It was established that the frequencies of oc-
currence of layers o and t (representing here
structures 2H and 4H) in a polytype cell are
correlated with relative stabilities of basic
structures 2H and 4H in given conditions.
It was observed that in some specific condi-
tions pure large polytypes form, in others
disordered structures occur frequently. The
mechanism of formation of polytype structures
in CdI_2 is in case (i) the competition bet-
ween 2H- and 4H-type stackings of molecular
layers and in case (ii) the competition bet-
ween differently oriented domains of 4H-type
stackings (e.g. a slip along [11.0] direc-
tion and generation of fault sequences f4f5).
The present study do not allow us to decide
in which way the inter-phase boundaries
created during growth are repeated perio-
dically and form large period polytypes.

**20.3–5   SOME ASPECTS OF SYMMETRY OF POLYTYPE
STRUCTURES MX_2.   By B.Pałosz and S.
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Determination of the symmetry of a polytype
may be performed directly on the basis of X-ray
pattern, while the determination of the space
group is possible only after complete determi-
nation of the layer stacking of a polytype
cell. The information of a space group of a
polytype is practically useless in the analysis
of the reasons for polytypism and in the des-
cription of the structural behaviour of the
crystals.   For the characterization of polyty-
pe structures we suggest the use of the t-o-f
molecular layer notation [Pałosz,B. Z.Krist.
(1980) 153, 51-72] where the sequences which
form polytypes may be divided into hexagonal-
and rhombohedral-type stackings. In this no-
tation it is clearly seen that hexagonal and
rhombohedral structures are fully equivalent
structures: a hexagonal cell may in some ca-
ses be constructed only of rhombohedral-type
arrangements of layers of which a rhombohedral
cell may also be composed.   Similarly, hexa-
gonal-type arrangements of layers may form
hexagonal as well as rhombohedral polytypes.
The existence of such semi-hexagonal and
semi-rhombohedral structures have been con-
firmed experimentally in a tens of identified
polytypes of CdI_2 and SnS_2; Pałosz,B. Acta
Cryst. C39 (1983) 1160-1163, Pałosz, B.,
Pałosz,W. and Gierlotka, S. Acta Cryst.
(1984) submitted.

**20.3–6   POLYTYPISM, SUBGROUP RELATIONS AND
SUPERPOSITION STRUCTURES.** By O. Jarchow,
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A new method of derivation and description of
of polytype structures will be presented.
All space groups of the hexag. and tetragonal
system and their subgroups are decomposed in
layer groups parallel and perpendicular to the
symmetrical directions and arranged to the a,b-
plane of layer dimensions. For space groups
and their subgroups of the 6mm and 4mm point
groups existing only one kind of layer groups
in every space group. In all the other space
groups their exist two maximum and one mini-
mum layer groups, with the minimum group as
commen subgroup in the both max. groups.
All in all we find 409 different sequences
with maximum and 212 with a minimum symmetry
of the layers.
As known from disordered polytypes, pseudo-
translations a/2; a/4;(-a+b)/3 etc. between
adjacent layers give rise to sharp and diffuse
spots in diffraction images. The sharp spots
belong to a superposition structure (SPS) with
a regular space group (Dornberger-Schiff,1964),
that means, they belong to one of the regular
sequences. The transition from SPS to polytypes
may be described by transformations like ma,
nb, pc, These transformation matrices together
with the symmetry of the SPS give the entrance
of tables, which allow to determine the dif-
ferent classes of polytypes. From other tables,
containing the transformed symmetry operators,
we get the informations about space group and
partial operators. To avoid a description by
partial symmetry operators, we take in account
the strong relations between polytypes and their
SPS.
Above all the MDO concept of Dornberger-Schiff
(Abh. Dt. Akad. Wiss. 1964) about polytypes
with maximum degree of order has given new ad-
vances in structure determination of polytypes.
It will be shown, that these MDOs are in close
relationship to twin- and antiphase domains
defined by Wondratschek & Jeitschko (Acta Cryst.
A 32, 664) and that the use of group-subgroup
relations have also many advantages in deriva-
tion and description of polytypes.
By generalisation of the procedure in a simple
way it is also possible to include polytypes
without SPS and also with different kind of
layers.
The usefullness and practical application of
the method will be demonstrated on some exam-
ples.