

THE GENERAL BOARD

United States Forces, European Theater

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CHEMICAL MORTAR BATTALIONS

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MISSION: Prepare Report and Recommendations Covering the
Chemical Mortar Battalion, its Organization,
Employment and Equipment.

The General Board was established by General Orders 128, Headquarters European Theater of Operations, US Army, dated 17 June 1945, as amended by General Orders 182, dated 7 August 1945 and General Orders 312, dated 20 November 1945, Headquarters United States Forces, European Theater, to prepare a factual analysis of the strategy, tactics, and administration employed by the United States Forces in the European Theater.

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THE GENERAL BOARD
UNITED STATES FORCES, EUROPEAN THEATER

REPORT ON THE "CHEMICAL MORTAR BATTALIONS",
OF THE
EUROPEAN THEATER OF OPERATIONS

PART ONE

INTRODUCTION

CHAPTER I

PROCESS OF STUDY

SECTION I

COMMITTEE MEMBERSHIP

a. Permanent Members:

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SECTION II

TYPES AND SOURCES OF DOCUMENTS

1. Documents studied by the committee as a basis for this report are listed in the Bibliography at the end of the report.

SECTION III

SPECIAL CONFERENCES

2. Conferences were held with Brigadier General Hugh W. Rowan, Chief Chemical Officer, European Theater of Operations, and with specific individuals who were commanding officers of chemical mortar battalions during the European Theater Campaign and who are listed in this report as Principal Consultants.

PART TWO

REVIEW OF THE EMPLOYMENT OF CHEMICAL

MORTAR BATTALIONS, EUROPEAN THEATER CAMPAIGN

CHAPTER I

DISCUSSION

SECTION I

GENERAL

3. A chemical mortar battalion is organized under Tables of Organization and Equipment 3-25, 3-26, 3-27, dated 29 September 1944. The battalion consists of a headquarters and headquarters company, three weapons companies and an attached medical detachment.

a. Each weapons company consists of a company headquarters and three platoons, each platoon containing four mortar squads. The headquarters company consists of a company headquarters section, a battalion headquarters section and three ammunition sections.

4. The primary weapon is a crew-served muzzle loading rifled mortar, of 4.2-inch bore, and weight of approximately 300 pounds. It fires a shell weighing approximately 25 pounds which may be filled with gas, high explosive, white phosphorus or various other smoke producing compounds. The range is 600 to 4400 yards. The weapon's prime value lies in its accuracy and its rapidity of fire. Short bursts of 30 rounds per minute may be fired although the sustained rate of fire is five rounds per minute.

5. The 4.2 chemical mortar was developed by Chemical Warfare Service primarily for the purpose of delivering large quantities of gas on area targets in the minimum amount of time, by means of massed battalion fires.

a. As gas warfare failed to become a factor in this war a mission of close support for the infantry became in reality the primary mission for chemical mortar battalions. The development of a high explosive shell, subsequent to our entry into war, added to characteristics of great accuracy and intense volume of fire, placed the weapon in the highest brackets among close supporting weapons for infantry operations. This sudden shift found the Chemical Warfare Service and the 4.2 chemical mortar battalions inadequately prepared to fulfill their mission, both from a training and equipment standpoint and supply. (18).

b. The changes made since 1943 in the equipment, in tables of organization and in the employment of the weapon itself, are signs of failure during peace time to recognize the value of the 4.2 chemical mortar for close support of infantry operations and for reinforcing fires of the artillery. These changes came as a direct result of the altered mission of the mortar battalions in this theater from one of chemical to one of close support. Witness the change to a triangular

battalion - with the three ammunition sections in the headquarters company which makes the battalion more adaptable to serve with the triangular division. The recognition of the value of the 4.2 mortars came so late that it was impracticable to supply sufficient battalions to fill the needs of this theater. The majority of corps and army commanders who have expressed an opinion state that the ratio of mortar battalions to infantry divisions should have been one to one. (1, 4, 16 & 18).

c. The status of the mortar battalions is further complicated by the developments in gas warfare using airplanes as the medium for delivery. In non-persistent gas shoots (for which the 4.2 was considered best suited) general purpose bombs can deliver a higher concentration in such a short period of time that the old minimum of two minutes for completion of a non-persistent gas shoot has now been reduced to 30 seconds, according to teachings of the Chemical Warfare School. Furthermore the current state of development of rocket propulsion indicates that rockets will replace the 4.2 chemical mortar for delivery of toxic gas. In addition the degree of concentration desired has been raised which places further emphasis on the general purpose bomb as a means of delivering gas. These developments combined with the recognized importance of the 4.2 mortar in their new role warrants reconsideration of the mortar as a primary chemical weapon.

SECTION II

OPERATIONS

6. Two chemical mortar battalions landed on D-Day with advance infantry units and were in action upon their arrival on shore. (3, 13 & 17). Two other battalions landed D plus 25. Three battalions were used in connection with the amphibious operation of the 6 Army Group in Southern France. It was during this operation that, insofar as is known, the single instance of the use of chemical mortar troops with an airborne division occurred. One company of the 2 Chemical Mortar Battalion and one company of the 83 Chemical Mortar Battalion respectively, participated in this operation. Details are not known since the units concerned were under the command of another theater at the time. It is known, however, that the operation was considered a success but could have been improved if specialized equipment had been available. (27). These battalions were in almost continuous action until VE-Day. Five other battalions were received in the European Theater early in March 1945 and were committed during the last weeks of the campaign. Upon termination of hostilities, these five battalions were withdrawn for redeployment to the Pacific Theater, and details of their operations are not known.

7. As Army troops, chemical mortar battalions were normally attached to Corps which attached battalions and companies to divisions and in turn were placed under the control of the supported regiments or battalions as the need arose. However, one mortar battalion operating with XIX Corps was attached to the artillery of the unit making the main effort or to the corps artillery and its fire was controlled by the artillery fire direction center. (12). This method was also used by other headquarters in defensive situations (8) but the

general consensus of opinion is that if the mortars primary mission is to be close support of the infantry, this may best be effected by placing the 4.2 mortar units under the control of the supported units. (1, 4, 10 & 27).

8. Despite the fact that the mortar platoon is the basic fire unit, mortar units normally should be used in company strength (1, 4 & 10) in order to make use of the company fire direction center and to permit efficient administration based on the company as the basic administrative unit.

9. The shortage of 4.2 mortar units forced commanders to detach platoons and even squads for special missions. This created many unusual administrative and supply problems and decreased the overall efficiency of the unit. These problems and hardships were generally accentuated by the lack of familiarity of supported unit commanders with the capabilities and limitations of the 4.2 mortar and the battalion and company organization which served these weapons. (2, 10 & 21).

10. The employment of the chemical mortar battalions was discussed at length with the Chief Chemical Warfare Officer of the European Theater. His views are best expressed in his own words - "One of the most difficult tasks confronting the Theater Chemical Officer during active operations was the constant effort to insure that Chemical Mortar Battalions were tactically employed in such a manner that their capabilities were fully utilized. Until shortly prior to VE-Day there was no approved doctrine for the tactical employment of these units. FM 3-20 covering this subject has never been published by the War Department. A tentative and condensed version of this Field Manual was published as War Department Training Circular Number 8, dated 24 February 1945, but the first copies of this circular did not reach this Theater until April 1945 and were therefore received too late to be of any real assistance in the war in Europe. Owing to the lack of any standard doctrine for the employment of Chemical Mortar Battalions, Corps and Division Commanders used them in accordance with their own individual ideas which varied from the sound to the highly unsound and wasteful. It fell to the lot of the Theater Chemical Officer to attempt to correct these deficiencies and standardize procedure, but the sole available method to accomplish this was by personal persuasion of individual commanders, owing to the existing policy in the Theater whereby Higher Headquarters were always extremely reluctant to issue peremptory orders on tactical matters to subordinate commanders."

11. The shortage of mortar units also was responsible for battalions being left in the line for excessive periods of time while the divisions they were supporting were rotated. (6, 9, 17 & 18). This created supply problems, and forced battalion commanders to alter their tables of organization, usually by reducing the number of effective weapons per company and rotating the men to battalion rest camps.

SECTION III

TRAINING

12. Mortar battalion commanders and division commanders

are almost unanimous in their criticism of the lack of combined training the mortar units and the infantry divisions received. (2, 10, 21, 22 & 23).

13. The absence of an approved doctrine for the tactical employment of chemical mortar battalions, adversely effected the training of these units. (27 & 28). A few battalions participated in maneuvers held in the Zone of the Interior, prior to embarkation. The majority had at best only two weeks combined exercises with a division, but as no approved doctrine was published, this combined training fell far short of the objective that should have been accomplished. As a result, battalions arrived in this theater inadequately trained and without a clear understanding of their general mission, (35). Based on combat experiences in the European Theater, and that gained in the Mediterranean Theater, which is referred to because of its important bearing on this analysis, there are two general tactical missions of 4.2 mortar battalions; one, primary; the other, secondary.

14. The primary mission definitely is close support for infantry. The employment of high explosive and white phosphorus ammunition together with the outstanding characteristics of tremendous fire power, high capacity of shell and adequate, though limited range, make it an ideal weapon for this purpose. Results of operations using the 4.2 mortar in this capacity have clearly demonstrated its superiority in this field. In the execution of its secondary mission, the 4.2 mortar is rightly employed as a substitution for field artillery. Outstanding among the examples of the secondary mission are its use in amphibious operations. The ability of 4.2 mortar battalions to land on beaches with assault infantry units, immediately emplace their weapons and enter into operations several hours before the less adaptable guns of the field artillery, assure early application of heavy fires on hostile resistance. Also in mountainous or rugged terrain, where the mobility of field artillery is impaired and where targets are well defiladed, the 4.2 mortar with its high trajectory well serves as a substitute for the former weapon. (27).

15. In order to be proficient in either of the general missions it is evident that training of the 4.2 mortar battalions must be based on the fact that they are best employed in close support of infantry, but will doubtless also be employed to substitute for or reinforce the fires of the field artillery when the occasion demands. No objection entered to employing artillery technique in the delivery of fire, for training of this nature will not deter from the primary mission of closely supporting infantry. On the other hand it should enhance the value of the mortar fires when substituting for or reinforcing artillery fires. It is of paramount importance however that sound standardized training doctrine, based on the fact that the 4.2 mortars are most efficiently employed in close support of infantry, be published.

16. Many problems would have been eliminated had there been sufficient battalions to permit more or less permanent attachment of divisions in the manner of tank destroyer and antiaircraft artillery battalions. Provided the ratio of one mortar battalion to one infantry division is accepted, it is apparent that training, supply and administration would be simplified by making the mortar battalions organic to infantry divisions. (2).

SECTION IV

ADMINISTRATION

17. The basic administrative unit of a mortar battalion is the company, but many corps and division commanders failed to recognize this fact or at least failed to appreciate the problems of a platoon or squad when divorced from its parent unit and placed in a different supply and administrative channel. (30, 32 & 38).

18. Morning reports - replacements - mail and general routine administration break down completely when the headquarters section of a company finds its platoons attached to units of different divisions, sometimes not under the same corps headquarters. Morale of the unit suffers as platoons are not administratively self-sufficient. This was further accentuated in this theater when the battalions were forced to remain in the line for periods of two to three months without relief. (24).

19. As in the case of operations - the administration problems of separate units such as the mortar battalions would disappear at once if a permanent attachment were made or the battalions were made organic to the infantry division.

20. Replacements of personnel in separate 4.2 mortar battalions depended primarily upon the ingenuity of the battalion personnel officer or his commanding officer. Both officer and enlisted replacements were generally unsatisfactorily trained except in a few instances where infantry trained men, familiar with their own mortar operations, were sent in as replacements to a mortar battalion. (9, 13, 17 & 32).

SECTION V

SUPPLY

21. Fortunate was the battalion which was attached to the same unit for a sufficient length of time to complete a requisition for class II or IV items. Major L. R. Kuiper, Chemical Warfare Service instructor at the Command and General Staff School, well named these units as "Orphans of Army, Corps and Divisions". (26).

22. Again the shortage of this type unit in proportion to other units thus necessitating short term attachments, magnified the supply problem and required departures from normal procedures. (17).

23. Class I and III supplies were handled in normal manner fairly satisfactory. The method of handling Class V supplies in this theater varied considerably depending on the standard operating procedure of the Army headquarters involved. Although the Army Chemical Officer is charged with the responsibility of distributing chemical munitions, the wide dispersion of battalions and their subordinate units and the inadequate chemical supply troops often forced an arrangement with the Army Ordnance Officer to permit ordnance army

supply points to handle 4.2 shells. This method apparently operated as efficiently as the normal procedure of establishing chemical army supply points. The fact that ordnance army supply points were more numerous often worked to the advantage of the battalion ammunition sections which although considered adequate, were usually pressed to maintain a battalion dump.

24. Although various solutions were worked out, and all functioned satisfactorily in a given situation, it is imperative that the ground force commander realize the problems facing mortar companies and battalions where artillery ton-nages must be transported to small arms front line positions.

25. As implied in the opening paragraph of this section, Class II and IV supply procedure has not been satisfactory in most instances. Again the shortage of mortar units and the short term attachments of these units created an unusual situation which required unorthodox methods of solution.

SECTION VI

EQUIPMENT

26. Two serious technical deficiencies were observed during operations employing the 4.2 inch chemical mortar. These are:

- a. Structural weakness in the mortar.
- b. Faulty ammunition.

In one battalion, during one month of combat, 51 standards, 35 barrels and 48 baseplates were rendered unserviceable which necessitated repairs or replacement. (5). In another battalion, during a period of approximately two months, 187 elevating screws were so badly bent that replacement or repair was necessary. (9). Damage to these parts was the result of normal combat use and not through enemy action, and was observed in all 4.2 units. (17).

27. The structural weakness existing in the weapon is the direct result of a policy on the part of the Chemical Warfare Service to limit the weight of the weapon. This policy is based on the fallacy that the 4.2 chemical mortar should be adaptable to the hand-carry. In this theater, except for very short distances, modern transportation has obviated the necessity for transporting the weapon by hand. Many reports, additional to those cited early in this paragraph, confirm the contention that there is decided structural weakness in the mortar, which must be eliminated, even at the expense of increasing the weight. (33 to 41 incl.).

28. The second major fault observed during the European operation was revealed during the winter of 1944 - 45. Defective ammunition caused muzzle and bore bursts in such frequency that all 4.2 inch shells on the continent had to be impounded pending corrective action. The demand for the use of the weapon in action was so great, however, as to warrant firing with a lanyard, but this method defeated the most

desirable characteristic - rapidly producing a great volume of fire in the minimum of time. In addition the premature bursts were injurious to personnel of the mortar crews which justly resulted in an attitude of reluctance among the mortar crews to serve their weapons. (23, 35 & 39).

29. The maximum effective range of 4000 yards and the narrow traverse of 250 mils have proven too limited to permit the highest degree of efficiency in combat. A great majority of personnel, experienced in combat, have proposed an increase in the maximum effective range up to 6000 or 6500 yards, and a broadened traverse to approximately 800 mils. Such increases would obviate the necessity of frequent changes in mortar positions, and greatly increase the flexibility of mortar fire. (5, 21 & 36).

30. As far as can be determined there was but one really thorough test of a 4.2 mortar battalion operating with an armored division. The conclusion of the armored division chemical officer, based on this action was that chemical mortar troops can be profitably employed with armored divisions only with considerable difficulty with their existing equipment. That these difficulties can be largely removed by providing special equipment for the 4.2 mortar battalions is a further conclusion. No information of value has been located which was referred to 4.2 mortar support to an airborne division. (26). This field of action should not be ignored, and investigation would reveal the advantages and disadvantages of including a 4.2 mortar battalion as an organic part of both armored and airborne divisions, as well as infantry divisions.

PART THREE

COMMITTEE REPORT

CHAPTER I

CONCLUSIONS

31. It is concluded that:

a. The primary mission of the 4.2 mortar battalion has changed from chemical operations to close support of the infantry with a secondary mission of substituting for or reinforcing artillery.

b. Insufficient mortar battalions were available for use in this theater,

c. The ratio of 4.2 mortar battalions to division should be one to one.

d. The 4.2 mortar battalions were inadequately trained in the Zone of the Interior.

e. There was an unstandardized, unco-ordinated and often unsatisfactory tactical employment of chemical mortar battalions in this theater.

f. Personnel replacements for 4.2 mortar battalions were in insufficient number and usually were inadequately trained.

g. The mortar units were most efficiently used when control by the mortar company was maintained.

h. The weapons companies of mortar battalions performed their primary mission most efficiently when attached to the supported infantry.

i. Accepted artillery fire control methods are adaptable for mortar company fire direction centers.

j. Administration and supply of 4.2 battalions was inefficient due to unorthodox attachments and the use of the weapons in too small units.

k. The 4.2 mortar needs additional improvements in range and traverse to obtain maximum efficiency.

l. Insufficient evidence is available to warrant a conclusion as to the value of mortar battalions operating in conjunction with armored or airborne divisions.

CHAPTER II

RECOMMENDATIONS

32. It is recommended that:

a. The 4.2 mortar battalions be provided for infantry divisions, at the ratio of one to one.

b. Tactics and doctrines regarding the use of 4.2 mortars be prepared and published.

c. The training doctrine be based on the premise that the primary mission of 4.2 mortars is close support of infantry, with a secondary mission of reinforcing or substituting for field artillery, in special operations.

d. The word chemical be eliminated from the type name of these battalions.

e. A study be made to determine feasibility of using mortar battalions with airborne and armored divisions.

f. Steps be taken to increase the range and traverse of the 4.2 mortar.

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