been well established that the curve obtained by plotting galvanometer deflexions against percentages of hydrogen or helium present in air was a straight line through the origin. The calibration showed that (1) 259 mm. deflexion on the scale 1 metre from the galvanometer represented 1 per cent. hydrogen in air, and (2) 163 mm. deflexion on the scale 1 metre from the galvanometer represented 1 per cent. of helium in air.

The following table gives a comparison of the results obtained in the present experiments with those obtained by Elworthy and Murray when using the same fabrics. In each case the permeability is given as being the number of litres of gas permeating 1 square metre of a fabric in 24 hours:—

TABLE I.

	Results obtained in this investigation. Temp. 20° C.		Results obtained by Elworthy and Murray. Temp. 15°·5 C.	
Fabric No.	Method I. Using Katharometer.	Method II. Using Katharometer.	Method I. Using Interferometer.	Method II. Using Katharometer.
*II. B	9·6	9·8	8·4	9·7
III. A ...	8·4	8·0	0	8·6
IV.	5·0	...	5·5	4·7
V. B	6·3	...	6·7	6·4
VI. A ...	8·0	...	...	8·1
VI. C.....	7·8	7·5	...	8·1
XII.	5·4	...	...	...

IV. *Permeability of Films.*

After the preliminary experiments had been made, an attempt was made to employ the same method in making a determination of the transfusion of hydrogen and of helium through a soap film. Sir James Dewar † in a paper presented at a meeting of the Royal Institution of Great Britain in Jan. 1917, described many interesting experiments with long-lived soap bubbles and films, among them being a determination of what he calls "gas transference" through

* The fabric numbers refer to samples of balloon fabrics described in the papers by Elworthy and Murray.

† Dewar, Paper, "Soap Bubbles of Long Duration," presented at weekly meeting of the Royal Institution of Great Britain, Jan. 19, 1917.