. All these pictures may appear rather common today (Oct. 2022). However, when we took them in 1975/76, they were spectacular.
  Many of the defect structures found have never seen before. In some cases we simply did not know what we witnessed. It took involved contrast analysis and some cunning to figure out what has happened. It is hard today to imagine the excitement one experienced seeing some of these things for the first time.

Fig. 13 in report.

Fig. 14a) in report..

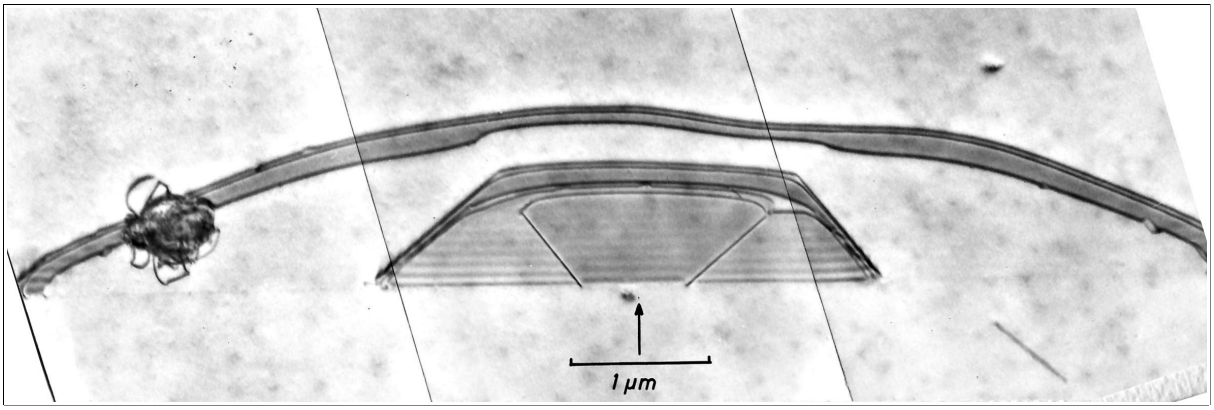
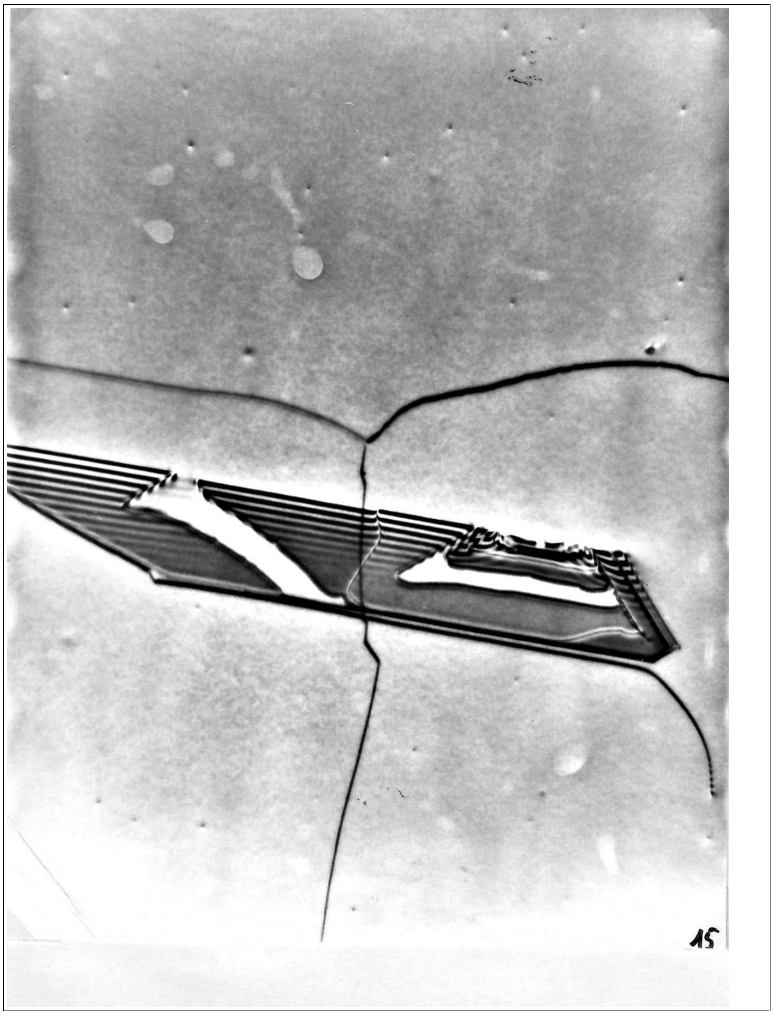
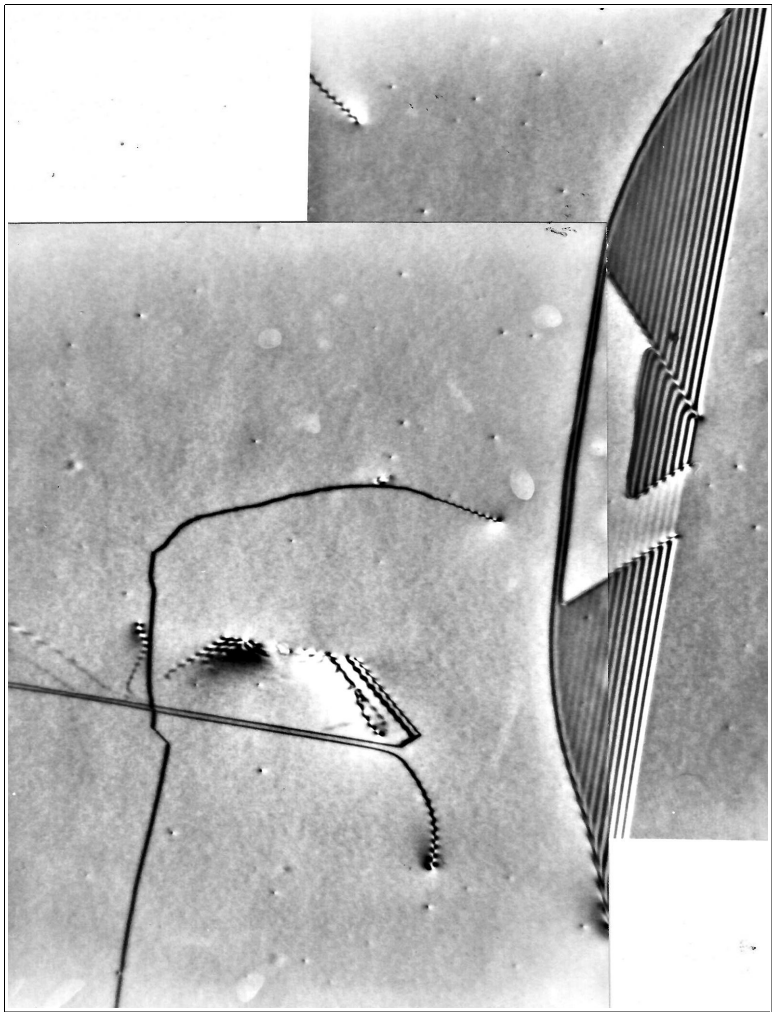
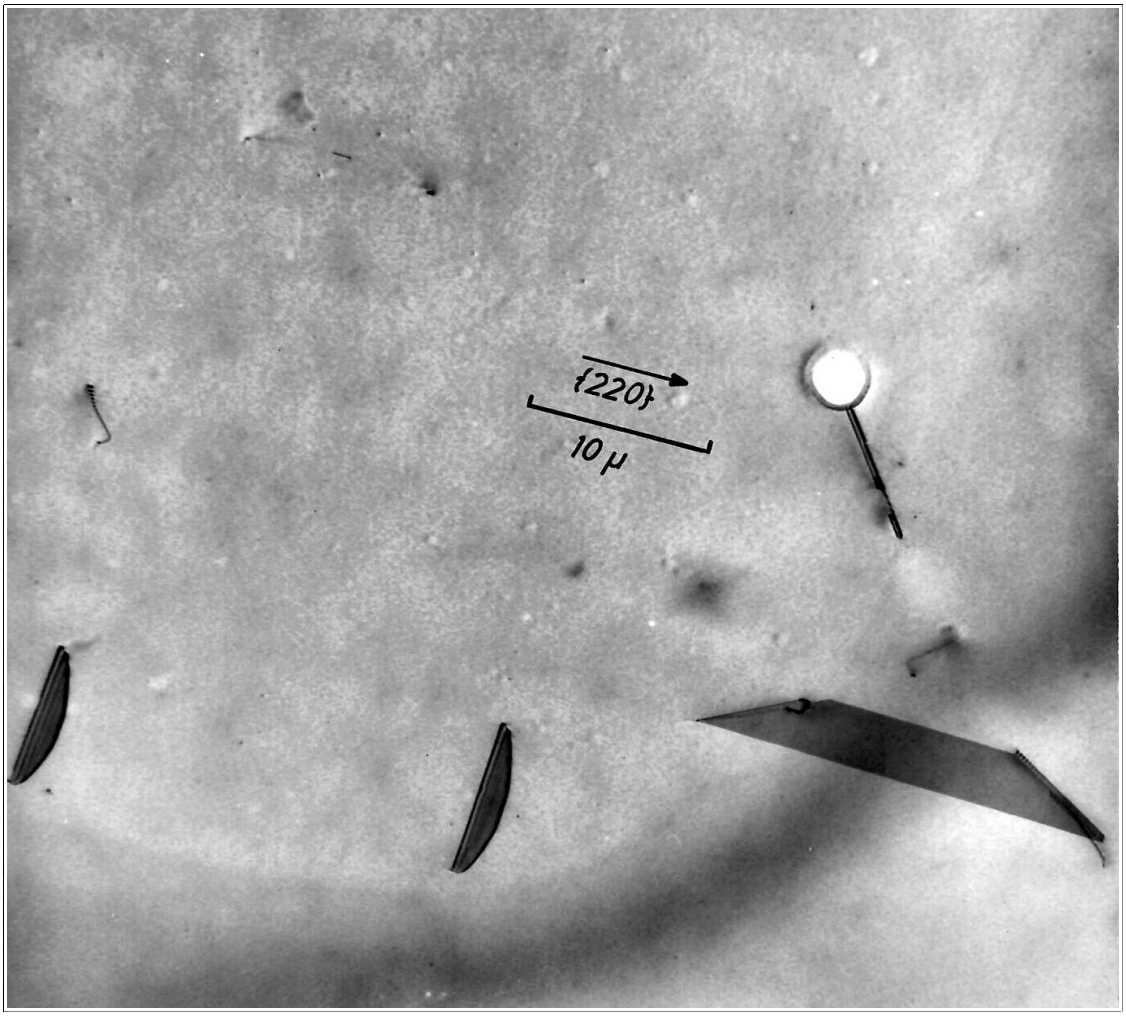


Fig. 14 b in report; Fig. 3b in publication..
Fig.3 (a) Stacking fault network, (b) nine-fold stacking fault.





Auxiliary picture.
Multiple stacking fault from above out of contrast
plus another one (in contrast) at the side.



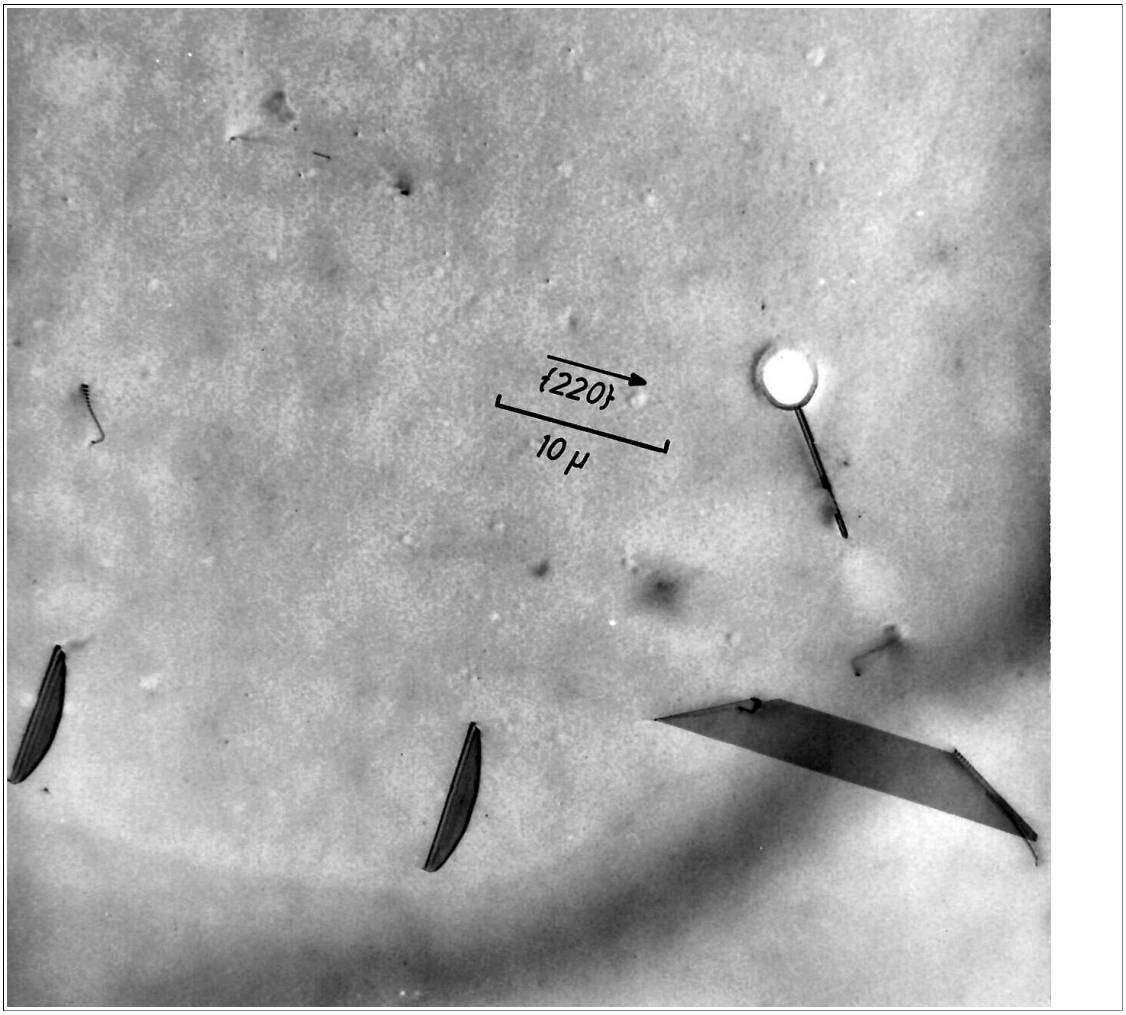
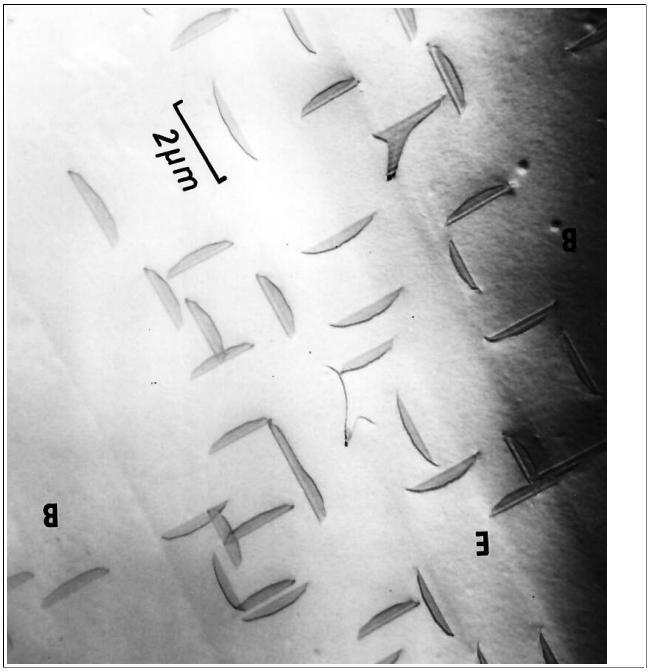


Fig. 15 a) and b) in report. .



Detail to Fig. 18 in report.

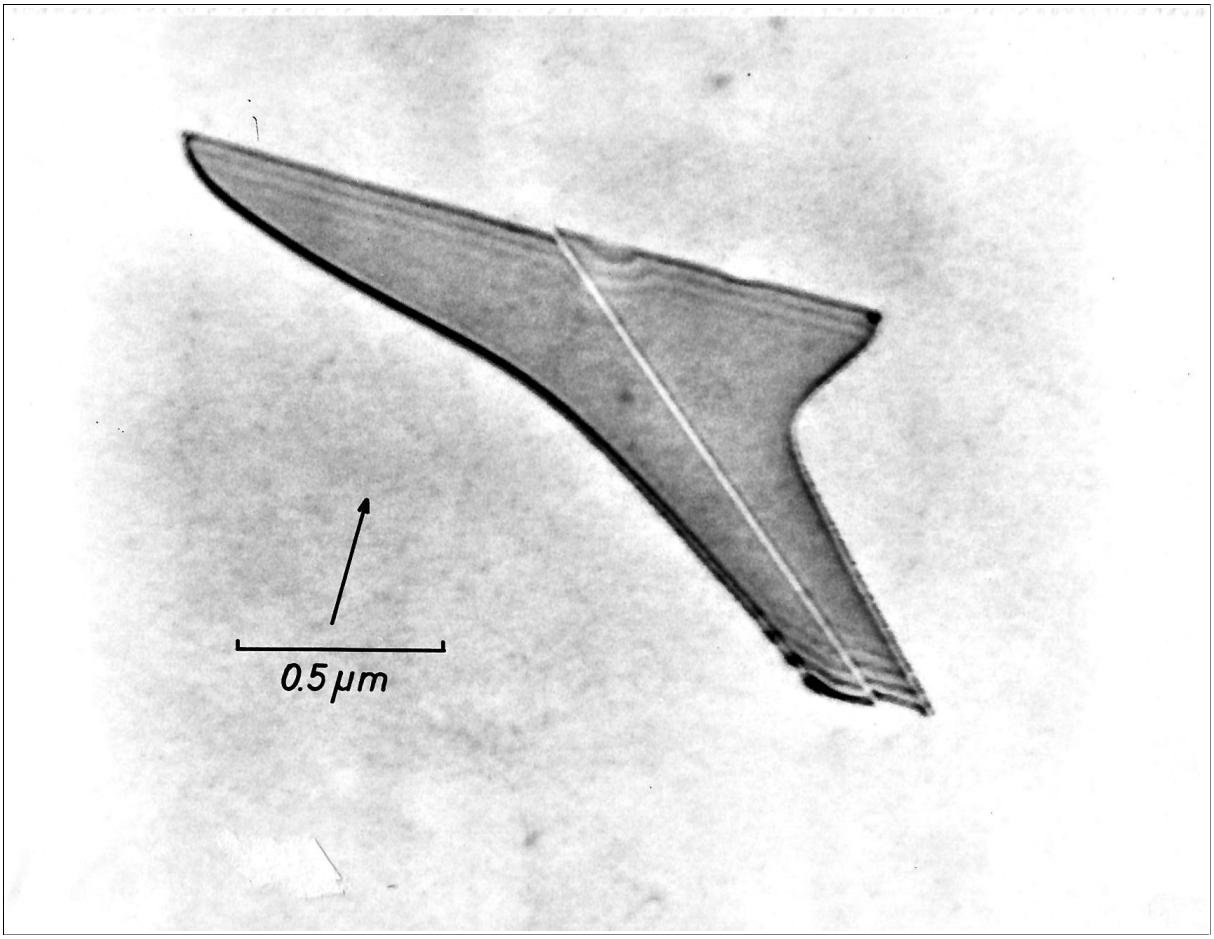
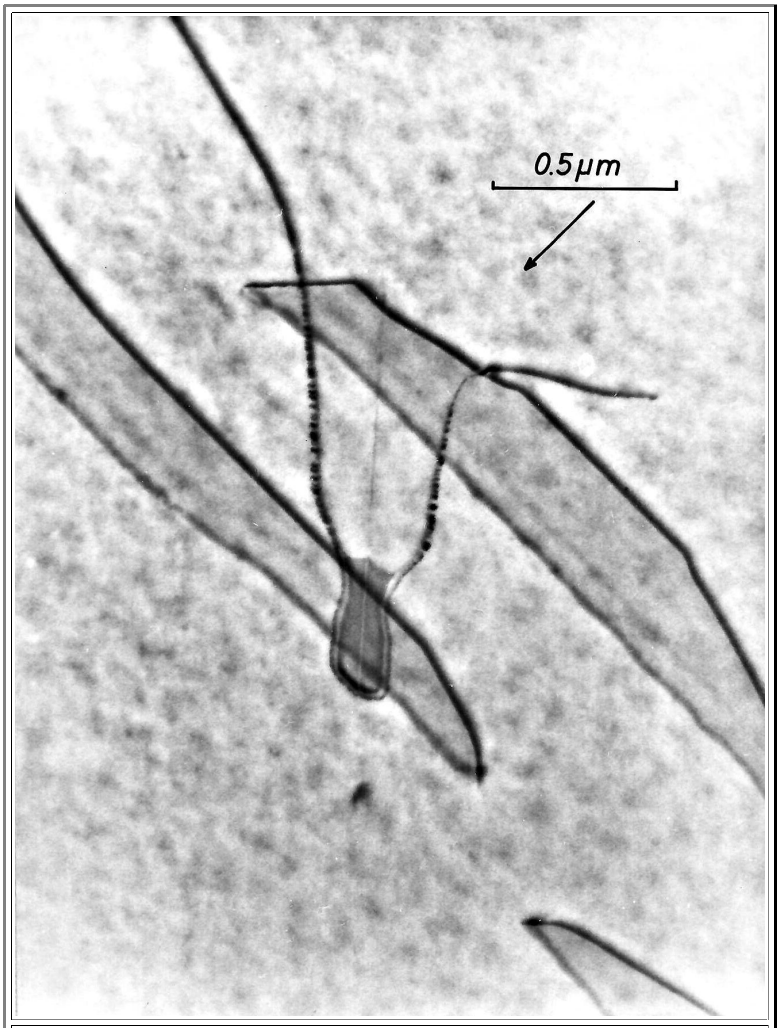


Fig. 19a) in report; Fig. 6 in publication.
Fig.6 Typical example of an unfaulted sailing boat SF.



. **Fig. 19b) in report; Fig. 7a) in publication**
Fig.7 (a) Sailing boat stacking fault after an unfaulting rcaction.
(b) Schematical drawing of its crystallographic structure. (below)

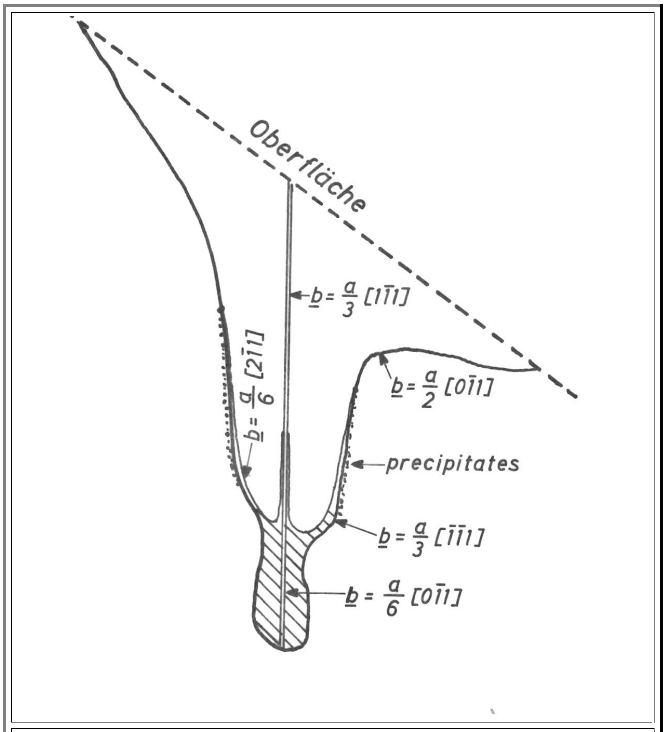
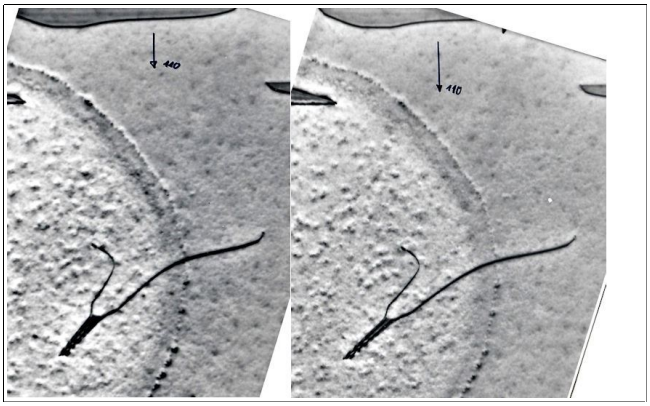


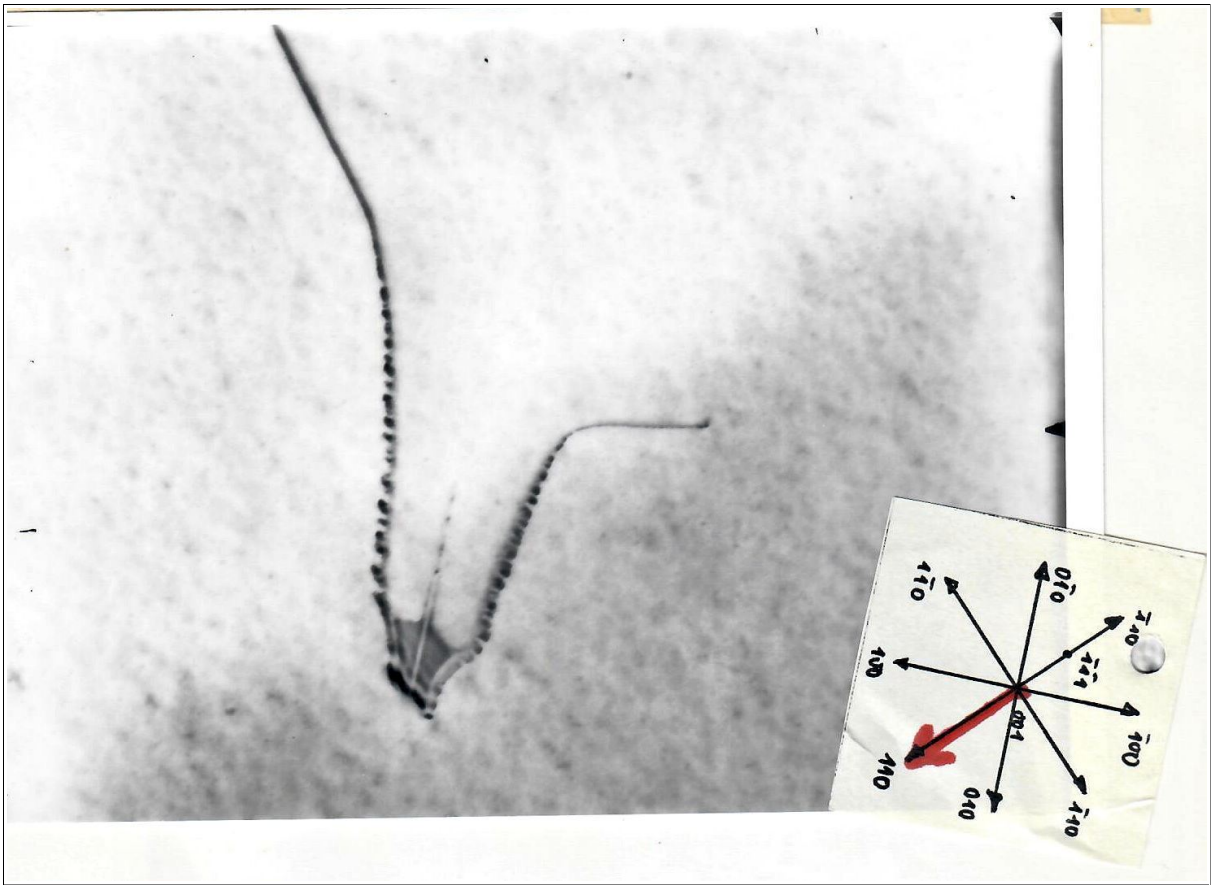
Fig. 19c) in report; Fig. 7b) in publication.
This fellow combines all possible kinds of dislocations in Si plus a stacking fault.
The unfaulting reactions is rarely seen "in-situ".

What follows are a few auxiliary pictures showing this remarcable stacking fault complex

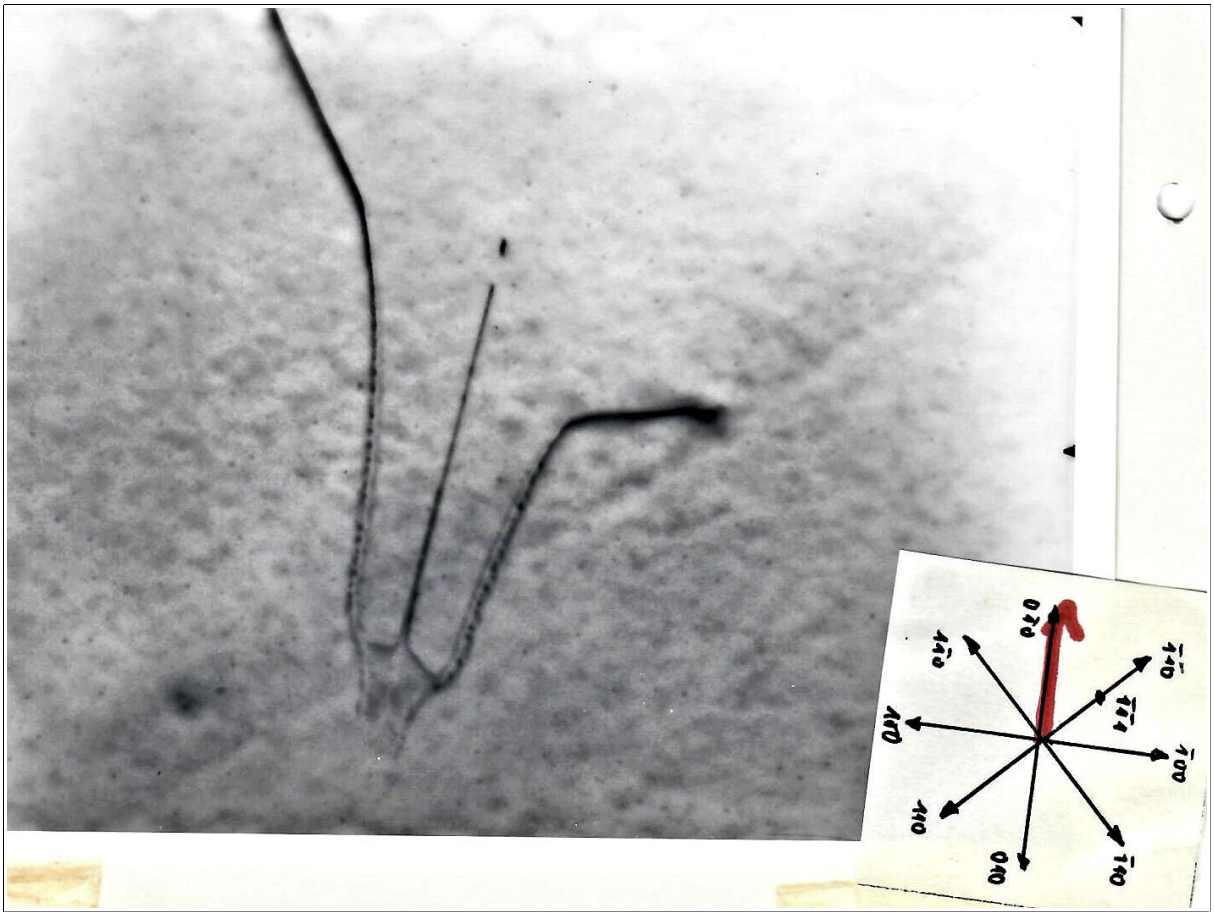


Relating to Fig. 19c) in report; Fig. 7b) in publication.

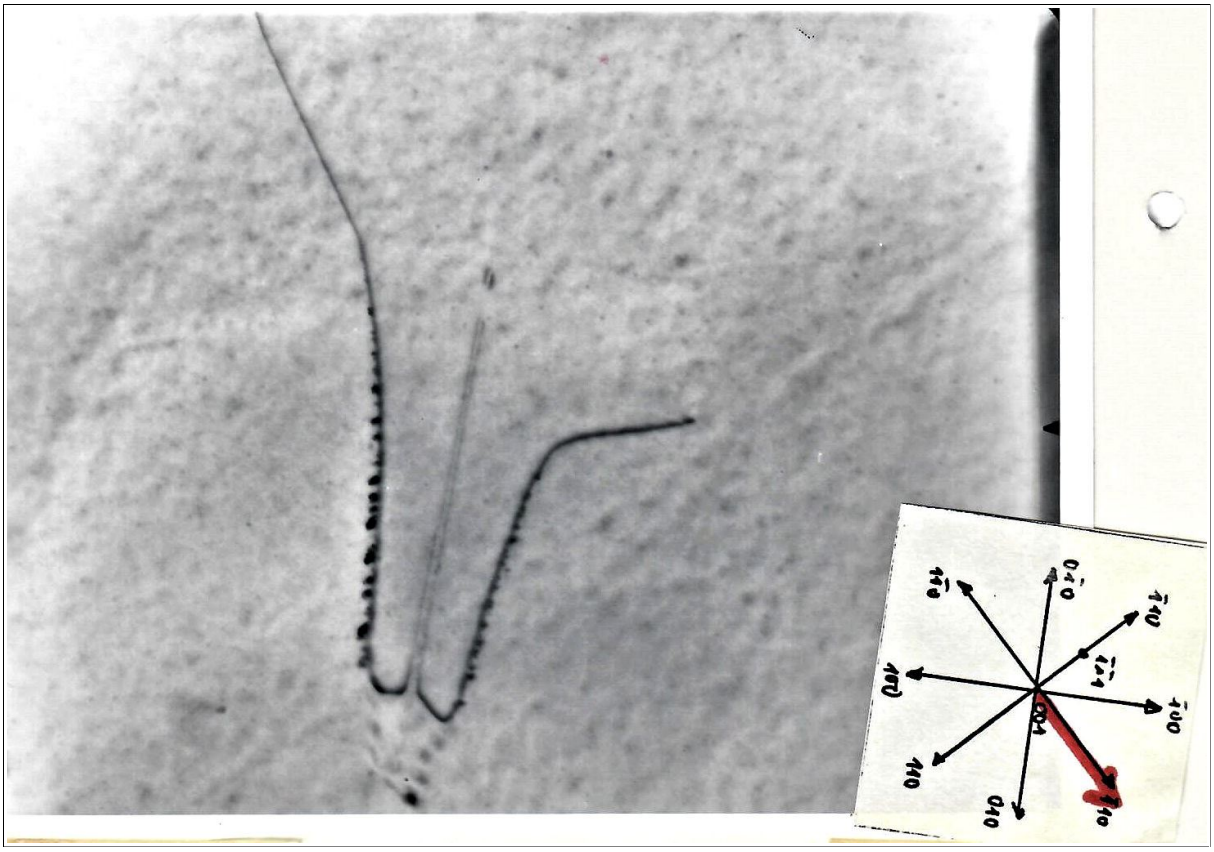
One of the many stereo sets taken



Relatuing to Fig. 19c) in report; Fig. 7b) in publication.
This and the following pictures allow contrast analysis.



Relatuing to Fig. 19c) in report; Fig. 7b) in publication.
This picture allow contrast analysis.



Relatuing to Fig. 19c) in report; Fig. 7b) in publication.
This picture allow contrast analysis.

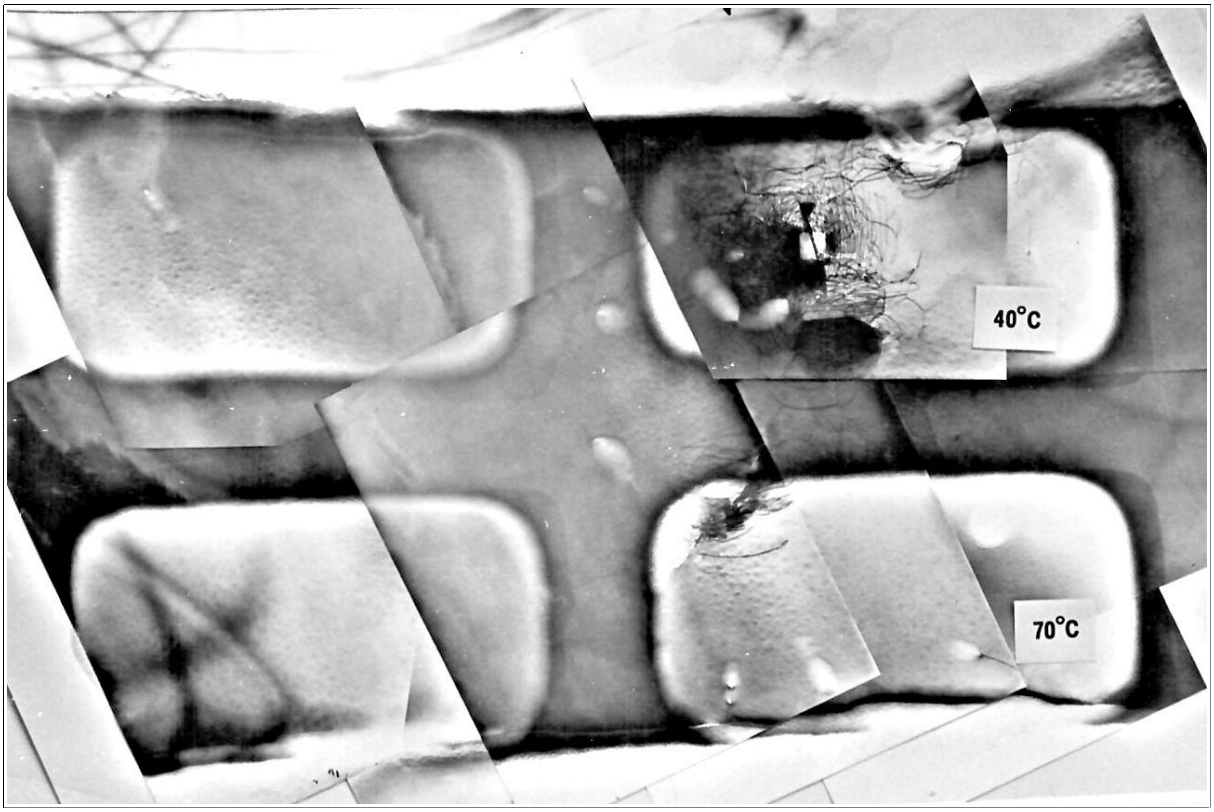
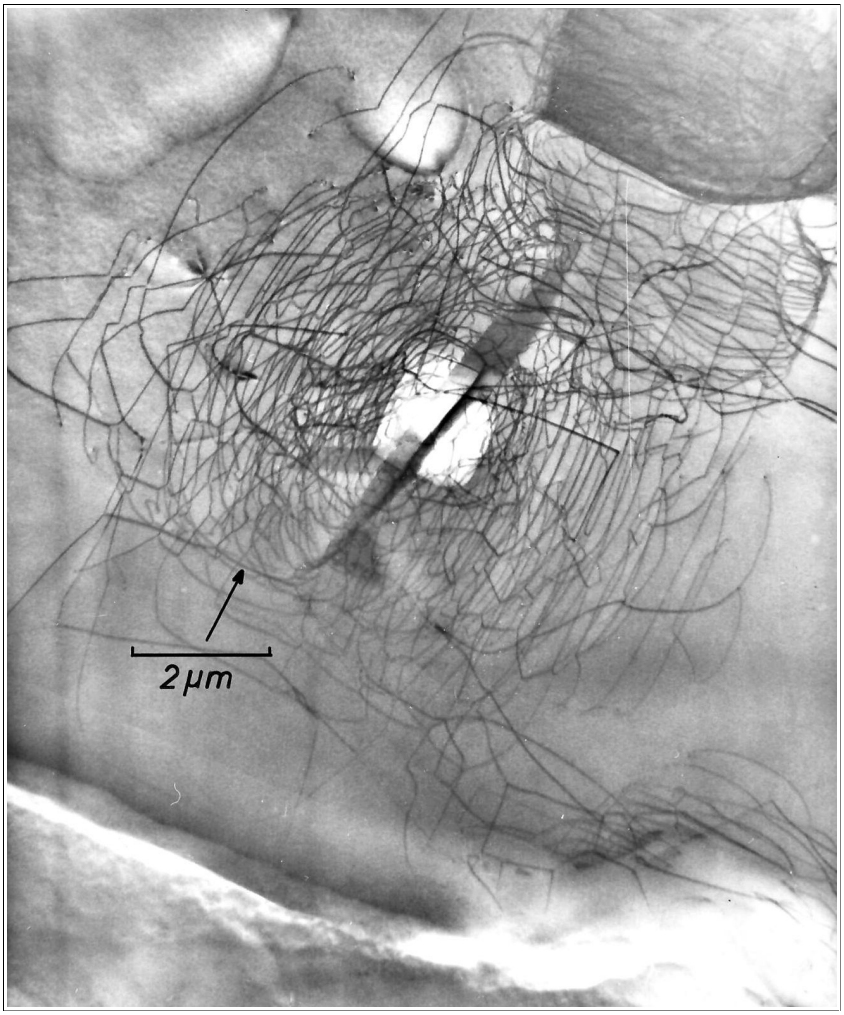


Fig. 50 in report.



Enlarged part of Fig. 50 in report; Fig. 2b in publication.

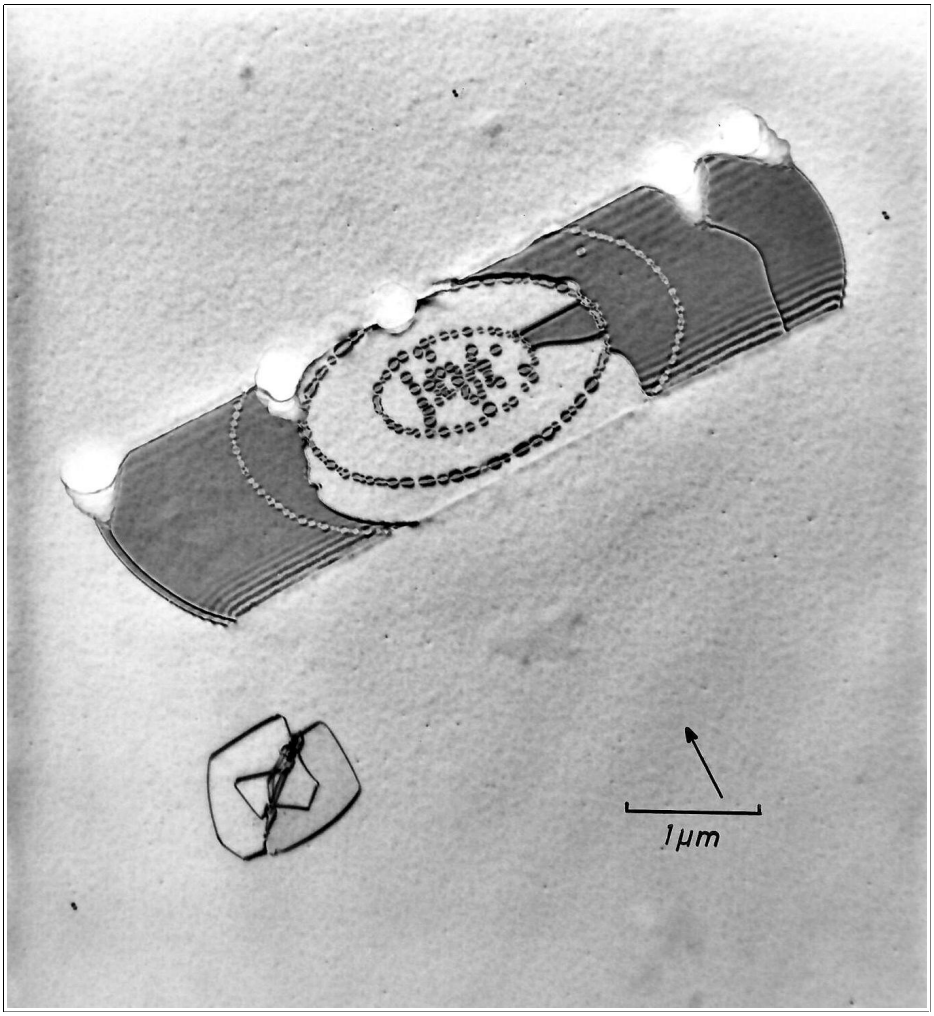


Fig. 55 in report, Fig. 10a) in publication.

Here are a few pictures only used in the publication:

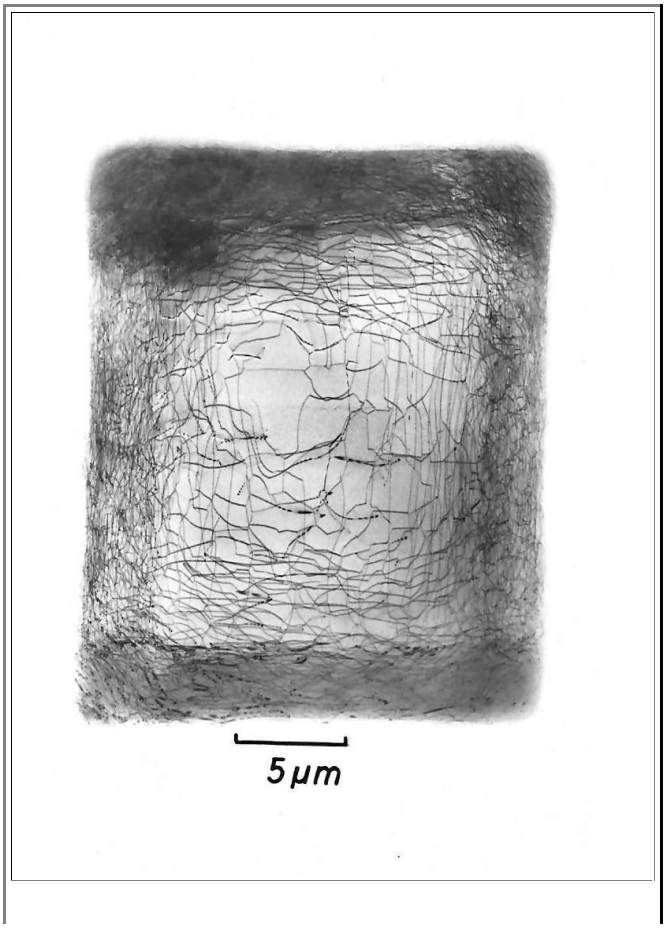


Fig. 1a in publication.

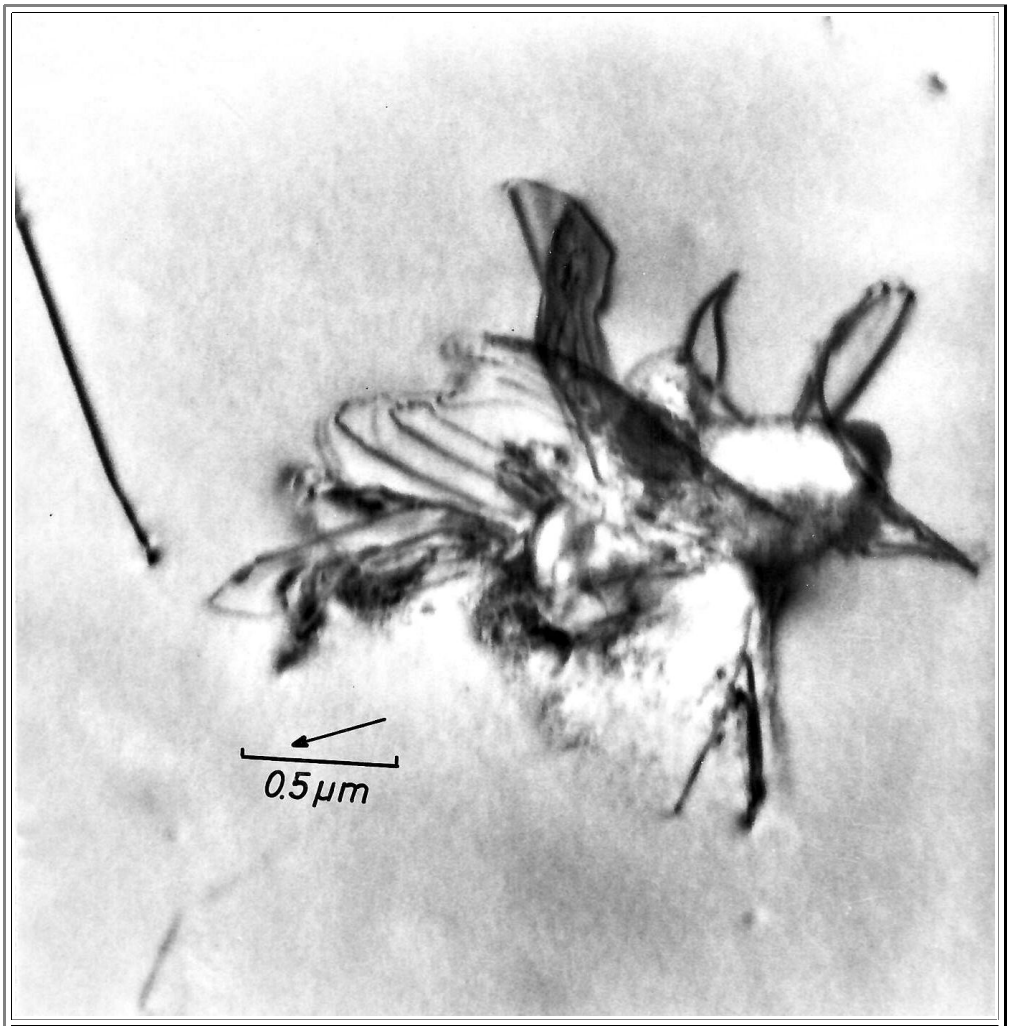


Fig. 2A in publication.

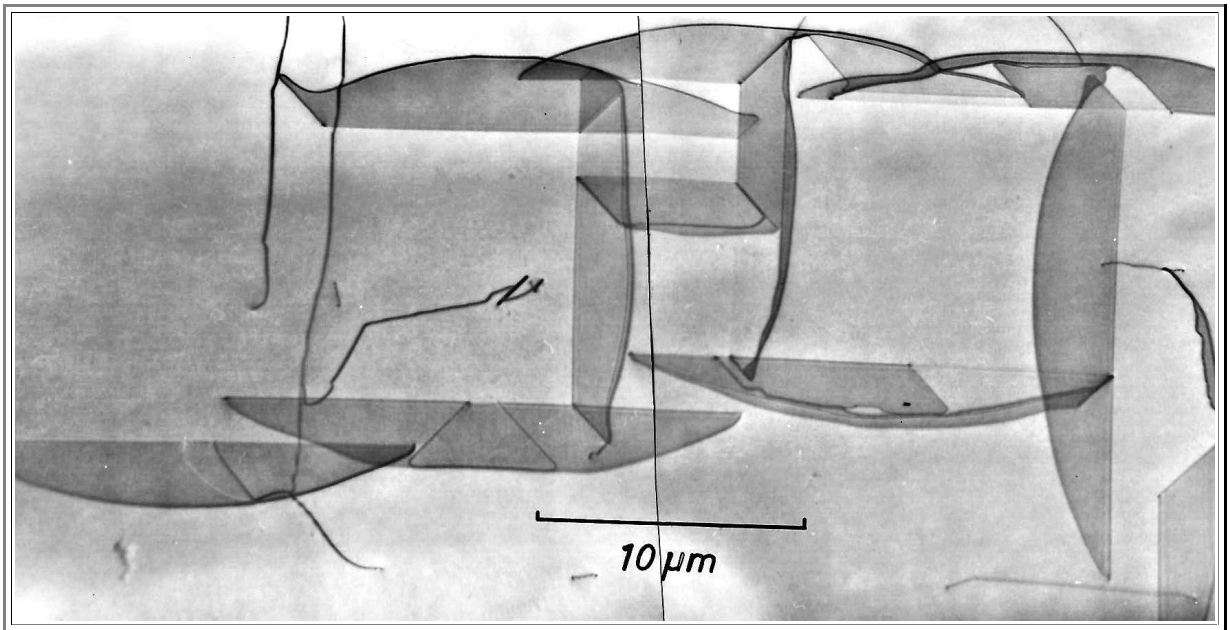


Fig. 3 in publication.

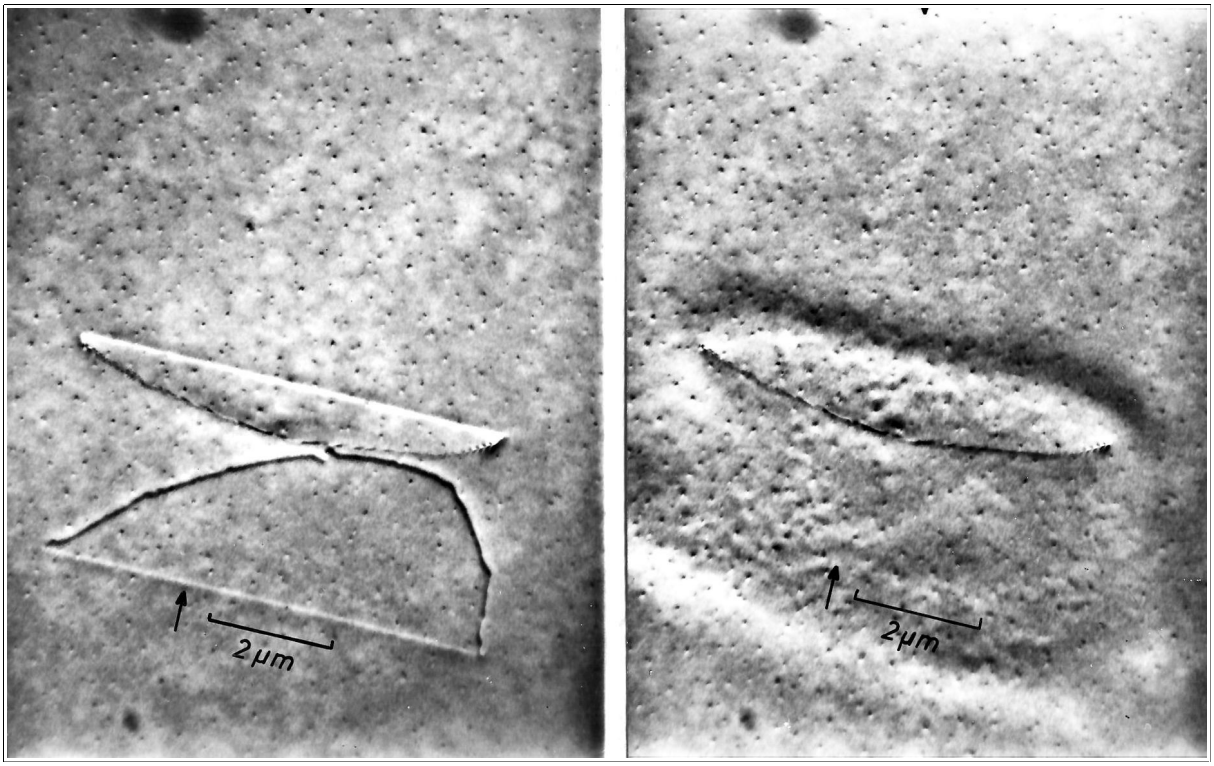
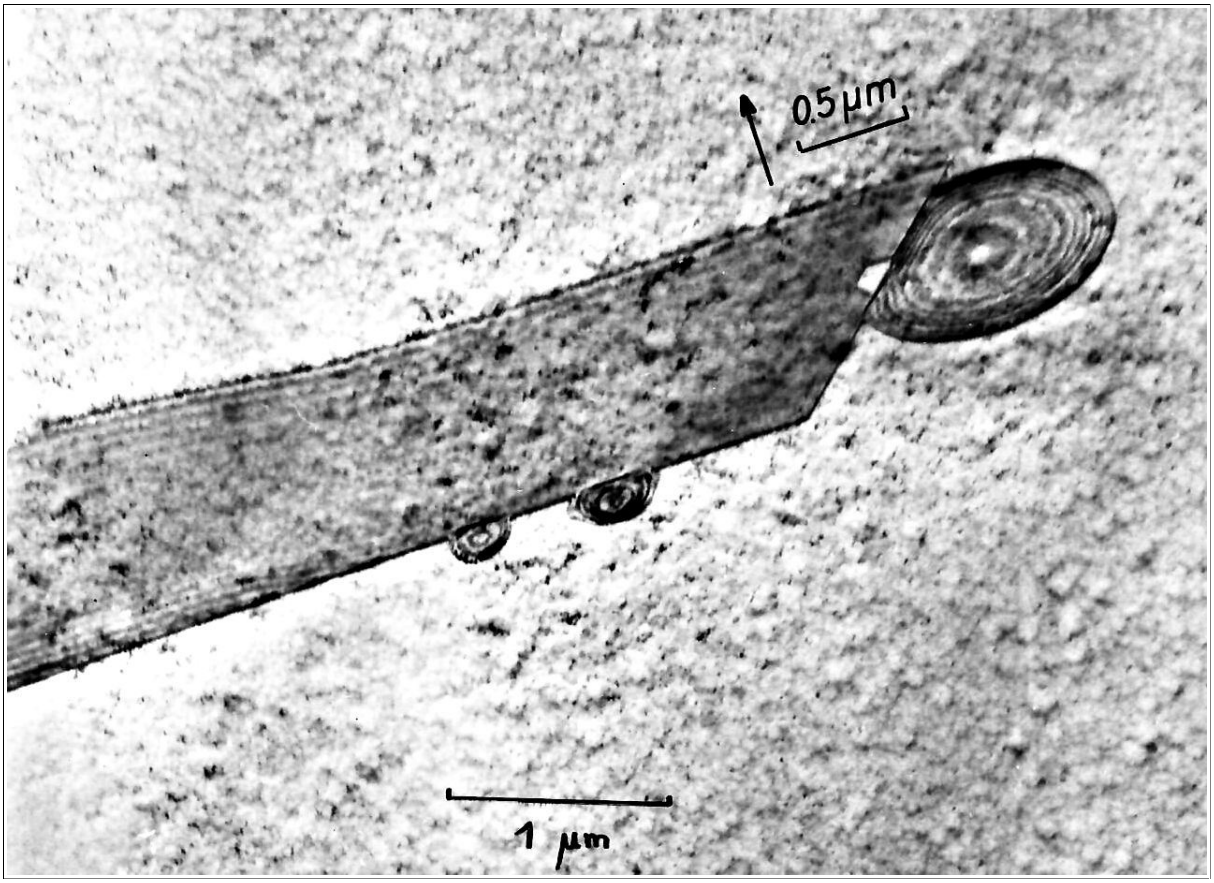
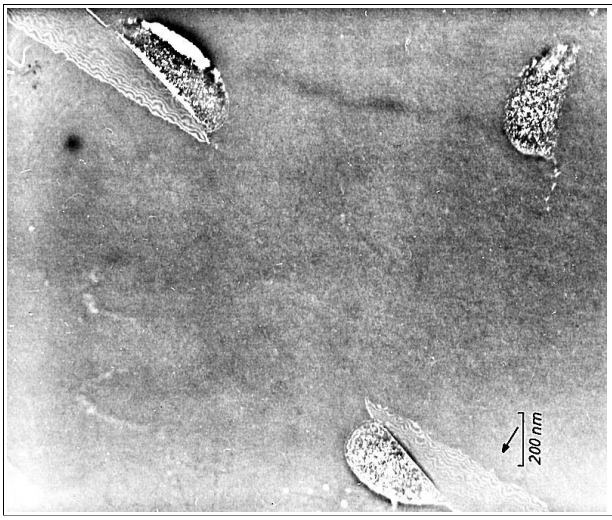


Fig. 8 inb publication.



.**Fig. 9a) in publication**



Contains Fig. 9b) in publication

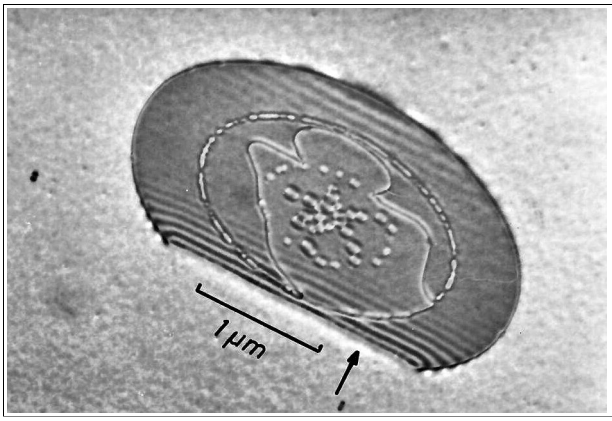


Fig. 10b in publication.

Links to

- **Auxiliary Pictures Part 2**
- **Auxiliary Pictures Part 3**