TABLE II.

Fractional Distillation of Dry Fusel Oil.

B. P. Fraction	Per cent.		Opt. Rotn.	n^{27}_D	Sp. gr. 27
	Sample (*a*)	Sample (*b*)			
C°					
75–76	0·9	..	..	1·362	·7984
76–77	2·5	0·3	..	1·3625	·7989
77–78	4·4	4·5	..	1·363	·7995
78–79	5·3	5·4	..	1·365	·8019
79–80	1·5	4·3	..	1·366	·8041
80–82	3·4	7·4	..	1·368	·8076
82–85	1·5	3·7	..	1·371	·8097
85–90	1·2	2·5	..	1·375	·8095
90–95	3·5	0·6	..	1·3755	·797
95–100	3·8	0·9	– 0·7	1·382	·796
100–110	4·0	2·2	– 1·2	1·390	·7998
110–120	9·6	2·8	– 2·3	1·397	·7998
120–125	11·9	1·8	– 3·6	1·402	·802
125–128	27·1	40·6	– 6·8	1·4045	·8045
128–130	3·4	3·0	6·5	1·405	·805

The earlier alcohol fractions were not entirely dry, but the use of barium oxide for drying resulted in losses, due to its combination with some of the alcohols and also mechanical losses.

From comparative determination of the properties of alcohols (Merck's) with distillate fractions from two samples of fusel oil taken (*a* and *b*)—III—it is found that the fusel oil has the approximate composition:—water—18%; ethyl alcohol—8%; *iso*propyl alcohol—0·5%; *n*-propyl alcohol—18%; *iso*butyl alcohol—5·5%; *n*-butyl alcohol—6%; *iso* and active amyl alcohol—41%; *n*-amyl alcohol—3% and traces of free acids—0·01%.

It is seen that this fusel oil can serve as a source for the higher alcohols and for fairly large supplies of amyl acetate for industrial uses.

TABLE III.

Components of Fusel Oil.

	Per cent.	
	Sample (*a*)	Sample (*b*)
Water	16·0	20·0
Ethyl alcohol ..	7·8	8·0
*Iso*propyl alcohol ..	10·4	0·5
Propyl alcohol ..	16·0	20·2
*Iso*butyl alcohol ..	7·8	3·1
n-Butyl alcohol ..	9·6	2·8
Iso and active amyl alcohol	39·0	42·4
n-Amyl alcohol ..	3·4	3·0

Y. N. RAGHUNATHA RAO.
Distillery,
Mysore Sugar Company, Ltd.,
Mandya,
July 5, 1938.

[1] *Distillation Principles and Processes*, by S. Young.
[2] *Alcohol*, by C. Simmonds.

Observations on the Liberation of Helium from Monazite by Heating.

THE preparation of helium from monazite is well known but as appreciable quantities of helium were required by us for our work on the adsorption of helium by charcoal (cooled in liquid air), several lots of monazite were heated under different conditions and the yield and rate of evolution of helium were studied.

The monazite employed was from Travancore, and it contained 7·2 per cent. of ThO_2. The main bulk (98 per cent.) of the naturally occurring material passed 40-mesh sieve and this was used for the heating experiments either in this condition or after crushing to 80-mesh.

The first set of experiments were carried out with a view to determine the temperature and period for which the material available to us had to be heated in order to obtain a satisfactory yield of helium. The electric furnace used could be maintained approximately steady (± 10°) at temperatures up to 1,100–1,200° C. The purification of the gas obtained was effected as usual, the cocoanut-shell charcoal cooled in liquid air having been degassed previously in a Töpler vacuum by heating for over 24 hours in a bath of sulphur vapour. The measurement of the volume of helium was carried out in a constant volume burette[1] having two fixed glass pointers which corresponded to 2·742 c.c. and 9·380 c.c. respectively. The error in the determination of volume was not more than 1·5 c. mm. in any experiment.

As a result of several trials it was found that in order to liberate all the helium from the sample in a reasonably short period (4 hours), it was necessary to heat the material at a temperature of about 1,000–1,100° C. The quantities of helium obtained from the 40 and the 80-mesh samples were respectively 0·850 and 0·903 c.c. per gram of the material. The rate of evolution of helium when monazite is heated at 1,100° C. in a Töpler vacuum was studied, and the results of one typical experiment showing the quantities evolved during the progress of heating are given below:

Period of heating (in hours) ..	0—½	½—1	1—2	2—4	4—5
Helium obtained (percentage of total)	90·7	5·8	1·5	2·0	0·0

P. R. SUBBARAMAN.
K. R. KRISHNASWAMI.

Department of General Chemistry,
Indian Institute of Science,
Bangalore,
July 29, 1938.

[1] *J. Ind. Inst. Sci.*, 1934, **17 A**, Part III, 36.

Spilitic Rocks from Chitaldrug, Mysore State.

IN a short paper published a few years ago,[1] the present writer gave a general petrographic account of the trap rocks of the Chitaldrug Schist Belt. The present note deals with the Jogimardi trap (the Chitaldrug grey trap of some writers), and the dark hornblendic trap of Chitaldrug.

The Jogimardi trap is a grey coloured, heavy basic rock. It exhibits a great variety of textures, varying from glassy and fine-grained types, to coarse rocks with ophitic or sub-ophitic textures. Sometimes, these rocks are also porphyritic. Augite, mostly altered to uralite and chlorite, and decomposed plagioclase, constitute the important minerals. The feldspars are invariably altered, but in a few favourable cases it was possible to determine that the refractive index was distinctly lower than that of Canada balsam; the species may therefore be referred to albite or acid oligoclase. Quartz occurs sporadically. Feebly pleochroic pale yellow epidote, and calcite are the common secondary minerals. Sphene and ilmenite are always present. These traps do not contain olivine or rhombic pyroxene.

The dark hornblendic trap is of a deeper colour than the Jogimardi trap, a character mainly due to the colour of the amphibole, which is deep-tinted with well-marked pleochroism from yellow to green to greenish blue. The feldspars are highly altered and so it is not possible to determine their exact nature. There is no augite in any of the sections examined by the writer. Magnetite, pyrites, and ilmenite occur as accessories. In a few cases, an ophitic texture is just discernible.

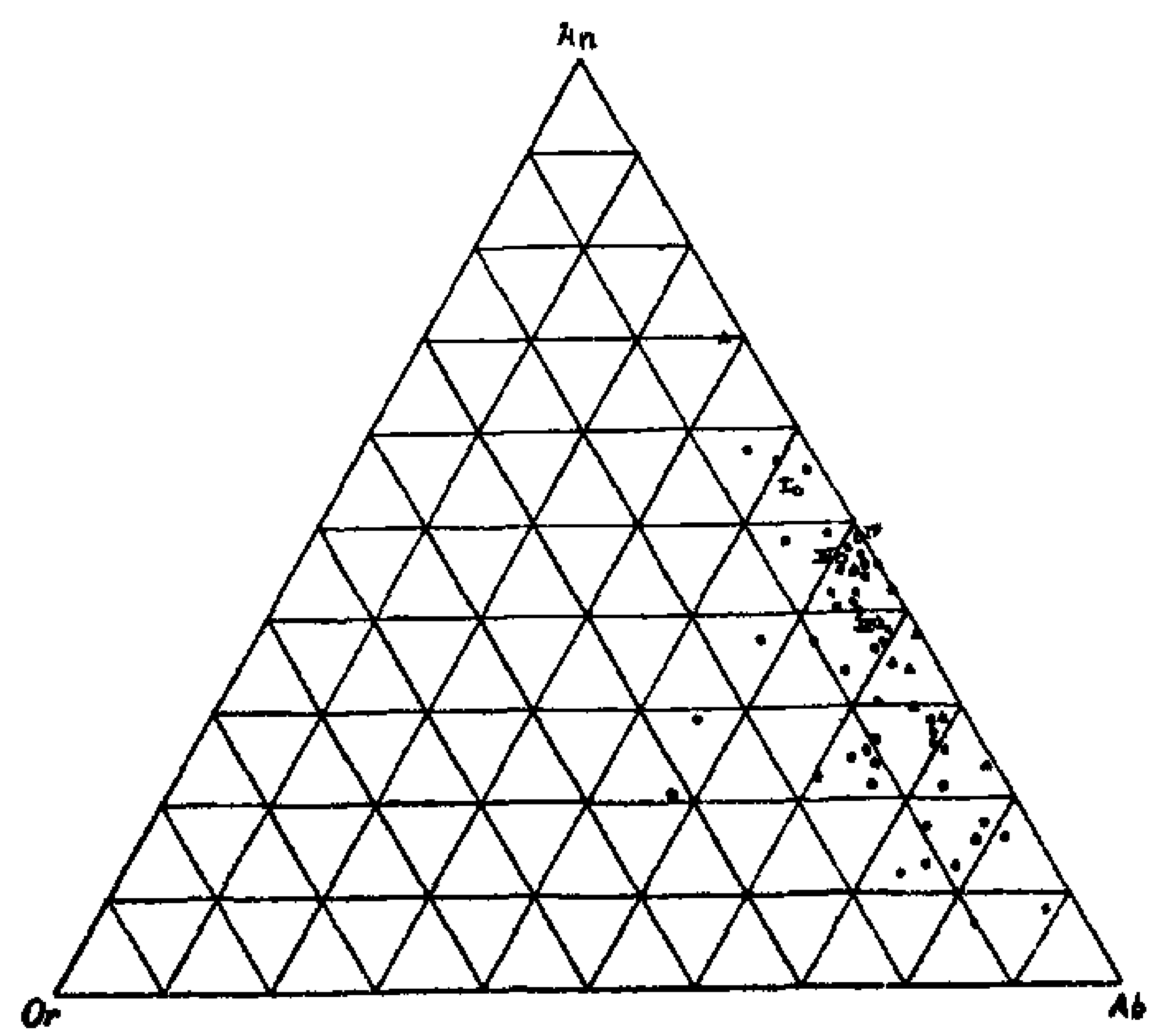

FIG. 1.

Molecular percentages of normative feldspars of spilites. British spilites are represented by triangles and the Chitaldrug rocks by circles. Spilites from other parts of the world are indicated by dots.