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Foreign Medical Materiel Exploitation Annual Report (U)

December 1991



**ARMED FORCES
MEDICAL
INTELLIGENCE CENTER**

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Armed Forces Medical Intelligence Center (AFMIC)
Foreign Materiel Exploitation Program

Foreign Materiel Exploitation Annual Report (U)

December 1991

AFMIC's fifth annual report on the status and value of exploitation projects
ongoing or completed during the previous year.

*Denial
1.5 (C)*

*Classified by Director, AFMIC
Declassify OADR*

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PREFACE

(S) This annual report informs the reader of foreign medical materiel exploitation projects sponsored by the Armed Forces Medical Intelligence Center (AFMIC) during 1991. 1.5 (C)

(U) For each project, the scope and status are described, the intelligence production and/or medical materiel development programs supported are listed, and the achieved or anticipated value is provided.

(S) The purpose of foreign medical materiel exploitation is to provide technical details and factual information on foreign medical materiel to intelligence analysts and materiel developers. 1.5 (C)

(U) Foreign medical materiel exploitation is a Department of Defense/Defense Intelligence Agency-assigned mission of AFMIC.

(U) Each classified paragraph, caption, and title in this report has been properly marked; those unmarked are unclassified.

(U) Consumers interested in further details on the projects listed in this publication or on any foreign medical products, including the acquisition and exploitation of such products, should contact DIA Statute AFMIC Foreign Materiel Exploitation Program, DIA Statute

(U) Request any amplification of subject matter, constructive criticism, comments, or suggested changes be forwarded to the Director, Armed Forces Medical Intelligence Center, Fort Detrick, Frederick, MD 21702-5004.

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KEY JUDGMENTS

(E) During 1991, 26 foreign materiel exploitation projects were sponsored by AFMIC. Sixteen of these were completed and 10 are continuing. 15 (E)

(U) The following Department of Defense (DOD) materiel development organizations or planning units participated in one or more of the projects.

- US Army Medical Research Institute of Infectious Diseases
- US Army Medical Research Institute of Chemical Defense
- US Army Institute of Surgical Research
- US Army Biomedical Research and Development Laboratory
- Walter Reed Army Medical Center
- US Army Academy of Health Sciences
- US Army Science and Technology Center, Europe
- Naval Medical Research Institute
- US Air Force Human Systems Division
- Uniformed Services University of the Health Services
- Armed Forces Radiobiology Research Institute

(E) The following 15 exploitations primarily support the materiel development community.

- Russian Anthrax Vaccine and Globulin
- 25X6 System for Training Casualty Evacuation Management
- Chinese Burn Ointments
- Hungarian Anti-Viral Cream
- Russian Drug for Laser Eye Injuries
- (Former) East German Nerve Agent Prophylactic
- 25X6 Snake Venom Detection Kit
- Russian Antidote
- Finnish/Norwegian Blood Bag Warmer/Over-Pressure Systems
- Saudi Arabian Soil and Sand Samples
- Cuban Interferon
- Iraqi Mustard Protective Cream
- Russian Blood Parameter Measurement Device
- Spanish Burn Ointment
- Bulgarian Radioprotective Drug

15 (E)

KEY JUDGMENTS (continued)

~~(C)~~ The following 11 exploitations primarily provide technical details and factual information for intelligence products, assessments, and data bases.

- Middle East Pharmaceuticals
- Chinese Pharmaceuticals
- Unknown Antagonist for Cocaine
- Brazilian Cobra Antivenom
- Hungarian Nuclear, Biological, and Chemical (NBC) Medical Kit
- (Former) East German Chemical Warfare (CW) Medical Kit, MSP K-12/A
- Yugoslavian Chemical Warfare (CW) Skin Decon/Medical Kit
- Iraqi Chemical Warfare (CW) Skin Decon/Medical Kit
- (Former) East German Field Detection Laboratory, EFL-F
- Bulgarian Chemical Warfare (CW) Skin Decon/Medical Kit, IZP-2
- Bulgarian Chemical Warfare (CW) Skin Decon/Medical Kit, IZP-3

~~(C)~~ The following materials exploited during 1991 were acquired in the Kuwaiti Theater of Operation during Desert Shield/Desert Storm.

- Saudi Arabian Soil and Sand Samples
- Iraqi Mustard Protective Cream
- Yugoslavian Chemical Warfare (CW) Skin Decon/Medical Kit
- Iraqi Chemical Warfare (CW) Skin Decon/Medical Kit

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GLOSSARY

AFMIC.....Armed Forces Medical Intelligence Center
AFRRI.....Armed Forces Radiobiology Research Institute
AHSUnited States Army Academy of Health Sciences
BWbiological warfare
CWchemical warfare
DoD.....Department of Defense
HSDUnited States Air Force's Human Systems Division
ICDUnited States Army Medical Research Institute of Chemical Defense
ISRUnited States Army Institute of Surgical Research
NBC.....Nuclear, Biological, and Chemical
NMRI.....Naval Medical Research Institute
USABRDL.....United States Army Biomedical Research and Development Laboratory
USAMRIIDUnited States Army Medical Research Institute of Infectious Diseases
USUHSUniformed Services University of the Health Sciences

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SECTION I

Exploitations Ongoing

Middle East Pharmaceuticals

(*CNF*) *Project Description.* Manufacturers' names, addresses, and products are being extracted from the labels of Iranian, Iraqi, and other Middle East pharmaceuticals. This information is being supplemented by data base research. The information is being added to a data base management system that will give users pharmaceutical production site names, locations, and product names. (AFMIC 125-87)

1.5(c)

(*CNF*) *Project Status.* Additional pharmaceuticals were acquired during Desert Storm. More than 300 Middle East pharmaceutical production sites have been added to the automated data base. A report has been prepared on Iraqi pharmaceutical production sites, and the next report will be on Iran. Photographic data bases need to be developed. Foreign materiel acquisition requirements are being developed on selected countries.

(U) *Programs Supported.* This exploitation supports AFMIC's general medical intelligence assessments and pharmaceutical production data bases.

(U) *Value.* Pharmaceutical production site names, locations, and products are valuable in assessing a country's medical industry. Comparing the sites with suspected biological warfare (BW) agent production sites supports assessments on the suspected BW sites.

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Chinese Pharmaceuticals

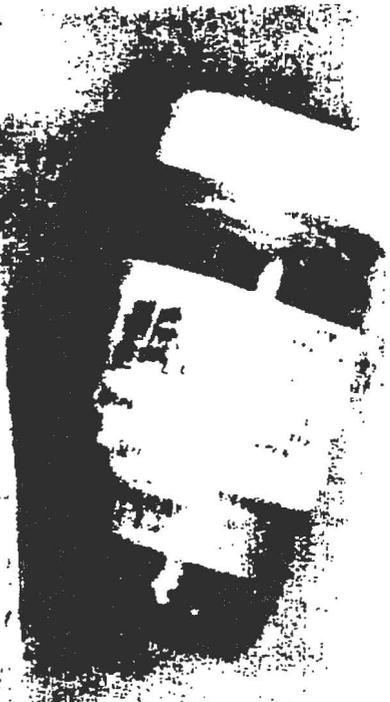
(CAF) *Project Description.* Manufacturers' names, addresses, and products are being extracted from the labels of Chinese pharmaceuticals. This information is being supplemented by data base research. The information is being added to a data base management system that gives users pharmaceutical production site names, locations, and products. (AFMIC 082-90)

(CAF) *Project Status.* A few Chinese pharmaceuticals have been acquired. An initial data base review has been completed, and the names of several production sites have been entered into the automated data base. A foreign materiel acquisition requirement for Chinese pharmaceuticals needs to be developed, and a report needs to be finalized.

(U) *Programs Supported.* This exploitation supports AFMIC's general medical intelligence assessments and pharmaceutical production data bases.

(U) *Value.* Pharmaceutical production site names, locations, and products are valuable in assessing a country's medical industry. Comparing these sites with suspected BW agent production sites supports assessments concerning the suspected BW sites.

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1980

Soviet Anthrax Vaccine and Globulin

~~(C/NF)~~ *Project Description.* The US Army Medical Research Institute of Infectious Diseases (USAMRIID) is exploiting a Soviet anthrax vaccine, a globulin, and accompanying literature. (AFMIC 171-91)

} 15(c)

(U) *Project Status.* The evaluation is continuing.

(U) *Programs Supported.* This exploitation supports USAMRIID's programs to develop vaccines and drugs against BW agents. Anthrax is considered to be a likely BW threat agent. Iraq was developing anthrax as a weapon.

~~(C)~~ *Value.* Soviet anthrax vaccine and globulin samples are important because, with the samples, scientists are able to characterize the anthrax strains in the vaccine. This characterization is needed to develop vaccines against various strains.

} 15(c)

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Unknown Antagonist for Cocaine

(~~C/NF~~) *Project Description.* The US Army Medical Research Institute of Chemical Defense (ICD) is preparing to analyze an unknown liquid that reportedly eliminates cocaine-caused symptoms. The liquid was obtained in Panama. (AFMIC 172-91)

}
1.5(C)

(U) *Project Status.* The analysis is being planned.

(U) *Programs Supported.* This exploitation supports assessments related to foreign narcotics trade and consumption.

(U) *Value.* The identification of the composition of a cocaine "antagonist" is of interest to counter-drug analysts and medical personnel.

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25X6

System for Training Casualty Evacuation Management

(CONF) Project Description. A 25X6 system, called 25X6 simulates command and control situations for large-scale casualty evacuation from front lines to rear areas. The system, used for training purposes, is being evaluated by the Uniformed Services University of the Health Sciences (USUHS), the US Army Academy of Health Sciences (AHS), and other medical unit personnel. (AFMIC 174-91)

1.5 (c)

(C) Project Status. 25X6 personnel briefed the system to several US Army and Department of Defense medical units. System disks are being sent to USUHS and AHS personnel for evaluation.

(U) Programs Supported. This system would support US Army medical personnel training.

(C) Value. Training efficiencies would be gained. For a similar system to be developed in the US, the Army's costs probably would be greater than the 25X6 licensing fee.

1.5 (c)

Chinese Burn Ointments

(~~CNF~~) *Project Description.* The US Army Institute of Surgical Research (ISR) is evaluating two Chinese burn ointments. Sanhuang Pearl extract, a traditional Chinese medication, is made from sulphur, realgar, and other ingredients mixed in tung oil. The second ointment, called Mebo, has sesame oil, which helps moisten the burn area. (AFMIC 168-91; AFMIC 178-91)

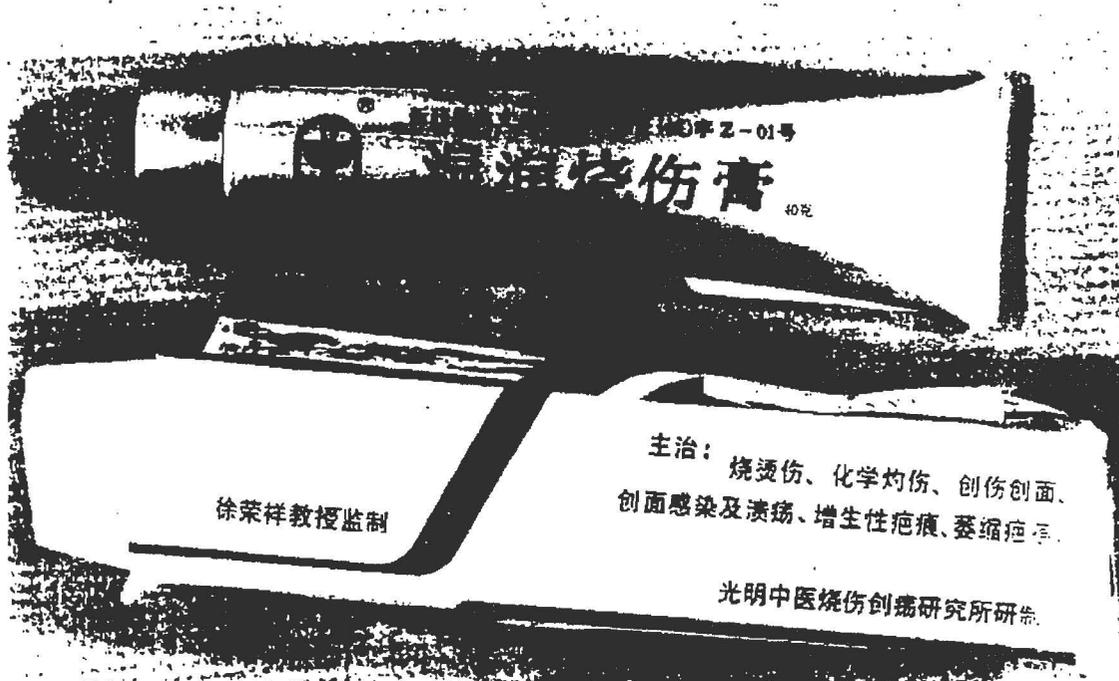
}
1.5/91

(U) *Project Status.* Package inserts are being translated.

(U) *Programs Supported.* ISR's programs to identify and develop better burn ointments are supported by this exploitation.

(U) *Value.* Improved burn ointments would be of value because the potential for burn injuries is high in modern warfare.

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Hungarian Anti-Viral Cream, Hevizos

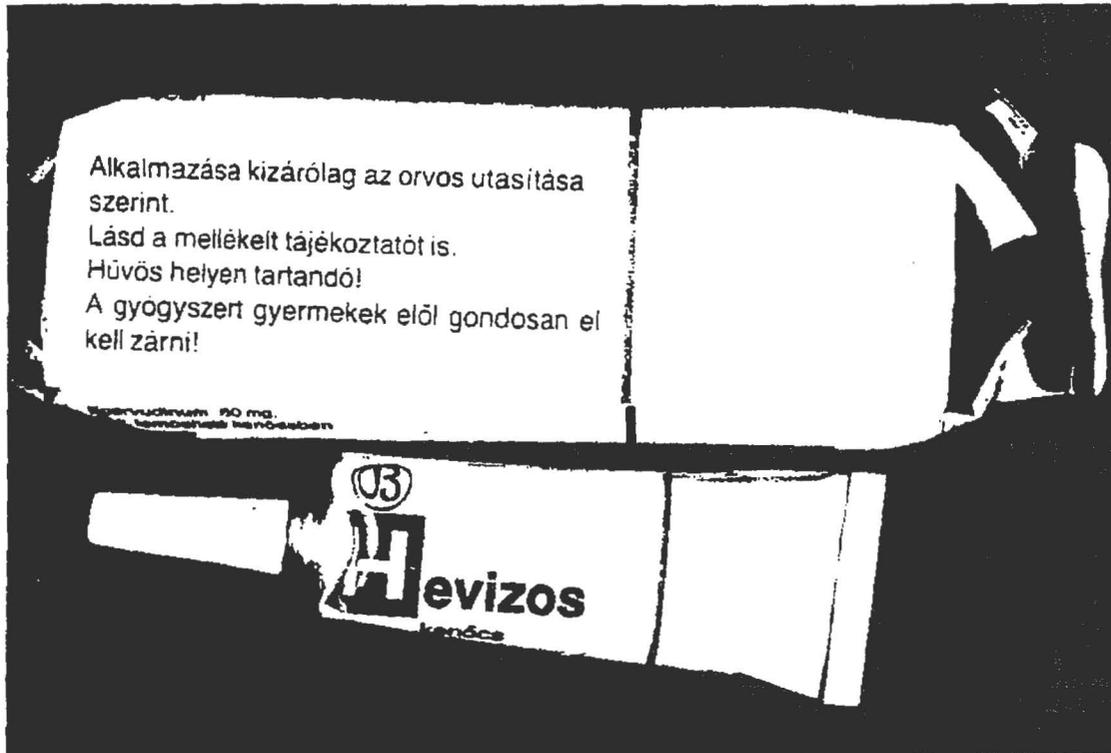
(~~CNF~~) *Project Description.* A reportedly new anti-viral drug, hevizos (5-isopropyl-2'-beta-deoxyuridine), is made by the Hungarian Biogal Pharmaceutical Company. The cream is used to treat the viral skin disease herpes. (AFMIC 179-91) } 1.5 (c)

(U) *Project Status.* USAMRIID, which has a sample of the drug, is evaluating literature on the drug.

(U) *Programs Supported.* USAMRIID's program to screen for new anti-viral drugs is supported by this program.

(~~E~~) *Value.* Exploitation of this drug enhances USAMRIID's screening program for new anti-viral drugs. 1.5 (c)

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Brazilian Cobra Antivenom

~~(C/NF)~~ *Project Description.* USAMRIID is evaluating a Brazilian drug claimed to be an antidote for cobra venom. (AFMIC 190-91) } i.s.c.

(U) *Project Status.* The label on the drug has been translated.

~~(C)~~ *Programs Supported.* USAMRIID's programs to investigate the characteristics of toxins and treatments for them are supported by this exploitation. The exploitation also supports AFMIC's data base and assessments on Brazilian pharmaceutical production capabilities. } i.s.c.

(U) *Value.* The exploitation helps materiel developers become aware of an interesting foreign product.

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Emoxipin, Soviet Drug for Eye Laser Injuries

(~~C/NF~~) *Project Description.* Emoxipin (2-ethyl-6-methyl-3 hydroxypyridine hydrochloride), a Soviet-developed drug reported to be useful in treating laser-induced ocular damage, is being evaluated by a Texas university under contract to the US Air Force's Human Systems Division (HSD). (AFMIC 001-92)

1.5 (C)

(~~C~~) *Project Status.* Review articles written by Soviet scientists on the preclinical, clinical, toxicologic, and other aspects of emoxipin are being reviewed.

(U) *Programs Supported.* HSD programs to develop effective treatment for laser-induced ocular injuries are supported by this exploitation.

(U) *Value.* The exploitation alerts medical materiel developers to a potentially interesting and unique drug.

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(Former) East German Nerve Agent Prophylactic Drug

~~(CONF)~~ *Project Description.* ICD is exploiting a (former) East German nerve agent prophylactic drug. Information indicates that the drug consists of an unidentified centrally-acting cholinolytic, an unidentified anticonvulsive, and an unidentified reversible cholinesterase inhibitor. (AFMIC 188-91)

}
1.1/1

(U) *Project Status.* Analysis is being conducted.

(U) *Programs Supported.* This exploitation supports AFMIC's program to assess the chemical warfare (CW) treatment capabilities of foreign countries. It also supports ICD's programs to develop antidotes and other medications for CW agents.

(U) *Value.* Knowing the composition of antidotes used by other countries is of value to the military and supports the technical data bases.

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SECTION II

Exploitations Completed

25X6 Snake Venom Detection Kit

(CONF) *Project Description.* USAMRIID examined 25X6 snake venom detection kit to increase USAMRIID's knowledge of toxin detection technology. 25X6 has several poisonous snake species. Although available polyvalent snake antivenoms are effective against most (if not all) of these species, in some situations, identification of the biting snake is important. The kit was designed for this purpose. (AFMIC 079-90)

} 1.5 (c)

(U) *Project Status.* Completed.

(U) *Programs Supported.* This exploitation supported USAMRIID's program to develop toxin detection technology.

(C) *Value.* Exploitation of the kit helped to confirmed USAMRIID's assessment that snakes are not species likely to be encountered by US Army personnel. Therefore, technology in the detection kit was of little further interest.

} 1.5 (c)

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AFIN, A Soviet Antidote

(~~CANF~~) *Project Description.* AFIN, a Soviet antidote mixture, was analyzed in the early 1980s. A recently acquired sample was analyzed to compare the composition to the earlier sample. ICD analysis showed that the recently acquired AFIN had the same composition as that of the early 1980s sample. (AFMIC 048-90) } 15(c)

(U) *Project Status.* Completed.

(U) *Programs Supported.* This exploitation supports ICD's program to develop better antidotes and AFMIC's program to assess the chemical warfare medical treatment capabilities of foreign countries.

(~~C~~) *Value.* AFIN is a usual nerve agent antidote. Knowing AFIN's composition benefits US Army scientists responsible for developing better nerve agent antidotes. } 15(c)

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Hungarian Nuclear, Biological, and Chemical (NBC) Medical Kit

~~(CONF)~~ *Project Description.* ICD exploited a Hungarian civil defense NBC medical kit. The kit contained reasec, an antiperistaltic and anticholinergic; thiethylperazine, an antiemetic; AET, a radioprotectant; vitamins; and decontaminants for the skin. The antidotes and drugs are known, and their chemical analysis was not needed. Manufacturers' names and addresses from the labels have been added to the automated pharmaceutical production site data base. (AFMIC 241-89)

} 1.5(c)

(U) *Project Status.* Completed.

(U) *Programs Supported.* ICD's program to develop improved CW agent treatment and skin decontamination materiel and AFMIC's program to assess foreign CW treatment capabilities are supported by this exploitation.

~~(C)~~ *Value.* Manufacturers' names and addresses, and the antidotes and other military-related drugs that the manufacturers produce are useful. This information allows the targeting of these facilities for additional information. Drugs and decontaminants used by other militaries are important data base information.

} 1.5(c)

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Finnish/Norwegian Blood Bag Warmer/Over-Pressure Systems

(~~C/NF~~) *Project Descriptions.* The US Army Biomedical Research and Development Laboratory (USABRDL) evaluated Finnish and Norwegian systems designed to prevent blood and other transfusion fluid from freezing during patient transport. The systems also allow over-pressure to be applied manually to the liquid-containing bag so that the liquid will flow from the bag without relying on gravity, allowing the systems to be used within a casualty bag and in other confining spaces. (AFMIC 051-87; 165-89)

} 15 (C)

(U) *Project Status.* Completed.

(U) *Programs Supported.* The exploitations supported USABRDL's program entitled "Technical Feasibility of Medical Equipment."

(U) *Value.* Comparing the effectiveness of these systems to US systems assisted USABRDL in characterizing the limitations and advantages of US Army systems. Fluid freezing in transfusion bags has been a problem.

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Saudi Arabian Soil and Sand Samples.

(CONF) Project Description. The Naval Medical Research Institute (NMRI) Shock Research Group characterized the physical properties (such as particle size distribution and inorganic elemental composition) of soil and sand collected from Saudi Arabian locations shortly after the beginning of Desert Shield. The irritation and infection effects of the soil and sand on rat's peritoneal cavities also were determined. The data helps to predict problems caused by soil and sand in open wounds. (AFMIC 028-91)

1.5(4)

(U) Project Status. Completed.

(U) Programs Supported. This exploitation supported NMRI's program to provide information on the clinical and pathologic problems caused by soil and sand in wounds.

(U) Value. Results were obtained on the physical characteristics of Saudi Arabian soil and sand, and on the irritation and infectious effects on rat's peritoneal cavities. A report is available.

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Cuban Interferon, Inrec

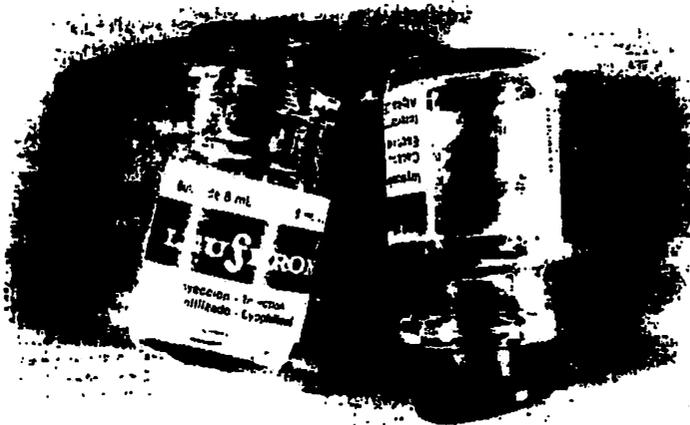
(~~CNF~~) *Project Description.* USAMRIID evaluated Inrec, a Cuban genetically-engineered interferon. Tests showed Inrec to be as active and pure as US- and European-produced interferons. (AFMIC 035-91) } 15(c)

(U) *Project Status.* Completed.

(U) *Programs Supported.* This exploitation supports USAMRIID's program to develop effective anti-viral drugs. Interferons are anti-viral drugs. Disease-causing viruses can be difficult to treat. Some viruses are potential BW agents. This exploitation also supports AFMIC's program to assess foreign biotechnology capabilities.

(~~CNF~~) *Value.* Testing of Cuban interferon allows USAMRIID scientists to become familiar with the characteristics of foreign interferons, and adds to the technical data base. The exploitation supports AFMIC's Cuban pharmaceutical production site data base. } 15(c)

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Iraqi Mustard Protective Cream

(S/NF) *Project Description.* ICD exploited a cream issued to Iraqi personnel. Instructions with the cream indicated that it is used to protect against mustard agent by decontaminating the agent. The State Company for Drug Industries, Samarra, Iraq, was written on the tube's label. Analysis found lanolin and chloramine T in the cream. Chloramine T is a well-known decontaminant for mustard agent. (AFMIC 173-91)

} 1.5(C)

(U) *Project Status.* Completed.

(U) *Programs Supported.* This exploitation supports AFMIC's program to assess the CW medical treatment capabilities of foreign countries. It also supports ICD's program to develop protective creams for mustard agent.

(U) *Value.* Information on foreign-used medical and protective products for mustard is of value. Mustard is a likely CW agent for use against US forces. Iraq used mustard extensively in the Iran-Iraq War.

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(Former) East German Chemical Warfare (CW) Medical Kit, MSP K-12/A

(C/NF) Project Description. ICD exploited the (former) East German CW medical kit, MSP K-12/A. Five medications, in liquid form in syrettes, came with the kit. These were a) a nerve agent antidote consisting of obidoxime, atropine, and an ester; b) a nerve agent prophylactic consisting of an ester and a bisquanternary ammonium salt; c) a cyanide antidote; d) the analgesic meperidine; and e) the anti-emetic metoclopramide. (AFMIC 038-91) } 1579

(U) Project Status. Completed.

(U) Programs Supported. This exploitation supports AFMIC's program to assess the CW treatment capabilities of foreign countries. It also supports ICD's programs to develop antidotes and other medications for CW agents.

(U) Value. Knowing the composition of foreign antidotes and other CW medications used by foreign militaries is of value and supports the technical data base.

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Yugoslavian Chemical Warfare (CW) Skin Decon/Medical Kit

(~~CNF~~) *Project Description.* ICD exploited a Yugoslavian-made CW individual skin decontamination and medical kit. The kit was recovered during Desert Shield and has Arabic markings and instructions on it. The kit contained a mixture of atropine and 2-PAM as a nerve agent antidote; a mixture of ethanol, ethyl ether, and chloroform as an anti-smoke agent; and sodium bicarbonate as a decontaminant. (AFMIC 040-91)

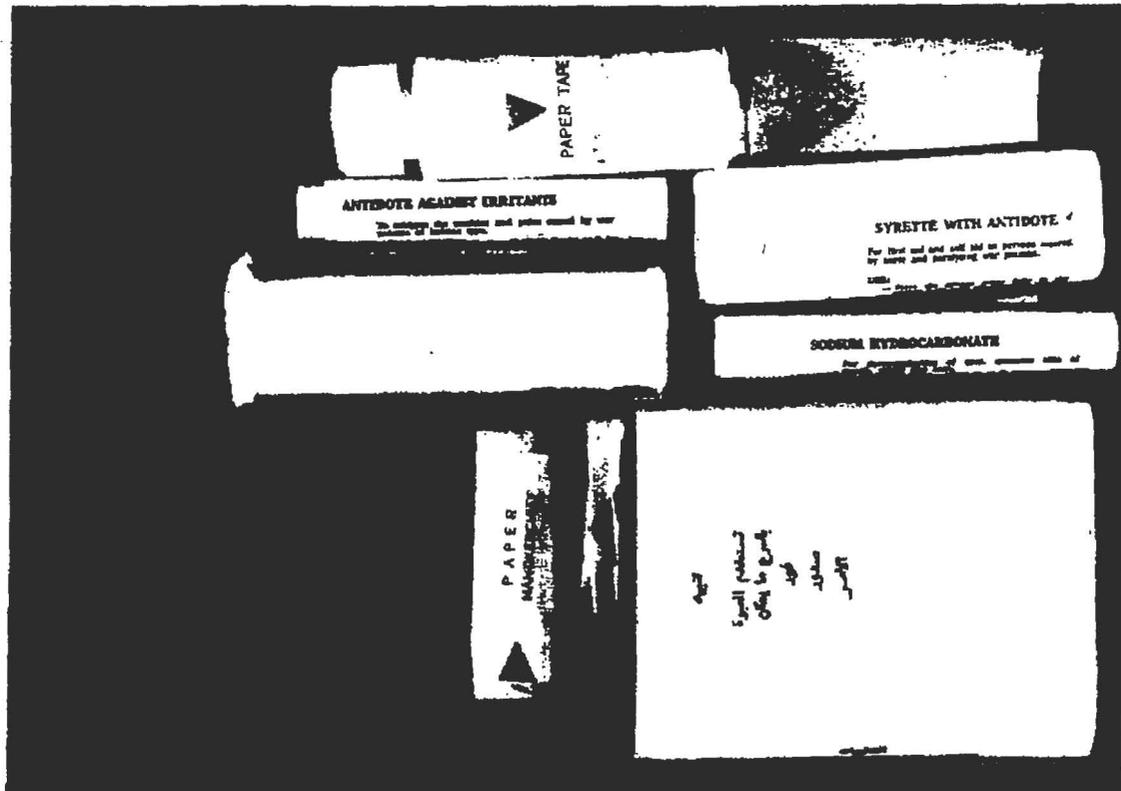
1.5(4)

(U) *Project Status.* Completed.

(U) *Programs Supported.* This exploitation supports AFMIC's program to assess the CW treatment capabilities of foreign countries. It also supports ICD's program to develop antidotes and other medications for CW agents.

(U) *Value.* Knowing the composition of antidotes and other CW medications used by foreign militaries is of value and supports the technical data base.

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Iraqi Chemical Warfare (CW) Skin Decon/Medical Kit

(CONF) Project Description. ICD exploited a CW skin decontamination and medical kit, obtained from an Iraqi defector during Desert Shield. The kit was almost certainly produced in Bulgaria, because an almost identical kit, the IZP-2, was obtained from Bulgaria. The only difference was that the labels were in Arabic rather than Bulgarian. The kit contained syrettes of ephedrine and TMB-4 as a nerve agent antidote; amyl nitrite antidote for cyanide; and skin decontaminants. (AFMIC 041-91)

} 15 (c)

(U) Project Status. Completed.

(U) Programs Supported. This exploitation supports AFMIC's program to assess the CW treatment capabilities of foreign countries. It also supports ICD's programs to develop antidotes and other medications for CW agents.

(U) Value. Knowing the composition of antidotes and other CW medications used by foreign militaries is of value and supports our technical data base.

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Soviet Blood Parameter Measurement Device

(~~C/NF~~) *Project Description.* A Soviet-made device, the BCD Blood Indicator, measures conductivity in blood to determine what is described as a blood circulation deficient value (or coagulation of circulating blood) and a hematocrit value. Hematologists at the Walter Reed Army Medical Center evaluated translated documents, including company brochures, reports on the device prepared by Bulgarian scientific institutes, operating instructions, and descriptions of the device. These specialists concluded that the BCD does not provide any data that US-made devices cannot provide. (AFMIC 052-91)

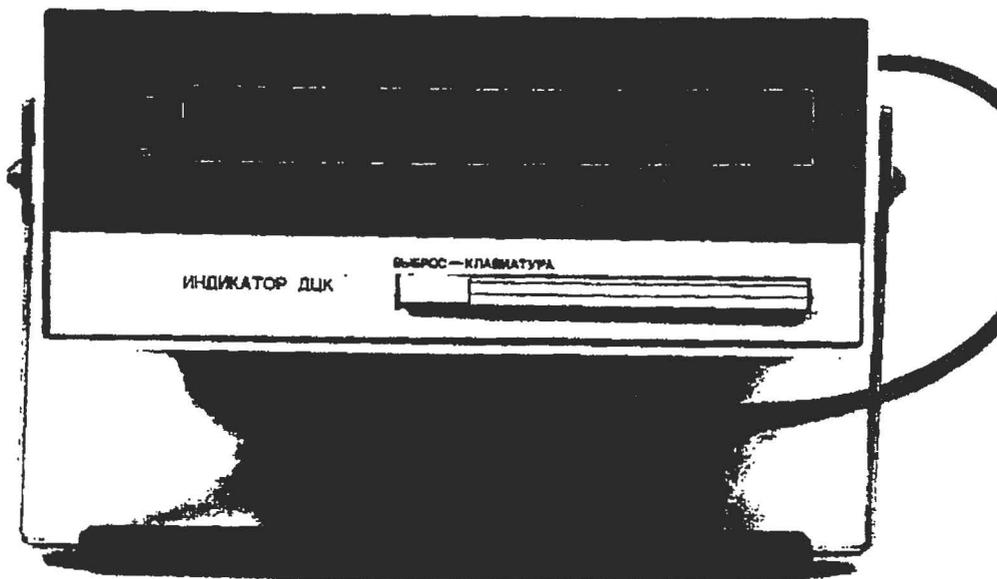
1.5(4)

(U) *Project Status.* Completed.

(U) *Programs Supported.* This exploitation supported AFMIC's Foreign Materiel Exploitation Program's mission to identify foreign medical materiel of possible interest to consumers and to provide technical details on the materiel.

(U) *Value.* This exploitation supports the US Department of Defense medical technology data base.

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(Former) East German Field Detection Laboratory, EFL-F

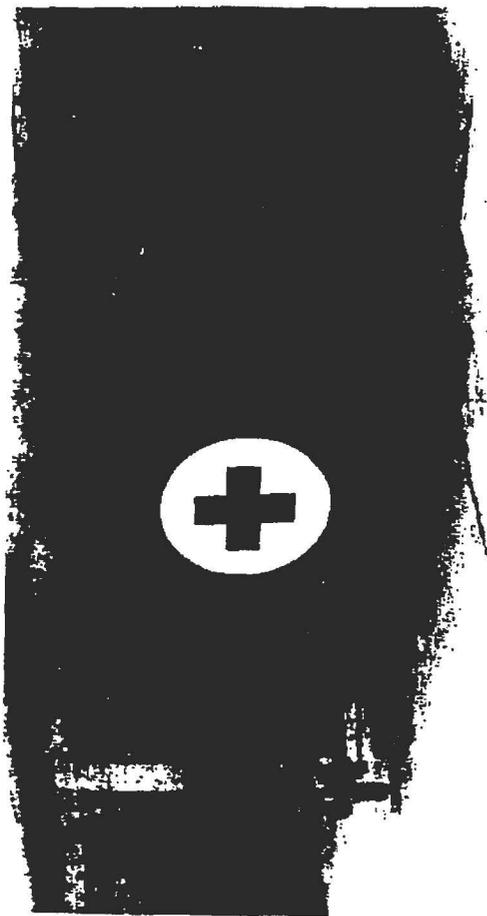
(CONF) Project Description. The US Army Science and Technology Center, Europe, exploited, in Germany, the (former) East German Field Detection Laboratory, EFL-F. The German government allowed access to the laboratory and to former East German military personnel who developed the laboratory. Operating manuals, inventories, descriptions, technical capabilities of the contents, photographs, and interviews of former East German military personnel who developed the laboratory were obtained. (AFMIC 170-91)

(U) Project Status. Completed.

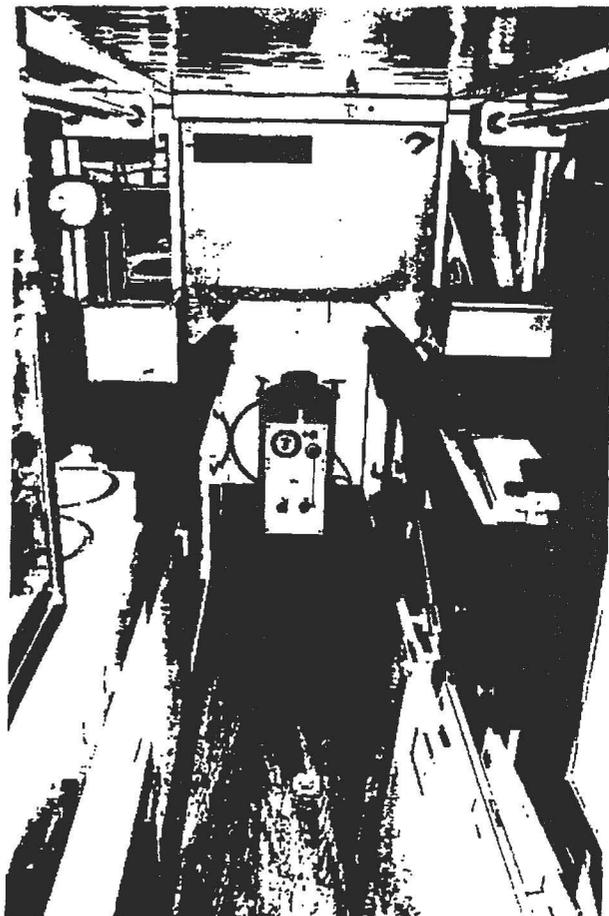
(U) Programs Supported. This exploitation supported AFMIC's mission to assess foreign BW capabilities.

(C) Value. The EFL-F Field Detection Laboratory is designed to identify BW and infectious disease agents. Knowing the reasons this laboratory was planned and developed and the laboratory's capabilities are of major significance to BW analysts in assessing the biological agents that the Warsaw Pact considered a threat.

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Bulgarian Chemical Warfare (CW) Skin Decon/Medical Kit, IZP-3

(CAF) *Project Description.* The Bulgarian CW skin decontamination and medical kit IZP-3 contained an aerosol decontamination spray, two glass ampules, and one plastic syrette. The decontamination spray was a solution of sodium hydroxide in diethylene glycol ethyl ether. Similar solutions are present in some Soviet decontamination kits and are intended for nerve agent decontamination. The ampules contained a mixture of ethanol, diethyl ether, and chloroform. This mixture is present in some Soviet kits and is intended to alleviate eye and respiratory tract irritation. The active components of the syrette were benactyzine, atropine, pethidine, ephedrine, and the oxime TMB-4. This mixture is effective in treating organophosphorus poisoning. (AFMIC 165-91)

18 (C)

(U) *Project Status.* Completed.

(U) *Programs Supported.* This exploitation supports AFMIC's program to assess the CW treatment capabilities of foreign countries. It also supports ICD programs to develop antidotes and other medications for CW agents.

(U) *Value.* Knowing the composition of antidotes and other CW medications used by foreign militaries is of value and supports our technical data base.

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Spanish Burn Ointment

(~~C/NF~~) *Project Description.* ICD and the Armed Forces Radiobiology Research Institute (AFRRI) evaluated the effectiveness of an ointment for treating radiation and chemical burns. The ointment was developed by a Spanish physician. (AFMIC 001-91)

} 1.5(c)

(U) *Project Status.* Completed.

(U) *Programs Supported.* This exploitation supports ICD and AFRRI's programs to develop better treatments for mustard and other chemical burns and for radiation burns.

(U) *Value.* Mustard, other chemical, and radiation burns are not well treated with presently available ointments. An improved ointment would be valuable. Mustard agent was used extensively by Iraq in the Iran-Iraq war. The ointment was not effective.

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Bulgarian Radioprotective Drug

(~~CANF~~) *Project Description.* AFRRI evaluated a substance provided by a Bulgarian scientist, reportedly an effective radioprotectant. The substance was provided in three forms: a powder, a powder with additives, and a tablet. The tablets were made by the German company, Otto Haensel. No manufacturers were associated with the powders. The substance is an extract from mycelium, which composes the vegetative body of many fungi and some bacteria. The principle ingredient is believed to be glucan, a polysaccharide. Glucan does have a mild immune-stimulating effect which would help in treatment of radiation sickness; however, the substance showed no radioprotection. (AFMIC 042-91)

1.5 (C)

(U) *Project Status.* Completed.

(U) *Programs Supported.* This exploitation supports AFRRI's programs to develop more effective radioprotective drugs.

(U) *Value.* Radioprotective drugs have important uses in medicine (such as during radiation treatments) and in occupation safety (such as workers at sites with unusual radiation levels). Effective drugs for these uses would be valuable.

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