thod could be used to very
one version, could be changed
the other hand, in order to
ıad to undergo plastic defor-
xperiments such as the effect
tion temperature or on poly-
ı work on galvanomagnetic
e effects many times greater
64).

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ov and Itskevich (1963) and
15 kb) is first generated by a
ture where the oil–kerosene
ly solidified by cooling and
be cooled to helium tempera-

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-pressure techniques used at
ı used in studies of the super-
may well come into greater
ıtures is extended. Some ver-
do the techniques A and D
med to room temperature to
-pressure techniques (up to
nperatures (see, for example,
er, 1963).

AS

nerated in fluid helium at a
e corresponding solidification
nen allowed to solidify around
oling. This process can either
lly by Dugdale and Hulbert,
er method was introduced by

Swenson and his collaborators and is a great improvement on the constant volume technique (Hinrichs and Swenson, 1961; Schirber and Swenson, 1961, 1962). It is an improvement in several ways: first the retained pressure at the lowest temperature (after cooling the solidified helium to say 1° K) is appreciably higher than in the constant volume method where about one quarter is lost, largely because of the contraction on freezing. Secondly the fluid pressure obtained

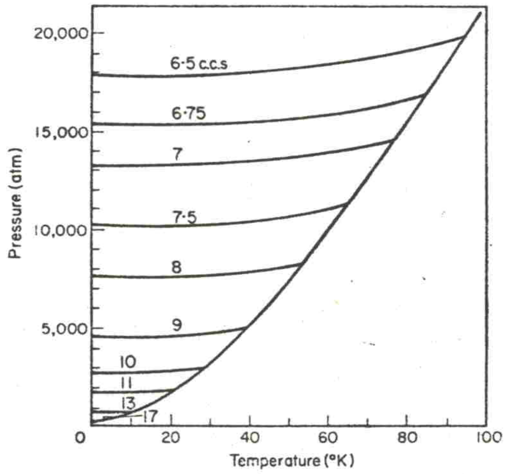

Fig. 1. Melting curve and lines of constant volume in solid ^{4}He: the numbers indicate molar volumes. (From Dugdal, 1958.)

is known more accurately since the correction derived from the equation of state of helium is smaller (Dugdale, 1958); see Fig. 1. And thirdly, the non-hydrostatic stresses imposed on the specimen can be made extremely small. In the solidification process at constant pressure the solid helium can grow from the fluid around the specimen from the bottom; if this is done slowly there should be no shear stresses on the specimen. Thereafter if the apparatus is cooled at constant volume, non-hydrostatic stresses will arise only because of the difference in thermal expansion or contraction of the specimen and the solid helium. At low temperatures thermal expansion or contraction is small so that there will be no appreciable relative movement of solid helium and specimen provided the initial temperature is not too high. Consequently the pressure remains essentially hydrostatic.

When we come to consider the work on Fermi surfaces we shall have occasion to compare directly the results of some of these techniques.