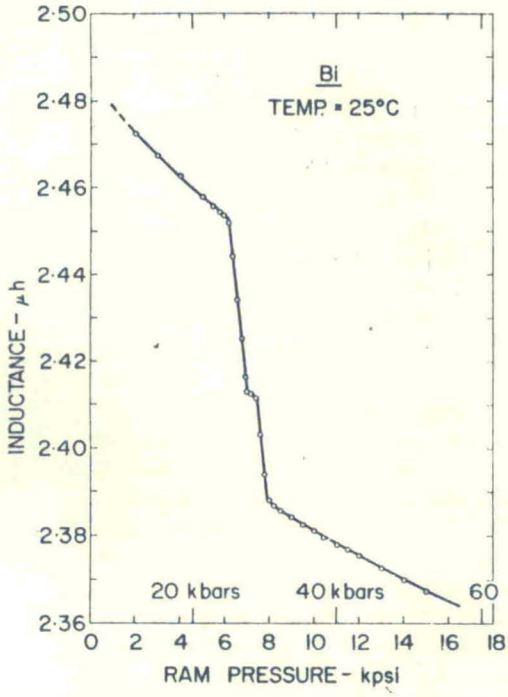

FIG. 1. Inductance of a coil wound on a threaded Bi core as a function of ram pressure at room temperature. Lead inductance was 0·5800 μH.

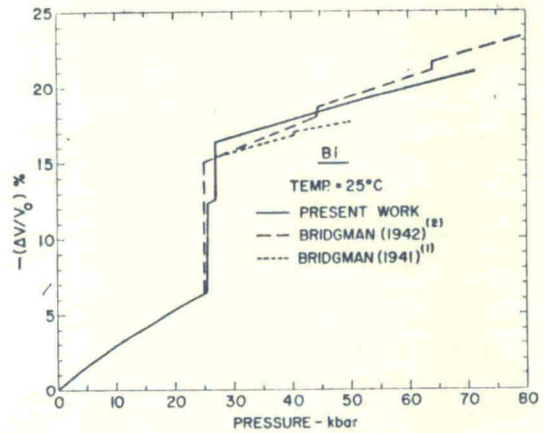

FIG. 2. Compression curve of Bi at 25°C.

The compression curve of Bi to 60 kbar at 25°C is shown in Fig. 2 which also shows Bridgman's results for comparison. The data is tabulated at 5 kbar increments in Table 1. These results are based on eight runs for which the experimental set-ups differed among each other in some respect, such as sample size, pressed powder vs. cast samples, thickness of silver chloride jacket (when used), and whether or not a thin pyrophyllite sleeve was placed on the coil before enclosing it in silver chloride. On completely identical set-ups the reproducibility was better than ±2% of the vol. changes themselves.

Table 1. Compression of Bismuth at 25°C. The listed values are the means and standard deviations for eight experiments*

P (kbars)	$-(\Delta V/V_0)$ %	P (kbars)	$-(\Delta V/V_0)$ %
0	0	35	17·2 ± 0·8
5	1·5	40	17·8 ± 0·9
10	2·8	45	18·3 ± 0·9
15	4·1	50	18·9 ± 0·9
20	5·3	55	19·4 ± 1·0
25	6·3	60	19·9 ± 1·0
30	† 16·7 ± 0·8		

* Matched with BRIDGMAN's[2] data up to 20 kbar.

† (i) Transition at 25·4 kbar; compressions −6·4% to −(12·2 ± 0·4)%; (ii) Transition at 26·8 kbar; compressions −(12·4 ± 0·5)% to −(16·0 ± 0·8)%.

The over-all results are in fairly good agreement with Bridgman's data. The most significant differences occur in the region of the transitions. The Bi_{I-II} and Bi_{II-III} transitions occur so close together in pressure that it was beyond the resolving powers of Bridgman's 50 kbar[1] and 100 kbar[2] apparatus to separate them. In earlier lower pressure work, however, he reported the vol. changes at the two transitions separately.[9] Table 2 compares the results and also includes LAMORI's[10] data obtained by the piston displacement technique.

The ratios of the sudden vol. changes I–II: II–III varied between 1·41:1·0 and 1·60:1·0 for the various runs. By way of comparison BRIDGMAN's data[9] yielded a ratio of 1·53:1·0 and that of LaMori 1·33:1·0. It is not clear why there should be such a large scatter in this ratio. In his resistance work, BRIDGMAN[3] also observed a wide variation in the ratio of the resistance changes