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SUMMARY OF MAJOR EVENTS
and
PROBLEMS

United States Army Chemical Corps (U)

FISCAL YEAR 1960

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(U) Something of an innovation in the area of R&D advanced planning techniques appeared during FY 1960 in the form of joint R&D - user seminars, which consisted of map exercises. The first of these, Project SCORPION, was carried out in conjunction with the Marine Corps in May, 1960, and concentrated on elevated line source dissemination (i.e., airborne spraying) of selected agents in simulated tactical situations.¹⁷²

Fourteenth Tripartite Conference

(C) The Tripartite conferees on toxicological warfare met for their fourteenth annual session during the period 14 - 26 September 1959, at Army Chemical Center. The three delegations, representing the United Kingdom, Canada, and the United States respectively, organized themselves jointly into eight subdivisions, corresponding to the eight basic aspects of CBR on the agenda. Among the recommendations approved by the conference were: (a) an increased effort in the area of genetic research as an aid in the development of new or improved BW agents, (b) high priority research and development for BW and CW alarm systems, (c) emphasis on incapacitating CW agents, (d) combat development exercises to determine problems of living and fighting in a toxic environment, (e) establishment of uniform BW aerosol assessment procedures by a Tripartite working group, (f) consideration by CW/BW research workers of the problem of the effect of radiation exposure on subsequent CW/BW

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Interv, Hist Off with Mr Howard M. Trussell, Adv Pl Div, Hq, RDCOM, 28 Oct 60. Project SCORPION is more fully discussed in pp. 54 - 56 above.

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attack, (g) study of fallout prediction methods through the production of particles comparable to fallout for use in experiments.¹⁷³

Dispersal Systems

(C) The major accomplishment of the year in this realm was the standardization early in the fourth quarter of the T-238 toxic rocket as the Rocket, Gas, 115-mm, M55, authorized to carry either GB or VX fillings. The rocket, designed to serve as an optimum area ground dissemination source, had been under development by Ordnance, in conjunction with the Chemical Corps, since the Korean War. The weapon consists of a fin-stabilized solid fuel rocket 78 inches long, the forward third of which constitutes the warhead, carrying approximately 11 pounds of agent. It is fired from a multi-tube launcher capable of handling 45 rounds simultaneously.¹⁷⁴ During the early months of FY 1960 the rocket successfully passed the engineering test phase, but the user tests, carried out by the Field Artillery Board, resulted in two wild rounds and a report recommending corrective changes in both rocket and launcher. The modifications were accomplished in time for check testing in March, 1960, following which the Artillery Board declared itself ready to recommend standardization. With the completion of this action in April, the Chemical Corps became possessed for the first time of a standard munition with a VX

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Final Report, 14th Tripartite Conference on Toxicological Warfare, pp. 23 - 54.

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CCTC Item 3704, Classification of Rocket, Gas, 115-mm., M55 (T238) as a Standard-A Type..., 4 Apr 60.

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capability.¹⁷⁵

(C) A second VX munition was accepted for standardization by the Chemical Corps Technical Committee in April, 1960: the E5 chemical land mine. This item, conforming in general design to the standard anti-tank mine, was designed to replace the mustard mine originally developed before World War II. It is a thin steel container with fuze wells, bursters, and a capacity for 11½ pounds of VX. In tests conducted earlier in the year the mine functioned satisfactorily in terms of the prescribed military characteristics, but the Armor Board, which carried out the user testing, indicated concern over possible shortcomings if the weapon were used as an anti-personnel munition, and recommended re-evaluation of employment. The Chemical Corps view was that since the mine admittedly met the characteristics originally prescribed by CONARC, it ought to be accepted as a standard item. This policy was adopted by the Army when type classification of the item as Mine, Gas, Persistent VX, 2-gallon, M23 (E5) was approved on 25 May 1960. However, the Corps of Engineers entered a demurrer based on the fact that it was currently reconsidering the entire field of mine warfare doctrine. In consequence, it was impossible to say, as of the close of the fiscal year, what role the newly standardized M23 would play in the arsenal of chemical weapons.¹⁷⁶

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(1) Ibid. (2) Quart R&A Presentation, RDCOM, to CCm10, 1st Qtr, FY 60.

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(1) CCTC Item 3705, Classification of Mine, Gas, Persistent VX, 2-gallon, M23 (E5) as a Standard-A Type, 8 Apr 60. (2) CCTC Item 3710, same sub, 5 May 60 w/1st Ind, 25 May 60. (3) Interv, Hist Off with Mr Nicholas S. Capasso, Dev Div, RDCOM, 4 Nov 60.

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(C) A third major type classification action in the area of dispersal systems was that which brought a toxic warhead for the Honest John missile into the Army supply system. The warhead was the E19R1, the outgrowth of over seven years of work on the problem of utilizing large-caliber mid-range rockets to carry toxic agents. The method adopted was the inclusion of a large number of small self-dispersing spherical bomblets within a warhead shell compatible with the basic rocket design. The E19R1 utilizes as its bomblet the E13OR1, a ribbed steel 4.5-inch sphere containing about 1.1 pounds of GB as its fill and equipped to arm itself for bursting by its own rotation as it falls. When loaded, the E19R1 contains 356 of these spheres.

(C) Engineering and user test reports, available near the beginning of the fiscal year, indicated that the warhead was able to contaminate effectively a target area 500 meters in radius, not including downwind areas, when fired under standard circumstances. Use of the E130-type bomblet in the warhead for VX disseminations, though originally projected for development, was ultimately regarded by the Chemical Corps as unsatisfactory from the point of view of fully exploiting VX capabilities. Type classification action, completed on 14 April 1960, designated the munition as a standard-B type Warhead, 762-mm. Rocket, Gas, Non-persistent, GB, M79 (E19R1). An E19R2 warhead, utilizing the E13OR2 aluminum bomblet, was not ready for type classification as the year ended.¹⁷⁷

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CCTC Item 3694, Classification of Warhead, 762-mm. Rocket, Gas, Non-persistent GB, M79 (E19R1) as a Standard-B Type, 10 Feb 60.

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(C) The E13OR2 bomblet turned out to be the crucial difficulty in gaining type classification status for both the improved Honest John warhead and the toxic warhead being developed for the Little John rocket. It proved to need additional work in the area of fuze function; moreover, a tendency toward buildup of unacceptable pressures when the sphere was loaded made its appearance. While these problems remained to be ironed out, type classification of the two warheads had to be deferred.¹⁷⁸

(C) Perhaps the most promising new development in the field of dispersal systems during FY 1960 was the commencement of a program to utilize Army combat surveillance drones as line source agent disseminators. Drones available for planning and development estimates would provide the Chemical Corps with spray tank carriers capable of speeds from 200 to over 500 knots, and with payload capacities varying from 200 up to perhaps 1,600 pounds of BW or CW agent. The prospect of more efficient line source dissemination was particularly interesting to the Chemical Corps because that method, though more dependent on weather conditions than point source dispersal, provides better coverage. Moreover, the prospect of reduction in the size of future Army missiles makes these point source vehicles less promising for the purposes of CBR warfare.¹⁷⁹

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(1) Quart Presentations, RDCOM, to CCm1O, FY 60. (2) Capasso interv, 4 Nov 60.

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(1) Interv, Hist Off with Mr J. Rex Pimlott, Dev Div, RDCOM, 4 Nov 60. (2) Quart Presentation, RDCOM, to CCm1O, 2d Qtr, FY 60.



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product to a particle diameter of about 5.5 microns through a two-stage mil-
ling operation. The stabilizer used is a protective suspension containing
skim milk, sucrose, and thiourea, which serves as a coating for the organisms
throughout the process. A gram of the packaged product contains about
 14.7×10^9 viable cells and has a three year storage stability when stored in
a dry nitrogen atmosphere at -18°C . From the logistical point of view espec-
ially, successful completion of this development of the first standard dry
live agent constitutes a major breakthrough in BW. Type classification of the
dry agent was completed on 29 September 1959.¹⁸⁹

(C) Work on lethal CW agents centered largely on the V agents. As a
byproduct of study of the behavior of V agents in solution a new highly toxic
compound was identified, a product of the hydrolysis of VX in neutral or
slightly alkaline solutions. The new item, designated EA 2192, reacts irrever-
sibly with cholinesterase and has an LD50 comparable to VX, but it requires
additives before it will penetrate the skin. Further study of the compound
was scheduled.¹⁹⁰ Research on certain highly toxic substances, notably the
carbamates (typified by EA 1464) and the natural toxins found in clam siphons
and the Japanese puffer fish, continued through the year. Additional quanti-
ties of the latter were isolated, and a new determination was made for the

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(1) CCTC Item 3632, Classification of Dry Pasteurella Tularensis ...
as a Standard-A Type BW Antipersonnel Agent (S), 4 Sep 59. (2) Quart Pre-
sentation, RDCOM, to Ch, R&D, DA, 3d Qtr, FY 60.

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Quart Hist Rpts, CWL, Jan - Mar 60, Apr - Jun 60.

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FY 1960.²⁵³

(C) M55 (T238) Rocket.²⁵⁴ The 115mm. M55 (T238) rocket, gas, persistent, VX, and non-persistent gas, GB, were standardized in the third quarter of FY 1960. The Department of Defense immediately released funds for procurement of components and the Chemical Corps let contracts to provide components for 40,000 GB-filled rockets and 20,000 VX-filled rockets. On the first day of FY 1961, the Department of Defense approved a production base project to construct Chemical Corps filling and assembly facilities. The Chemical Corps was several steps nearer to the attainment of the first significant ground capability since the development of the 4.2" chemical mortar.²⁵⁵

(C) Other Toxic Munitions - Forecasts. The M23 (E5) VX chemical land mine was type classified in the final quarter of FY 1960. This mine was developed to meet Army requirements. The FY 1960 production base project to provide filling facilities for this mine was approved on the first day of FY 1961. Just at the end of the year, the Corps of Engineers was studying the whole field of mine warfare, and it appeared possible that the Corps of Engineers conclusion would be that mines are not adaptable to modern tactical situations. Should this conclusion be reached, higher authority would be called

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Progress Rpt file.

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Summary of Major Events and Problems, FY 59, pp. 154 - 55.

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(1) Interv, Hist Off with Mr Paul Bihlman, Log Div, OCCm10, 28 Oct 60.
(2) Readiness Rpts, 1 Aug 59, pp. 65 - 66, 97 - 98; 1 Nov 59, pp. 65 - 66, 97 - 98; 1 Feb 60, pp. 3 - 4, 15 - 16; 1 May 60, pp. 3 - 4, 15 - 16; 1 Aug 60, pp. 3 - 4, 15 - 16. (3) Quart Hist Rpts, MATCOM FY 60.

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upon to review Chemical Corps plans for production of the M23 mine. From the Chemical Corps point of view, ample justification exists for proceeding with procurement and production.²⁵⁶ Other toxic munitions in prospect were warheads for the Honest John, Little John, and Sergeant missiles, plus eight inch and 155 mm howitzer shells. The missile warheads were still in the engineering design phase of development at the end of FY 1960, while the shells were nearing type classification. Preproduction work on the shells was in progress during FY 1960 with procurement and supply scheduled for FY 1962.²⁵⁷

(C) Riot Control Agents and Munitions.²⁵⁸ The Chemical Corps' hasty but highly effective action in FY 1959 to provide emergency production of the new riot control agent, CS, continued in FY 1960. The plan at the beginning of the year was to modernize completely the converted CN production facility at Edgewood Arsenal for the manufacture of CS at a cost of \$495,000. Then, in August 1959, new emergency requirements for agent were placed which made it impossible to rebuild the Edgewood facility since production would be underway. As a result, an emergency plant modification project for \$120,000 was set up and approved. Plant modification was complete on 15 January 1960, and urgent requirements for agent were met by 1 February. The complete modernization project was at that time revived, but held in abeyance since the Commanding General,

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(1) Readiness Rpt, 1 Aug 60, pp. 13 - 14. (2) Mullen interv, 31 Oct 60.

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(1) Readiness Rpt, 1 Aug 60, pp. 5 - 12, 19 - 28. (2) Quart Hist Rpts, MATCOM, FY 60. (3) Montanary interv, 16 Nov 60.

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Summary of Major Events and Problems, FY 59, pp. 147 - 51.

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