

TABLE IV

Partial analyses of feldspars from selected runs on the gabbroic anorthosite composition (iron content recalculated to zero)

Conditions of run	18 kb	18 kb	18 kb	9 kb	9 kb
	1 hr 1375 °C	1 hr 1350 °C	1 hr 1315 °C	1 hr 1330 °C	1 hr 1300 °C
SiO <sub>2</sub>	54.8	54.7	55.7	52.6*	52.5*
Al <sub>2</sub> O <sub>3</sub>	28.5*	28.8	27.6*	30.1	29.8
CaO	11.2	10.7	10.1	12.6	12.3
Na <sub>2</sub> O	4.6	5.2	5.1	4.2	4.3
K <sub>2</sub> O	0.5	0.4	0.8	0.3	0.3
	99.6	99.8	99.3	99.8	99.2
<i>Mol. Prop.</i>					
Or	3.0	2.3	4.6	1.7	1.7
Ab	41.4	45.7	45.5	37.0	38.1
An	55.6	52.0	49.9	61.3	60.2

\*Denotes calculated content.

liquids of suitable refractive index, and as polished discs, and also from examination of X-ray powder photographs, estimates of the amounts of crystalline phases present have been made. In Table IX compositions are given of possible liquids fractionating from the quartz diorite when it is partly crystallized. These are residual compositions calculated by extracting the estimated amounts of crystals of measured composition

from the initial quartz diorite composition. The liquid fractionates are broadly granodiorite to adamellite in composition, while the crystalline residuum approximates a gabbroic anorthosite composition. Calculated compositions of crystal separates of gabbroic anorthosite and anorthosite modes are given as well.

The effect of pressure on the compositions of possible liquids fractionating from the quartz

TABLE V

Analyses of pyroxenes from selected runs on the gabbroic anorthosite composition

Conditions of run	27 kb	27 kb	36 kb
	1 hr 1340 °C	1 hr 1350 °C (Wet run)	1 hr 1450 °C
SiO <sub>2</sub>	46.7	45.4	46.0
TiO <sub>2</sub>	1.3	1.4	0.8
Al <sub>2</sub> O <sub>3</sub>	24.5	23.9	27.2
FeO	4.8	1.4	2.8
MgO	4.8	6.2	4.8
CaO	17.0	19.5	16.5
Na <sub>2</sub> O	2.6	2.4	3.4
TOTAL	101.7	100.2	101.5
100 Mg	64.0	88.9	75.4
Mg+Fe			
	<i>Numbers of ions on the basis of 6 oxygens</i>		
Si	1.6433	1.6049	1.6069
Al	0.3567	0.3951	0.3931
Al	0.6593	0.6005	0.7267
Ti	0.0345	0.0372	0.0210
Fe	0.1413	0.0414	0.0819
Mg	0.2519	0.3268	0.2500
Ca	0.6408	0.7366	0.6174
Na	0.1772	0.1644	0.2301
Mg	24.4	29.6	26.3
Fe	13.7	3.7	8.6
Ca	61.9	66.7	65.1

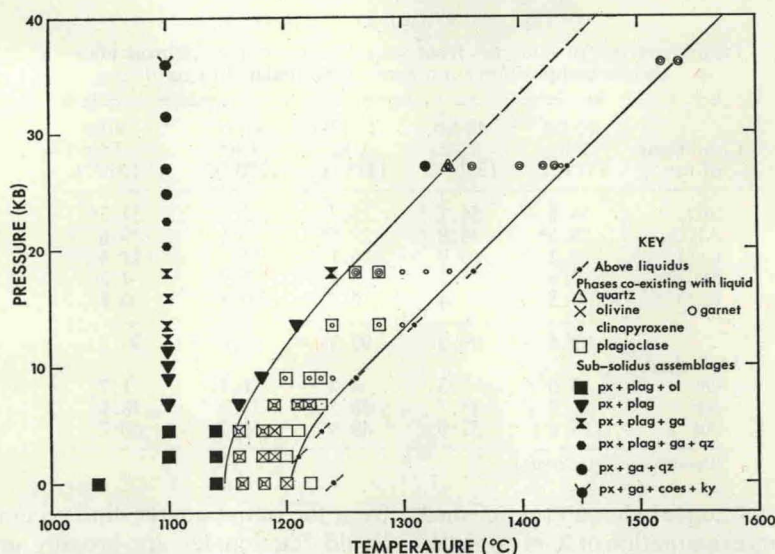


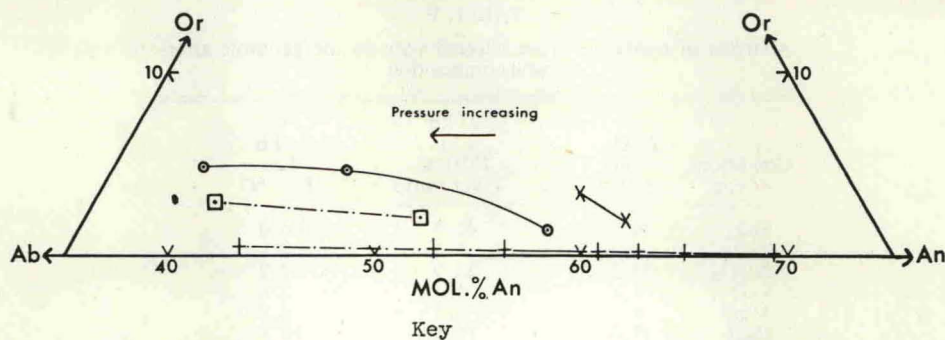
FIG. 3. Results of the experimental runs on the high-alumina basalt composition.

diorite and on the compositions of crystalline residua of gabbroic anorthosite modes is emphasized by considering the  $K_2O/Na_2O$  and  $CaO/Na_2O$  ratios. Both ratios increase with increasing pressure for the liquid fractionates, and corre-

spondingly decrease with increasing pressure for the crystalline residua.

#### Gabbroic Anorthosite

At pressures of 22.5 kb and less, large crystal



Plagioclase from:	Pressure range (kb)
+ high-alumina basalt	0 - 18
□ basaltic andesite	9 - 18
○ quartz diorite ( $\approx$ andesite)	0 - 13.5
x gabbroic anorthosite	9 - 18
— denotes plagioclase liquidus phase	
- - - denotes plagioclase co-existing with pyroxene or garnet	

FIG. 4. Variation in composition of plagioclase with pressure.