

HISTORICAL EVALUATION AND RESEARCH ORGANIZATION

P. O. BOX 157, DUNN LORING, VIRGINIA 22027 560-6427

MEMORANDUM for Captain Denton West, USN; DNA

May 23, 1977

SUBJECT: Artillery Fire and Effect, US Ninth Army, Roer River Crossing,
February 23, 1945

1. This is an informal report in response to your request for information on the subject of the volume of artillery fire employed by the US Ninth Army in support of its crossing of the Roer River on February 23, 1945. Three principal secondary sources have been used as sources in the preparation of this report:

- a. Conquer: The Story of the Ninth Army, 1944-45 (Washington: Infantry Journal Press, 1947).
- b. Allen Mick, ed., With the 102nd Infantry Division through Germany (Washington: Infantry Journal Press, 1947).
- c. Charles B. MacDonald, The Last Offensive (Washington: GPO, 1974).

In order to obtain further details it would be necessary to devote a considerable amount of time to a research effort in the records of artillery battalions and other units in the Federal Records Center. Since it is believed that the following paragraphs, and the four enclosed charts, based on the three secondary sources, will provide most of the essentials which you mentioned, no attempt has been made to locate the additional materials. Our past research experience indicates, however, that much more detailed information is available, if the expenditure of time, effort, and funds is warranted.

2. Figure 1 is a compilation of the Ninth Army Artillery reports for February 22-23, 1945 (from 0600 on February 22 to 0600 on February 23). This report shows the number of artillery tubes that participated, including some tank destroyer and AAA guns that provided fire support, particularly during the pre-assault preparation. That preparation began at 0245 on February 23, and continued for 45 minutes; the assault began at 0330. The following points should be noted with respect to Figure 1:

- a. The number of rounds fired before 0245, February 23, is assumed to have been negligible; probably not over 2,000 rounds.
- b. It is assumed that between 0330 and 0600 on February 23 the artillery rate was the same as that of the rest of the day. The total expenditure between 0600 on February 23 and 0600 on February 24 of approximately 110,000 rounds, as shown on Figure 2, was probably made during roughly 10 hours of daylight (and an hour earlier and later) at an approximate rate of 9,200 rounds per hour. At this rate, in the two and a half hours between 0330 and 0600 about 23,000 rounds would have been fired.
- c. Based upon the two previous assumptions, it is assumed that about 45,000 rounds (approximately 65% of the total expenditure shown on Figure 1,

and about 1,000 rounds per minute) were fired during the preparation.

3. Since available data does not identify targets, the results of the artillery fire must be estimated. The data presented on Figure 3 provides a basis for calculating the theoretical effect of artillery fire during the total 24-hour period (0600 February 22-0600 February 23), and for the preparation. This chart repeats the information shown on Figure 1, for rounds expended by caliber, and converts these expenditures to the total areas that could theoretically have been covered, had there been no overlapping of effect. Thus, the total expenditure of 69,598 rounds for the 24-hour period theoretically could have covered an area of 56.18 million square yards. The area that theoretically could have been covered during the preparation would have been about 65% of that, or 36.52 million square yards. Assuming an approximately 50% overlap in the normal salvo or volley sheaf, the area that theoretically could have been covered during the preparation would have been 18.26 million square yards. It must be assumed, however, that each target was hit by five to ten volleys, thus the areas actually devastated during the preparation probably totalled about 2.43 million square yards.

4. The total front of the Army was 30 miles, although only a holding attack was made along approximately half of this distance. Had the volume of fire discussed above been spread equally on 36.52 million square yards on the far bank of the Roer River, the depth of the effective continuous coverage would have been about 690 yards; single volleys fired with a normal sheaf would have placed effective fire on the far bank of the river to a depth of 345 yards; and with an average of 7.5 volleys per target, the belt of devastation would have been about 50 yards deep. For the fifteen mile frontage of the main offensive effort, three-fourths of the preparation volume of fire would have covered theoretically to a depth of about 1,035 yards; single volleys with normal sheaf would have covered a belt about 515 yards deep; and with an average of 7.5 volleys per target, the devastated belt would have been about 70 yards deep. These figures are presented in tabular form below:

	Area Covered (1,000,000 yds ²)	Army Front 30 miles (Depth/yds)	Main Effort Front 15 miles (Depth/yds)
Theoretical maximum	36.52	690	1,035
Normal Sheaf 1 volley	18.26	345	520
Normal Sheaf 7-8 volleys	2.43	50	70

5. The sources available to us for this summary report do not provide very much information about the actual effectiveness of the preparation, except by implication. Although German resistance was encountered by the assaulting troops, it was not very effective. It was more than ten minutes after the preparation ended that German artillery was able to begin to respond to the assault. And total Ninth Army casualties on the day of the assault amounted to only 91 killed, 62 missing, and 913 wounded, out of a total of 11 divisions, or a total percent loss of less than 0.7%; which was only about 70% of the average daily U.S. division loss rate for active combat in the European Theater in World War II.

6. For a period of about fourteen hours intensity after 0330 on the 23rd, the intensity of fire was only about one-sixth of that during the 45-minute preparation. Nonetheless, during those fourteen hours a total volume of nearly 130,000 rounds was fired in support of the assaulting elements. This was a total volume about 2.83 times that of the preparation. Based upon the line of reasoning presented in paragraphs 3 and 4 above, and on the compilation in Figure 4, the Army's front could have been covered by effective belts of continuous artillery fire of varying intensities of devastation as shown below:

	Area Covered (1,000,000 yds ²)	Army Front 30 miles (Depth/yds)	Main Effort Front 15 miles (Depth/yds)
Theoretical maximum	103.35	1,950	2,930
Normal Sheaf 1 volley	51.68	975	1,465
Normal Sheaf 7-8 volleys	6.89	130	195

7. Please let me know if more information is required.

T.N. Dupuy
Executive Director

Figure 1

NINTH ARMY ARTILLERY AMMUNITION EXPENDITURE
0600 22 Feb - 0600 23 Feb 1945

Type	XIII Corps		XVI Corps		XIX Corps		34th FA Bn		Total Guns	Total Rounds
	Rounds	R/G	Rounds	R/G	Rounds	R/G	Rounds	R/G		
25 pounder	13,715	67.2	187	7.8	21,049	94.8			24	187
105mm How M2	645	53.8	1,497	10.4	604	50.2			570	36,261
4.5" Gun	6,488	71.4	412	17.2	7,042	65.2			48	1,661
155mm How	1,385	55.8	582	12.2	1,435	59.8			247	14,112
155mm Gun M1	692	57.6	380	15.8	443	36.9			73	3,200
155mm Gun M12	369	30.6			1,204	51.9			24	1,135
8" How									35	1,573
8" Gun									6	283
240mm How									18	371
Other Weapons in an Artillery Role										
3" Gun	627	17.4			4,476	24.9			216	5,103
75mm How	2,922	27.1			1,508	20.9			72	1,508
75mm Gun	1,342	12.9							108	2,922
90mm Gun AA									104	1,342
Totals	28,185		3,058		37,761		654	24	1,545	69,598

Figure 2

NINTH ARMY ARTILLERY AMMUNITION EXPENDITURE
0600 23 Feb - 0600 24 Feb 1945

Type	XIII Corps		XVI Corps		XIX Corps		34th FA Bn		Total Guns	Total Rounds
	Rounds	R/G	Rounds	R/G	Rounds	R/G	Rounds	R/G		
25 pounder	19,588	96.0	2,600	108.5	24				24	2,600
105mm How M2	340	28.4	9,016	63.2	142	30,056	135.2	222	568	58,660
4.5" Gun	8,142	84.8	789	32.8	24	847	70.6	12	48	1,976
155mm How	1,183	49.2	2,500	52.2	48	12,222	113.1	108	252	22,864
155mm Gun M1	723	56.2	704	29.4	24	2,572	107.2	24	72	4,459
155mm Gun M12	375	31.3				634	52.8	12	25	1,357
8" How						2,172	90.5	24	36	2,547
8" Gun									6	271
240mm How									18	479
Other Weapons in an Artillery Role										
3" Gun	869	24.1				7,633	42.4	180	216	8,502
75mm How						4,100	56.9	72	72	4,100
75mm Gun	873	16.1							54	873
76mm Gun	597	16.5	301	16.7	18				54	898
90mm Gun AA	278	3.8	102	3.1	32				104	380
Totals	32,968		16,012		309	60,236		668	1,549	109,966

Figure 3

NINTH ARMY ARTILLERY EFFECT
0600 22 Feb - 0600 23 Feb 1945

Type	XIII Corps	XVI Corps	XIX Corps	Army Arty	Total Rounds/Caliber	Effective Area Covered* (yds ²)	Theoretical Area by Caliber (yds ²)
25 pounder		187			187	450	84,150
105mm How M2	13,715	1,497	21,049		36,261	750	27,195,750
4.5" Gun	645	412	604		1,661	850	1,411,850
155mm How	6,488	582	7,042		14,112		
155mm Gun M1	1,385	380	1,435		3,200	1,080	19,922,760
155mm Gun M12	692		443		1,135		
8" How	369		1,204		1,573	1,600	2,969,600
8" Gun				283	283		
240mm How				371	371	2,500	927,500
3" Gun	627				5,103		
75mm How			4,476		1,508	300	2,859,900
75mm Gun	2,922		1,508		2,922		
90mm Gun AA	1,342				1,342	600	805,200
Total	28,125	3,058	37,761	654	69,598	807.2	56,176,710

* From FM6-40, 1950.

Figure 4

NINTH ARMY ARTILLERY EFFECT
0600 23 Feb - 0600 24 Feb 1945

Type	XIII Corps	XVI Corps	XIX Corps	Army Arty	Total Rounds/Caliber	Effective Area Covered (yds ²)	Theoretical Area by Caliber (yds ²)
25 pounder		2,600			2,600	450	1,170,000
105mm How M2	19,588	9,016	30,056		58,660	750	43,995,000
4.5" Gun	340	789	847		1,976	850	1,679,600
155mm How	8,142	2,500	12,222		22,864		
155mm Gun M1	1,183	704	2,572		4,459	1,080	30,974,400
155mm Gun M12	723		634		1,357		
8" How	375		2,172	271	2,547	1,600	4,508,800
8" Gun				479	271	2,500	1,197,500
240mm How					479		
3" Gun	869		7,633		8,502		
75mm How			4,100		4,100	300	4,311,900
75mm Gun	873				873		
76mm Gun	597	301			898		
90mm Gun AA	278	102			380	600	228,000
Total	32,968	16,012	60,236	750	109,966	800.8	88,065,200