METHANOL

Production and Use

Methanol (wood alcohol), originally produced by wood distillation, is now synthesized from water-gas produced from coke and steam. The production process, equipment, and raw materials are practically identical with those of ammonia synthesis. The only significant difference is that in ammonia synthesis carbon monoxide must be removed from the nitrogen and hydrogen, in a step not required for methanol.

With a slightly modified catalyst the methanol process may yield isobutyl alcohol, raw material for the manufacture of aviation gasoline. The location of existing and planned facilities for methanol production are shown in Figure 7.

The annual production of methanol in Germany during prewar and early war years follows:

Year	*Metric Tons*
1938	78,000
1939	74,000
1940	89,000
1941	120,000

The production records and information gained from questioning German industrialists revealed methanol's importance to the German war effort. Table A9 shows the production and allocation to major consuming industries based on a plan made in October, 1942; the planned production is also shown in Figure 8. Dispersing production reduced the hazard of depending only on the plant at Leuna.

Adequate expansion was provided to meet the increasing demands, and considerable flexibility was inherent in the interchangeability of ammonia, isobutyl alcohol, and methanol production. The requirements are indicated graphically in Figure 9, and production, stocks, and allocations are shown in Figure 10.

Table A10 shows that production was substantially as planned in 1943, 47 per cent in 1944, and only about 10 per cent during the first three months of 1945.

Effects of Bombing on Production

The effects of the bombing of Oppau during the winter of 1943-44 were even more disastrous to methanol than to ammonia production. There was no production on 134 out of 176 days during the period. From May, 1944, to April, 1945, inclusive, 32,000 tons of bombs were dropped on Leuna and Oppau, which together had produced 52 per cent of Germany's methanol. This resulted in a loss of 163,000 tons, or 40 per cent of the planned production for the period.

The methanol plants at Auschwitz and Heydebreck, starting operations in the fall of 1943, had come to the rescue, but were themselves bombed beginning July, 1944. From 1 July to 31 December 1944, 4,800 tons of bombs were dropped on Auschwitz and Heydebreck, causing a loss of 62,000 tons, or 30 per cent of the planned production for the period.

TABLE A9. PLANNED PRODUCTION AND CONSUMPTION OF METHANOL

(Thousands of Metric Tons per Year)

	1942	*1943*	*1944*
Planned Production			
Leuna	164.4	181.5	183.5
Waldenburg	4.8	45.6	63.6
Heydebreck		14.1	76.8
Auschwitz		3.	45.
Oppau		15.	18.
Degussa	1.2	1.2	1.2
TOTAL	170.4	260.4	388.1
Planned Consumption			
Powder and explosives	43.	119.	177.
Rubber	6.	38.	48.
Solvents, lacquers, etc.	76.	87.	97.
Other	54.	74.	88.
TOTAL	179.	318.	410.

TABLE A10

PRODUCTION AND STOCKS OF METHANOL

(Thousands of Metric Tons Per Year)

	1943	*1944*	*1945*
Planned	260.4	388.1	408 (rate of Dec., 1944)
Actual	249.1	181.4	40 (rate of Jan., Feb., March, 1945)
Stocks in thousands of metric tons	No data	27.5	15.0

The effects of bombing on methanol production are shown in Figure 11. Production of isobutyl alcohol at Leuna and Oppau together was greater than their methanol production, and was similarly affected.

Changes in Planning as the Result of the Air Offensive

As a result of the air offensive, drastic revision of allocations to the various industries were necessary. This principally affected industries which were related only indirectly to the war effort. The explosives industry also suffered, but obviously this had high priority. However, supplies of methanol used in the manufacture of toluene and in chemical warfare were drastically reduced. Also, a cut was made in the allocation to the rubber industry, which already was suffering from a shortage of raw materials as a result of the bombing offensive. The manufacture of hexogen was also curtailed. This directly resulted in munitions containing reduced quantities of high explosives; it has been more fully discussed in the section on explosives in the Oil Division report.

Toward the end of 1944, it was planned under the Geilenberg program to convert from nitrogen to methanol production in two small plants, namely, Fuerstenberg-on-Oder, and Linz, in May, 1945. A plant designed for production of 2,000 tons per month of methanol from gases from carbide ovens was scheduled to start in May, 1945, at Schkopau. Similar small emergency plants were under consideration for Piesteritz, Fuerstenberg, and Trostberg, but did not materialize before the occupation.

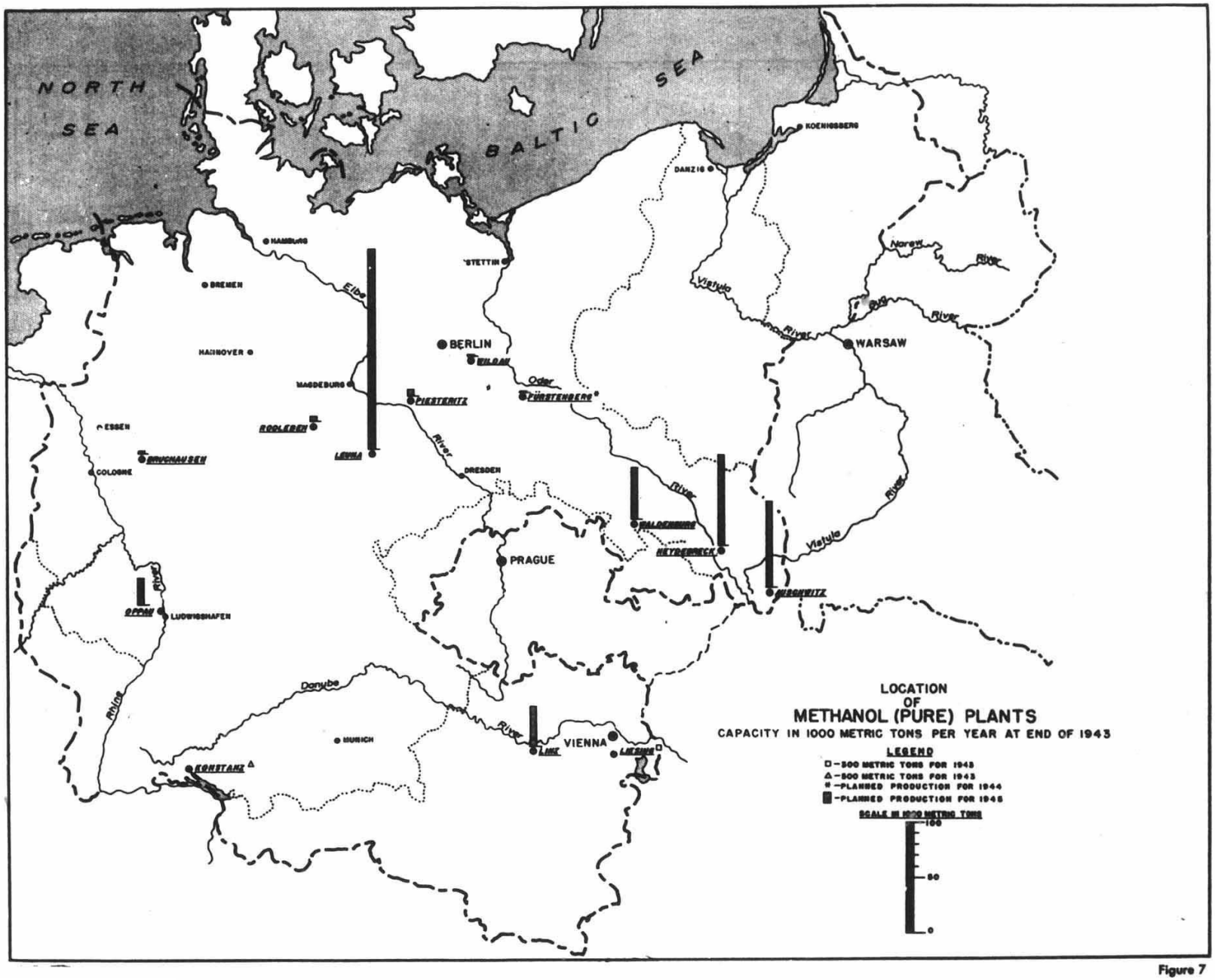


Figure 7

METHANOL (PURE)

PLANNED PRODUCTION AND CONSUMPTION

(AS OF OCTOBER 1942)

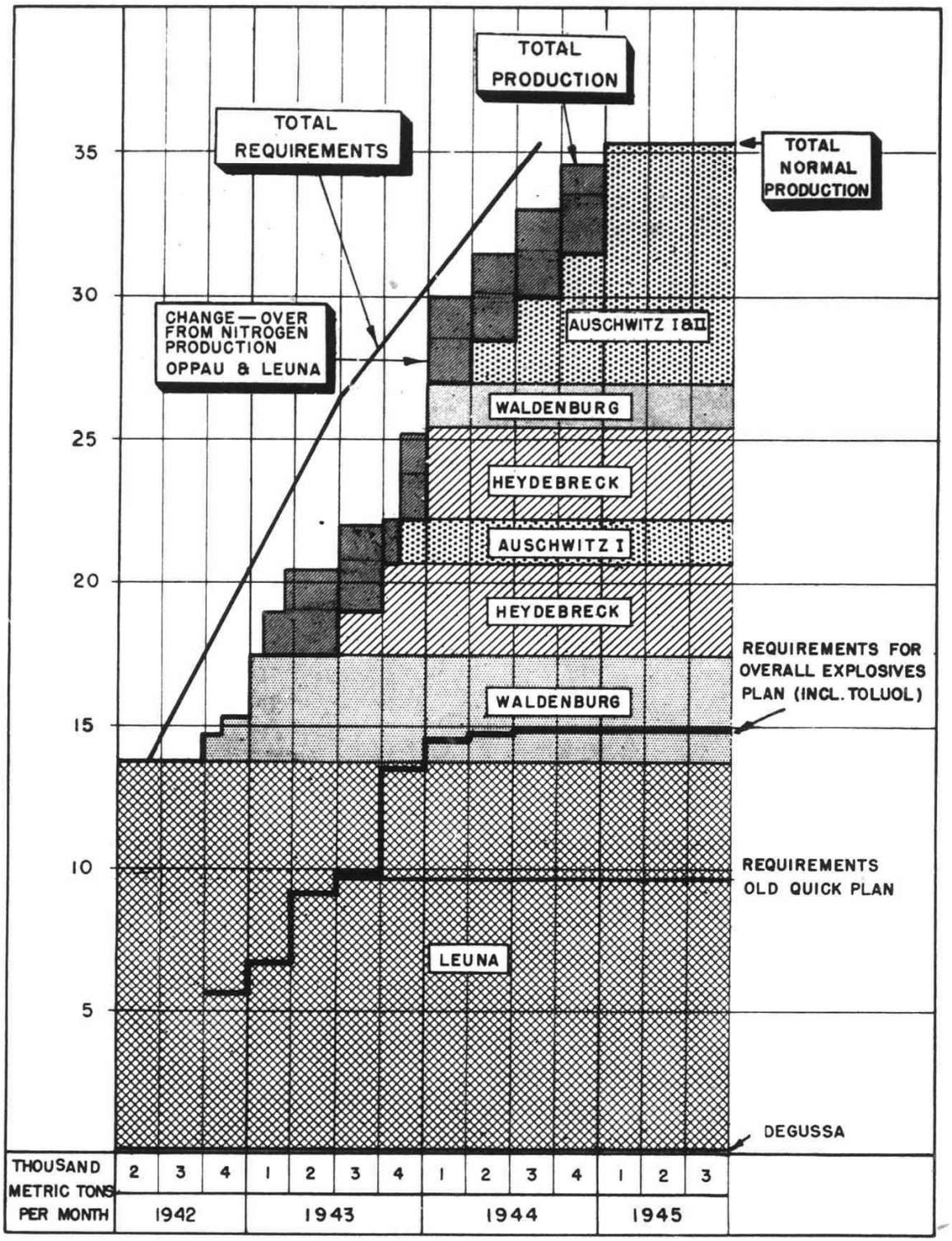


Figure 8

METHANOL (PURE)

REQUIREMENTS BY PRINCIPAL USES

PLAN OF OCTOBER 1942

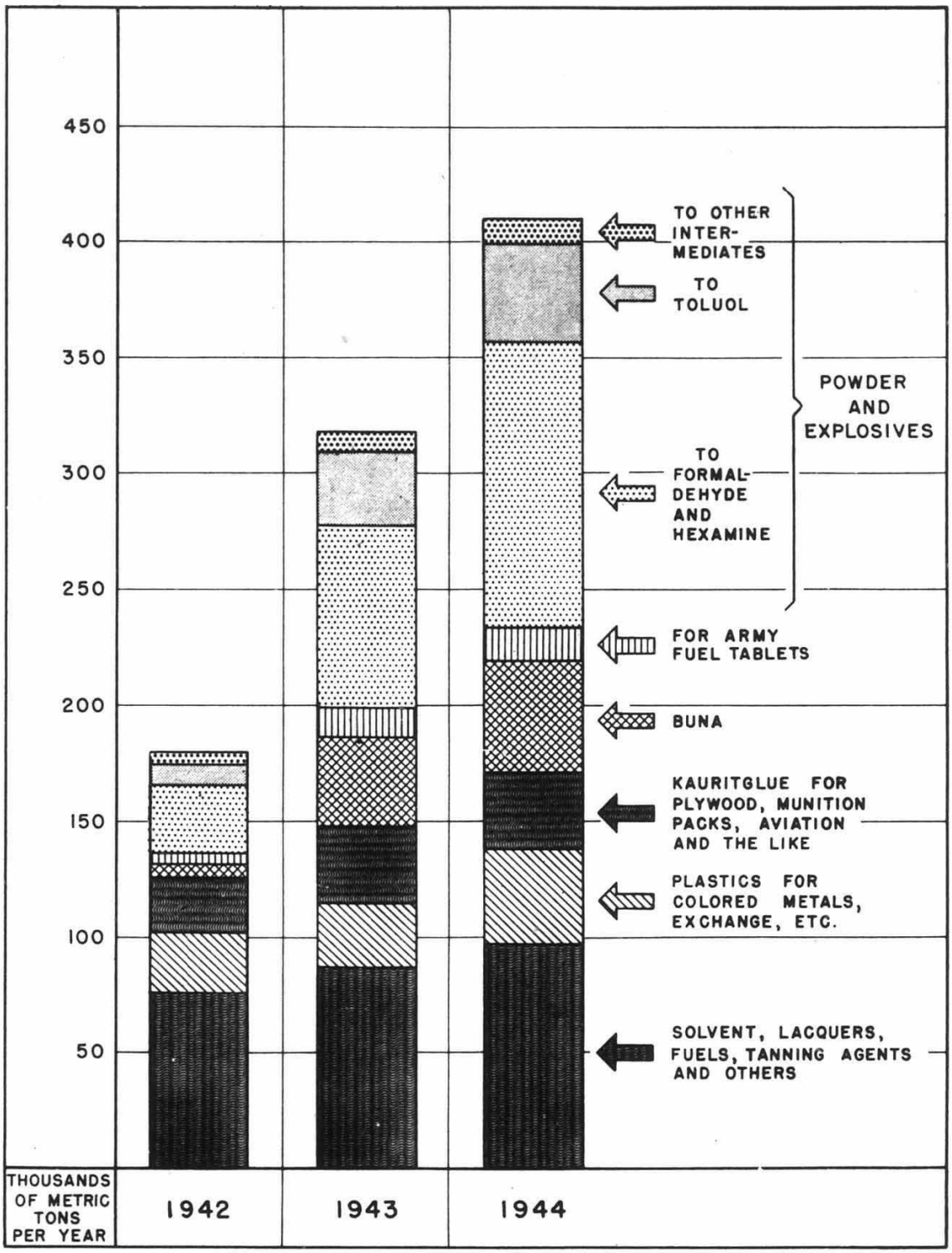
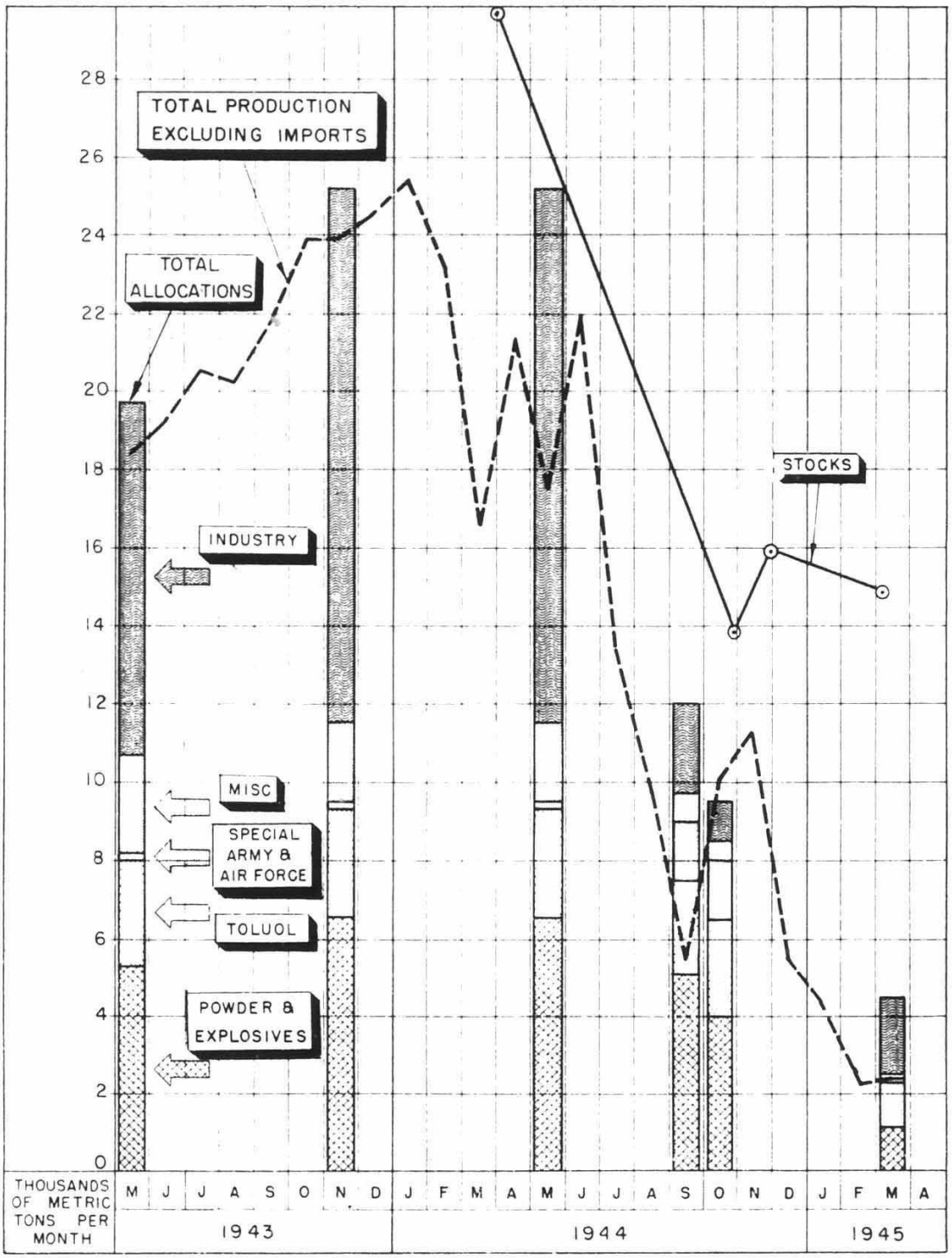


Figure 9

METHANOL (PURE)

PRODUCTION, STOCKS AND ALLOCATIONS

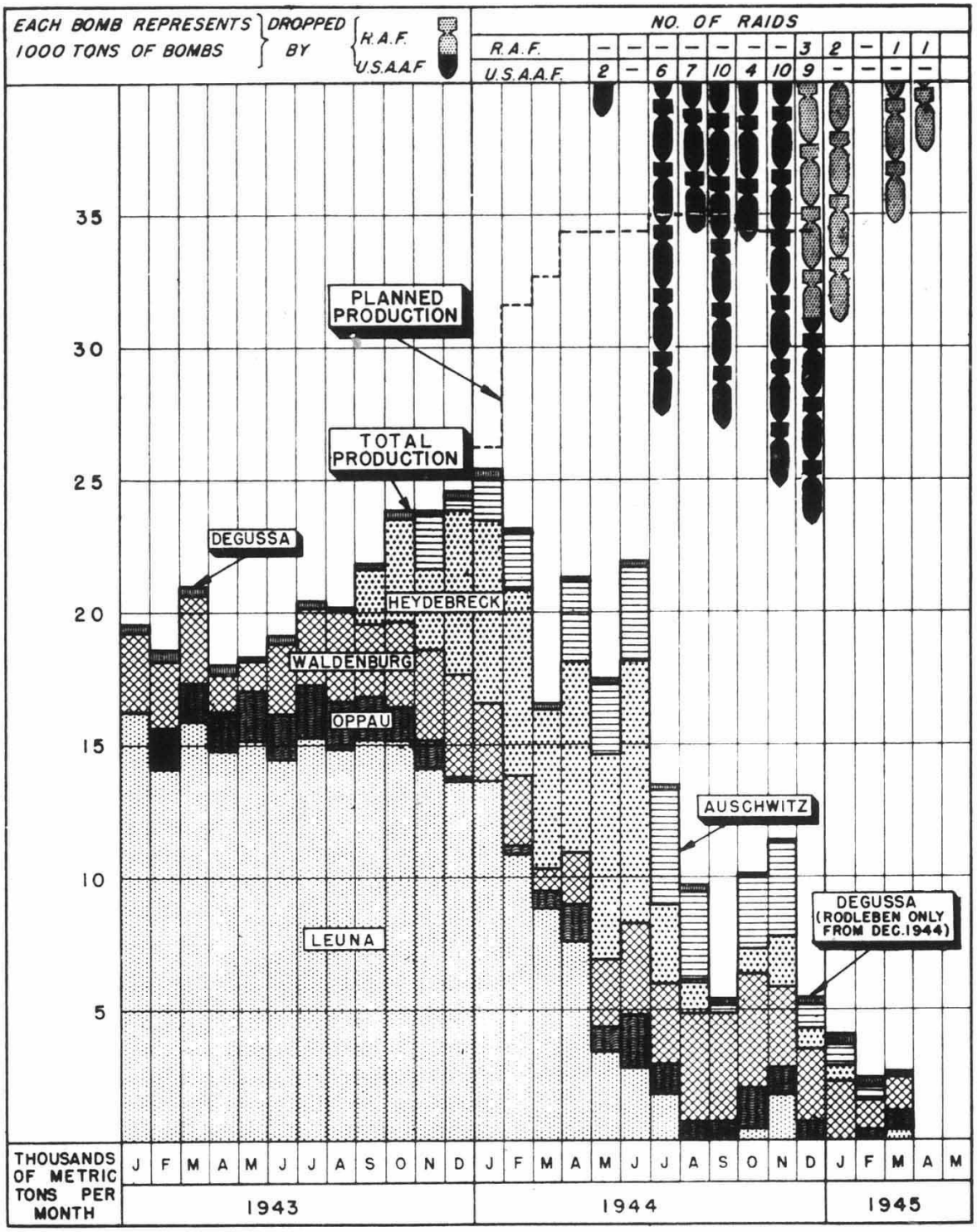


DATA ON ALLOCATIONS OTHER THAN THOSE SHOWN, ARE NOT AVAILABLE

Figure 10

METHANOL (PURE)

PRODUCTION BY I.G. AND DEGUSSA, PLANNED PRODUCTION AND BOMB TONNAGE DROPPED ON THESE FACILITIES



FIRST QUARTER OF 1945 IS ESTIMATED EXCEPT FOR OPPAU AND LEUNA
I.G. DATA FROM I.G. OFFICIALS, LUDWIGSHAFEN
DEGUSSA DATA FROM DEGUSSA OFFICIALS, FRANKFURT

Figure 11