

Chemical Corps Research and Development Command  
U. S. ARMY CHEMICAL WARFARE LABORATORIES  
Army Chemical Center, Maryland

UNCLASSIFIED

U. S. ARMY CHEMICAL WARFARE LABORATORIES QUARTERLY HISTORICAL REPORT  
1 April to 30 June 1957 (U)

August 1957

Reports Control Symbol  
CMLHO-194

Prepared by

Robert T. Brown, Historian

This document contains information affecting the national defense of the United States within the meaning of the Espionage Laws, Title 18 U.S.C. sections 793 and 794, as amended. The transmission or the revelation of its contents in any manner to any unauthorized person is prohibited by law.

Reproduction of this document in whole or in part is prohibited except with permission of the issuing office.

Recommending Approval:

APPROVED:

*Paul D. Olejar*  
PAUL D. OLEJAR  
Chief, Technical Information Division

*J. P. Mitchell*  
J. P. MITCHELL  
Director of Technical Services

221  
DOWNGRADED AT 3 YEAR INTERVALS;  
DECLASSIFIED AFTER 12 YEARS.  
DOD DIR 5200.10

*A. C. Hamilton*  
A. C. HAMILTON  
Lt Colonel, CMIC  
Deputy Commander

UNCLASSIFIED

Command Historical Office, CBDCOM  
Edgewood Arsenal, MD  
Edgewood Room; Cabinet 35 ; Drawer # 5

**UNCLASSIFIED**

TABLE OF CONTENTS

	<u>Page</u>
I. ADMINISTRATION.....	1
A. Changes in Mission and Responsibilities.....	1
B. Acquisition and/or Disposal of Physical Facilities.....	1
C. Major Organizational Revisions.....	1
D. Developments in Administrative Procedures.....	2
II. FISCAL.....	3
III. PERSONNEL.....	4
A. Changes in Key Personnel.....	4
B. Personnel Strength.....	6
IV. PLANS.....	10
A. Plans for Permanent Peacetime Establishment.....	10
B. Mobilization Plans.....	10
C. Current Planning.....	10
V. OPERATIONS.....	12
A. Office of the Commanding Officer.....	12
B. Directorate of Development.....	12
C. Directorate of Medical Research.....	15
D. Directorate of Research.....	21
E. Directorate of Technical Services.....	24
VI. GENERAL.....	25
A. Unusual Activities.....	25
B. Inspections.....	27

APPENDIXES

- A - Organization Chart
- B - Summary of Technical Reports and Papers

**UNCLASSIFIED**

---

Command Historical Office, CBDCOM  
Edgewood Arsenal, MD  
Edgewood Room; Cabinet 35 ; Drawer #5

UNCLASSIFIED

III. (U) PERSONNEL.

A. Changes in Key Personnel.

1. Office of the Commanding Officer.

a. On 30 April 1957 Mr. Charles A. Butler was appointed Acting Executive Assistant to Deputy Commander for Scientific Activities for the period 29 April through 26 July 1957 vice Mr. John C. Smith, relieved.

b. Mr. Dave A. Rucker was appointed Acting Chief, Security Office, effective 21 June 1957, vice Maj Theodore E. Demasse, CmlC, relieved.

2. Directorate of Development.

a. On 25 April 1957 Mr. Luther M. Hardin was appointed Chief, Military Evaluation Branch, Radiological Division, effective 11 January 1957.

b. Mr. Richard W. Harris was appointed Assistant for Technical Coordination, effective 13 May 1957, vice Mr. Donald F. Ormerod, relieved.

c. Mr. William J. Weber was appointed Chief, Ground Munitions Branch, Munitions Division, on 28 May 1957, vice Maj Harry A. Treleven, CmlC, relieved.

d. Capt William S. Vargovick, CmlC, was appointed Assistant Chief, Ground Munitions Branch, Munitions Development Division, effective 28 May 1957, vice Mr. William J. Weber, relieved.

e. Mr. Luther M. Hardin was designated Chief, Technical Evaluation Branch, Radiological Division, on 28 May 1957.

f. Mr. William H. Ichniowski was appointed Chief, Administrative Office, effective 17 June 1957, vice Mr. Edgar M. Koller, relieved.

3. Directorate of Medical Research.

a. Dr. Van M. Sim was appointed Acting Chief, Clinical Investigation Branch, Clinical Research Division, in addition to his other duties effective 1 April 1957, vice Dr. Gustave Freeman, relieved.

b. Dr. Earl Davy was appointed Chief, Psychology and Human Engineering Branch, Clinical Research Division, effective 1 April 1957, vice Dr. Leonard S. Rubin, relieved.

c. Dr. John F. O'Leary was appointed Assistant Chief, Pharmacology Branch, Physiology Division, effective 8 April 1957.

Command Historical Office, CBDCOM  
Edgewood Arsenal, MD  
Edgewood Room; Cabinet 35; Drawer # 5

6. (U) Papers for Publication and/or Presentation.

The following papers were cleared during the report period for publication and/or presentation:

<u>Author(s)</u>	<u>Title</u>	<u>Proposed Use</u>
Allan L. West	Respiratory Protective Equipment Developments by the U. S. Army Chemical Corps	Presentation: Mtg of Am. Indust. Hygiene Assoc. and the Am. Conf. Governmental Indust. Hygienists, St. Louis, Missouri, 24 Apr 57 Publication: Industrial Hygiene Assoc. Quarterly or A.M.A. Arch. Indust. Health
David N. Kramer & Robert M. Gamson	A Colorimetric Method for the Determination of Acetylcholinesterase Activity	Publication: Anal. Chem.
Gerald J. Fleming	A Comparison of Performance Standards and Tests Specified by Bureau of Mines Schedule 14F and by the Chemical Corps for the M9A1 Mask	Publication: Am. Indust. Hygiene Assoc. Quarterly
Nathan Klein & David N. Kramer	Studies in Chemical Dosimetry I--The Water Trichloroethylene-Phenol Red System	Publication: J. Radiation Research

C. (C) Directorate of Medical Research.

1. (C) Wound Ballistic Studies.

In the course of wound ballistic studies supported by the Ordnance Corps and the Surgeon General, the wound capabilities were examined for a series of Salvo bullets at real ranges of 140 and 500 yards. Goats were wounded with the following Salvo bullets: 7.62-mm. NATO ball (.30-cal. T21 ball), .30-cal. duplex round, .30-cal. triplex round, .22-cal. high-velocity lead-core (Sierra) ball, .22-cal. carbine ball, and .22-cal. duplex round. At 140-yard range the wounds produced by the Salvo bullets were similar in magnitude, the smaller bullets making up the in tumbling abilities what they lacked in impact energies. At 500-yard real range more tissue destruction was caused by the .22-cal. Sierra ball and the 7.62-mm. NATO ball than by the other rounds. "Stopping power" was related to vital areas struck by the bullets. The cause of "stopping power" is physiological, not mechanical.

2. (C) Technical Reports.

The following technical reports were distributed during the report period:

Command Historical Office, CBDCOM  
Edgewood Arsenal, MD  
Edgewood Room; Cabinet 35 ; Drawer #5

UNCLASSIFIED

<u>Report No.</u>	<u>Author(s)</u>	<u>Title</u>	<u>Date</u>
CWLR 2097	R. Ingram, Jr.	The Effect of Ballistically Produced Muscular Damage on the Electrolyte Balance in Plasma and Muscle. (U)	20 Mar 57
CWLR 2099	Elmer G. Worthley Victor R. Clare Jules M. Merkler	Wound Ballistics of the 2.1 Grain Steel Cube Preformed Fragment (U)	20 May 57
CWLR 2100	Arthur L. Humphries Jr.	Evaluation of the Disabling Potential of the 2.1 Grain Steel Cube Preformed Fragment (C)	25 Mar 57
CWLR 2104	Earl Davy	Some Human Engineering Aspects of the Portable Flame Thrower Gun (U)	1 Apr 57
CWLR 2107	L. S. Rubin F. Rosenberg A. Karasik	Manual Dexterity of the Gloved and Bare Hand As a Function of Ambient Temperature and Duration of Exposure (U)	20 Mar 57
CWLR 2109	Francis Marzulli Joseph S. Wiles Paul E. Burnett	Signs of Poisoning in Rabbits Following Intravenous Injection and Skin Application of VE (EA 1517) (U)	20 Mar 57
CWLR 2113	Richard Horton Lillian W. Conn Joseph S. Wiles	Preliminary Toxicological Studies of EA 1664 (U)	12 Apr 57
CWLR 2114	Charles Wilber	Chromatic Responses of Fundulus to EA 1729 (U)	12 Apr 57
CWLR 2116	David H. Rosenblatt Frederick F. Caserio, Jr.	Distribution of EA 1508 Between Basic Aqueous Buffer and Organic Solvents (U)	15 Apr 57
CWLR 2120	R. D. Appleman J. Delouche C. Wilber	The Effect of EA 1729 on Behavior of Nubian Goats (U)	6 May 57
CWLR 2121	Francis N. Marzulli Joseph S. Wiles Leonard L. Brown	Factors Affecting Percutaneous Toxicity to Rabbits of GB, VE and EA 1677 (U)	6 May 57
CWLR 2123	Charles G. Wilber	Observations on the Effects of EA 1729 on Various Animals, With a Possible Mechanism of Action (U)	6 May 57

UNCLASSIFIED

16

Command Historical Office, CBDCOM  
 Edgewood Arsenal, MD  
 Edgewood Room; Cabinet 35; Drawer #5

**UNCLASSIFIED**

<u>Report No.</u>	<u>Author(s)</u>	<u>Title</u>	<u>Date</u>
CWLR 2124	Wm. E. Rinehart Martin A. Ross Jackie L. Papin Earle A. Greene Wm. A. Groff K. Jacobson	The Subacute and Chronic Toxicity of An Aniline-Furfury Alcohol-Hydrastine Vapor Mixture (U)	20 May 57

3. (U) Papers for Publication and/or Presentation.

The following papers were cleared during the report period for publication and/or presentation:

<u>Author(s)</u>	<u>Title</u>	<u>Proposed Use</u>
Keith H. Jacobson	The Military Chemicals Program	Publication: Armed Forces Chemical J.
David B. Dill	Regulation of Hemoglobin Concentration	Presentation: Mtg of Aero-Med. Assoc., Denver, Colo., 6 May 57 Publication: J. Aviation Med.
J. R. M. Innes E. J. Donati Paul P. Yevich	Fragments of Hair, Epidermal and Extraneous Matter Causing Haphazard Lesions in the Lungs of Mice After Intravenous Injections	Publication: Arch. Path.
R. I. Ellin A. A. Kondritzer D. H. Rosenbalt	Studies on the Purity of Dimercaprol (BAL)	Publication: Am. Pharm. Assoc. Sci. Ed. Presentation: Am. Pharm. Assoc. Convention, N.Y., 3 May 57
John A. Clements	Respiratory Mechanics in Resuscitation	Presentation: CmlC Conf. on Artificial Respiration, Univ. of Colo., Sch. of Med., Denver, Col., 9 May 1957
J. H. Wills	Principles of Treating Nerve Gas Poisoning	Presentation: CmlC Conf. on Artificial Respiration, Univ. of Colo., Sch. of Med., Denver, Col., 9 May 1957
Charles S. Petty	Organic Phosphate Insecticide Poisoning Residual Effects in Two Gases	Publication: Am. J. Med. Presentation: Contractors Meeting Rocky Mt Arsenal, 10 May 1957

**UNCLASSIFIED**

Command Historical Office, CBDCOM  
Edgewood Arsenal, MD  
Edgewood Room; Cabinet 35; Drawer #5

**UNCLASSIFIED**

<u>Author(s)</u>	<u>Title</u>	<u>Proposed Use</u>
David Grob	Experience in Nerve Gas Poisoning	Presentation: Denver Conf. on Artificial Respiration, Denver, Colo. 10 May 1957
G. Stanley Woodson	Time as a Response	Presentation: Third Annual Statistical Symposium, Army Chemical Center, 2-3 May 57
W. H. Hill J. M. Merrill E. C. Montiegel B. J. Palm J. Schmitt M. Schulte	A Method of Alkaline Tissue Digestion Used in the Analysis of Biological Materials for Boron	Publication: Am. Indust. Hygiene Assoc. Quarterly
Carlton L. Smith	Cytotoxic Effects of Anti-Cholinesterase Compounds on Cultured Chicken Monocytes	Presentation: As Thesis for a Master of Science Degree, Univ. of Maryland
Robert D. Appleman James C. Delouche	Behavioral, Physiological and Biochemical Responses of Goats to Temperature 0° to 40°C.	Publication: Animal Sci. J.
Irvin H. Blank Robert D. Griesemer Edith Gould	The Penetration of an Anticholinesterase Agent (Sarin) Into Skin. I. Rate of Penetration Into Excised Human Skin	Presentation: Annual Mtg. of Soc. for Investigative Dermatology, New York, N.Y., 1 Jun 57
Dietrich Bodenstein	Contributions to the Problem of Eye Pigmentation in Insects: Studied by Means of Intergeneric Organ Transplantations in Diptera	Publication: Smithsonian Inst. Pub., Wash., D. C.
Max Krauss	Studies in Wound Ballistics: Temporary Cavity Effects in Soft Tissues	Publication: Military Medicine (formerly Military Surgeon)
Archer S. Gordon	Manual Artificial Respiration	Publication: Book on Artificial Respiration
Edward LeB. Gray	Table entitled "Paired Experiments Measuring Survival Times of Rats Exposed to Lethal NO <sub>2</sub> Concentrations"	Publication: Am. J. Vet. Research
Ward R. Richter	Tubular Adenomata of the Adrenal of the goat	Proposed Use: The Cornell Veterinarian, James Law Hall, Ithaca, N. Y.

18  
**UNCLASSIFIED**

Command Historical Office, CBDCOM  
Edgewood Arsenal, MD  
Edgewood Room; Cabinet 35; Drawer #5

**UNCLASSIFIED**

<u>Author(s)</u>	<u>Title</u>	<u>Proposed Use</u>
Bertram Sacktor Donald G. Cochran	The Respiratory Metabolism of Insect Flight Muscle I. Manometric Studies of Oxidation and Concomitant Phosphorylation with Sarcosomes	Publication: Arch. Biochem. Biophys., Academic Press, New York, N. Y.
J. A. LeBlanc F. J. Rosenberg	Local and Systemic Adaptation to Topical Cold Exposure	Publication: Am. J. Physiol. Washington 14, D.C.
George B. Craig, Jr.	Parthenogenesis in <u>Aedes Aegypti</u>	Publication: Records of the Genetics Society of America
R. Eisenstein E. J. Donati	Multiple Visceral Necroses Following Injection of Serotonin	Publication: A.M.A. Arch. Path.
Edmund F. Murtha Dorothy E. Stabile J. Henry Wills	Some Pharmacological Effects of Puffer Poison	Publication: J. Pharmacol. Exptl. Therap.
David Grob John C. Harvey	Effects in Man of the Anticholinesterase Compound Sarin	Publication: J. Pharmacol. Exptl. Therap. or J. Clin. Invest.
David B. Dill	Regulation of the Heart Rate	Publication: The Paul J. Hober Co., New York City, N.Y., Presentation: Some phases were presented on 16 May 57 at the First Wisconsin Conf. on "Work and the Heart" held at Marquette Univ.
J. LeBlanc F. Rosenberg	Mast Cell Changes in Animals Exposed to Cold	Publication: Local Committee, The American Physiological Society
K. H. Jacobson	List of Reports Published Under the Health Hazards of Military Chemicals Program. Project No. 4-61-14-002	Publication: Cleared in advance to publication.
D. B. Dill S. M. Horvath F. N. Craig	Responses to Exercise as Related to Age	Presentation: Fall meeting of the American Physiological Society 3-6 Sep. 57, Iowa City, Iowa

19  
**UNCLASSIFIED**

Command Historical Office, CBDCOM  
Edgewood Arsenal, MD  
Edgewood Room; Cabinet 35; Drawer #5



UNCLASSIFIED

<u>Author(s)</u>	<u>Title</u>	<u>Proposed Use</u>
Elwyn S. Brown Rudolph P. Johnson John A. Clements	Pulmonary Surface Tension	Publication: Journal of Applied Physiology, Special Communication Section
John A. Clements Elwyn S. Brown Rudolph P. Johnson	Pulmonary Surface Tension and the Mucus Lining of the Lungs	Publication: Applied Physiol. Special Communications Section

UNCLASSIFIED<sup>20</sup>

Command Historical Office, CBDCOM  
Edgewood Arsenal, MD  
Edgewood Room; Cabinet 35; Drawer #5

UNCLASSIFIED

D. (C) Directorate of Research.

1. (U) Reorganization.

The division chief of the Biological Assessment Division resigned and a successor of the required professional stature could not be located. Since the personnel strength in this division was not at a level comparable to that of the other divisions of the directorate, the division was abolished on 21 June 1957 (see I, C, 3, above). The Special Evaluation Branch was also abolished and its personnel were transferred to the Bioanalytical Branch. The Toxicity Screening Branch was transferred to Chemical Research Division to bring the organic chemists and biologists in the agents program closer together. The Bioanalytical Branch was transferred to the Biochemical Research Division to restore personnel who were separated from it upon establishment of the Biological Assessment Division. The result is expected to be an improvement in administration and a strengthening of the project program.

2. (C) Technical Reports.

The following technical reports were distributed during the report period:

<u>Report No.</u>	<u>Author(s)</u>	<u>Title</u>	<u>Date</u>
CWLR 2101	Charles E. Williamson Thomas P. Dawson	Studies Involving the Geometrical Structures of Certain 2-Alkoxy-carbonyl-1 Methylvinyl Cyclohexyl Methylphosphonates (C)	20 Mar 57
CWLR 2102	S. Sass P. Davis C. Morgan N. Ingber I. Masters	Methods for the Analysis of GS and its Intermediates (U)	15 Mar 57
CWLR 2108	T. C. Simmons R. G. Roth R. S. Hanzel R. J. Ess J. V. Marra F. W. Hoffmann	Transesterification of Diethyl and Diisopropyl Methylphosphonite with 2-(Diethylamino)- and 2-(Diisopropylamino) Ethanol (C)	8 Apr 57
CWLR 2110	Lillian W. Conn Richard G. Horton Joseph S. Wiles	Toxicity Screening XV.EA Compounds (EA 1676, 1677, 1679, 1695, 1697-1701, 1703) (Screened 1 Jul through 31 Dec 1955) (U)	12 Apr 57
CWLR 2115	T. C. Simmons R. S. Hanzel E. J. Conklin R. G. Roth J. V. Marra F. W. Hoffmann	The Synthesis of Dialkyl Methylphosphonites (U)	19 Apr 57

UNCLASSIFIED

Command Historical Office, CBDCOM  
Edgewood Arsenal, MD  
Edgewood Room; Cabinet 35; Drawer #5

UNCLASSIFIED

<u>Report No.</u>	<u>Author(s)</u>	<u>Title</u>	<u>Date</u>
CWLR 2118	James Batts J. Epstein	Estimation of Concentration of V Agents in Water by Fish Toxicity (U)	6 May 57
CWLR 2119	Norwood K. Schaffer Leon Simet Harry O. Michel Richard W. Drisko Robert E. Plapinger	O-Seryl Ethylphosphonic Acid from the VE Derivative of Chymotrypsin (C)	20 May 57
CWLR 2125	J. Epstein V. E. Bauer M. Chasanov	Kinetics and Mechanisms of the Hydrolysis of EA 1517 in Dilute Aqueous Solution (U)	29 May 57
CWLR 2127	Thomas R. Moore Friedrich W. Hoffmann	The Production of VX (EA 1701): Step 3 (U)	20 May 57

3. (U) Papers for Publication and/or Presentation.

The following papers were cleared during the report period for publication and/or presentation:

<u>Author(s)</u>	<u>Title</u>	<u>Proposed Use</u>
James D. Wilcox	Our Atmosphere--Fog	Presentation: Science Dept. & Science Club of Salem College, Salem, W. Va. by invitation 16 Apr 57, & Science Dept. & Science Club of Fairmount State Teachers College, Fairmont, W. Va. (by invitation) 17 or 18 Apr 57
Herbert S. Aaron Thomas M. Shryne Jacob I. Miller	The Stereochemistry of Asymmetric Phosphorus Compounds. I. The Resolution of an Organophosphonothioic Acid	Publication: J. Am. Chem. Soc.
E. A. Metcalf	The Role of Industry in the Search for New Toxic Agents	Publication: Armed Forces Chemical Journal Presentation: Natl. Mtg. of Armed Forces Chem. Assoc., 22 May 57, Wash, D. C.
Sp3 Nicholas G. Lordi Joseph Epstein	Kinetics and Mechanism of Chlorination of Triethylphosphorothiolate in Dilute Aqueous Media at 25°C.	Publication: J. Am. Chem. Soc.
Robert W. Gates	Method of Preparing Low Cost Filter-Holders	Publication: Ind. Eng. Chem. Anal. Ed.

UNCLASSIFIED

Command Historical Office, CBDCOM  
Edgewood Arsenal, MD  
Edgewood Room; Cabinet 35; Drawer #5

UNCLASSIFIED

<u>Author(s)</u>	<u>Title</u>	<u>Proposed Use</u>
Jack H. Oppenheimer Henry M. Wise David A. Lasley Harold G. Holmes	The Role of the Thyroid Gland in Experimental Traumatic Shock	Publication: J. Clin. Invest.
Frederick S. Lee Lawrence C. Buckles	A Punched Card System for Recording Corrosion Data	Publication: J. Chem. Education
J. W. Churchill J. A. Zaslowsky M. Lapkin F. Martinez	Concerted Displacement Reactions: The Reaction of Catechol with Halides	Presentation: American Chemical Society, 32nd National Meeting, New York, N.Y., Publication: J. Am. Chem. Soc.
Rudolph Macy Benjamin L. Harris Willard C. Bull John W. Eastes	Inhibition of Corrosion of Steel by Tetramethylammonium Bromide	Publication: Ind. Eng. Chem.
Edward J. Poziomek Brennie E. Hackley, Jr. George M. Steinberg	Quarternary Pyridine Oximes	Publication: J. Org. Chem.
Herbert S. Aaron Harry O. Michel Benjamin Witten Jacob I. Miller	The Stereochemistry of Asymmetric Phosphorus Compounds. II. Stereospecificity in the Irreversible Inactivation of Cholinesterases by the Enantiomorphs of an Organophosphorus Inhibitor	Publication: J. Am. Chem. Soc.

Command Historical Office, CBDCOM  
Edgewood Arsenal, MD  
Edgewood Room; Cabinet 35; Drawer #5