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DEPARTMENT OF THE ARMY
UNITED STATES ARMY INTELLIGENCE AND SECURITY COMMAND
FREEDOM OF INFORMATION AND PRIVACY ACT OFFICE
2600 ERNIE PYLE STREET
FORT MEADE, MD 20755-5995

May 19, 2023

Freedom of Information/
Privacy Office

This is in reponse to your Freedom of Information Act (FOIA) request of February 28, 2022, and supplements our letter of March 8, 2022.

We have completed a mandatory declassification review of the INSCOM information in accordance with Executive Order (EO) 13526. As a result of our review, information has been sanitizied that would result in an unwarranted invasion of the privacy rights of the individuals concerned. This information is exempt from the public disclosure provisions of the FOIA pursuant to Title 5 U.S. Code 552 (b)(3) and (b)(6). Exemption (b)(3) pertains to information that is exempt by statute. The applicable statute is 50 U.S.C. § 3024 (i), which protects intelligence sources and methods.

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Commander
U.S. Army Intelligence and Security Command
Freedom of Information/Privacy Office (APPEAL)
2600 Ernie Pyle Street, Room 3S02-B
Fort George G. Meade, Maryland 20755-5910

If you have any questions regarding this action, feel free to contact this office at 1-866-548-5651, or email the INSCOM FOIA office at: usarmy.meade.usacic.mbx.inscom-foia-service-center@army.mil and refer to case #0148F-22. You may contact our FOIA Public Liaison, Ms. Crystle Poge, for any further assistance and to discuss any aspect of your request at 571-515-0306 or at her email address: usarmy.belvoir.hqda-oaaahs.mbx.rmda-foia-public-liaison@army.mil. Additionally, you may contact the Office of Government Information Services (OGIS) at the National Archives and Records Administration to inquire about the FOIA mediation services they offer. The contact information for OGIS is as follows: Office of Government Information Services, National Archives and Records Administration, 8601 Adelphi Road-OGIS, College Park, Maryland 20740-6001, email at ogis@nara.gov, telephone at 202-741-5770; toll free at 1-877-684-6448; or facsimile at 202-741-5769.

Sincerely,

HEATON.MICHAEL.TODD.1160922075

Digitally signed by HEATON.MICHAEL.TODD.1160922075
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Michael T. Heaton
GG-15, Director
Freedom of Information/Privacy Act Office

Enclosure

FSTC-CS-03-06-68

ARMY MATERIEL COMMAND

U S ARMY
FOREIGN SCIENCE AND TECHNOLOGY CENTER

BW PROGRAMS (PROFILE OF PERSONALITIES, INSTITUTIONS, AND ACTIVITIES) — — ASIAN COMMUNIST COUNTRIES (U)

AN ARMY INTELLIGENCE DOCUMENT

~~NO FOREIGN DISSEM~~

FSTC-CS-03-06-68

BW PROGRAMS (PROFILE OF PERSONALITIES, INSTITUTIONS, AND ACTIVITIES) — ASIAN COMMUNIST COUNTRIES (U)

March 1968

(Based on information available as of April 1967)

This product contains agreed Department of the Army Intelligence.

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PREFACE

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~~(C)~~ This study presents a description and an analysis of microbiological scientific and technical research and development activities of the Asian Communist Countries that would be applicable to a BW program. Included are analyses on personalities, facilities, BW agents, weapon systems and munitions, and defensive aspects of BW. The countries covered in this study are Communist China, North Vietnam, and North Korea. The Mongolia People's Republic is not included because of inadequate data. A broad working definition of BW agents and materials was employed in presenting these data as BW-related if the slightest indication existed that the research data could be applied to development of a BW program. The existence of formal BW programs for these countries cannot be currently confirmed or denied because of the difficulty in obtaining valid information.

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BW PROGRAMS (PROFILE OF PERSONALITIES, INSTITUTIONS, AND ACTIVITIES) — ASIAN COMMUNIST COUNTRIES (U)

SUMMARY

(U)
~~(S)~~ COMMUNIST CHINA

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~~(S)~~ Since Chinese Communist scientists are known to be examining the international literature, they are certainly aware of the developments and possibilities regarding BW programs. During the Korean War, the U.S. Armed Forces were subjected to a barrage of propaganda on biological warfare. Chinese Communist scientists and government officials have expressed the belief on many occasions that Communist China should be prepared to defend against BW attack. Although many reports of BW research and development in Communist China have appeared, not one installation has been definitely identified as being engaged in such activities. Installations which have been reported as possible BW facilities include the following: (1) Hainan Agricultural Scientific Research Institute, Hainan Island; (2) Institute of Serums and Vaccines (Changchun Biological Products Center), Changchun; (3) Ta-Lien Biological Center (Dairen Biological Institute), Dairen; (4) Tung Hsien Laboratory, located in the Peking vicinity; (5) Institute for Biological Products Research (Central Biological Products Institute), Peking; and many other unconfirmed biological installations. Most of the information is conflicting, and the differences in the translations of names of these establishments add to the confusion.

(U)
~~(S)~~ Some evidence has indicated that a BW defense program has been incorporated in the Chinese Communist public health program. Public health agencies were directed as far back as 1952 to engage in research on BW defense measures, through universities and research institutes. Other reports in 1951-52 stated that various BW research commissions were established to direct and advise on a BW research program. The Chinese Communist press and radio continue to keep the subject of biological warfare before the public. In addition to the aforementioned suspect BW installations, biological research institutes and universities are engaged in research which would support a BW program. Chinese Communist biological research has been difficult to evaluate for a number of reasons. In addition to the absence of substantive research reports, the variation in competence of the scientists and their work revealed in published research has caused uncertainty in assessing capabilities. In a country which still maintains primitive medicinal procedures, the synthesis of insulin has been reported, and large modern centers for the production of biologicals appear to be available. Thus, highly competent biochemists are involved in research in Communist China, where acupuncture is still a required practice. Despite these inconsistencies, a pattern of gradually evolving competence is evident. Chinese Communist research workers are confronted with enormous public health problems, which are resulting in ever increasing research in microbiology and virology. Good progress has been achieved in the vaccine and antibiotic industry.

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~~(S)~~ Although serious research in aerobiology was apparently not initiated until 1954, considerable progress was noted as early as 1959. At that time, research was reported which indicated that work had been completed involving studies in an aerosol chamber similar to Western types. This development revealed an awareness of the problems in aerobiology which must be studied in obtaining the type of information supportive to any BW research. The various phases of BW research are probably under the direction of the Ministry of Defense, Ministry of Public Health, and the Academy of Medical Sciences. On the basis of information which has been available on Chinese Communist research efforts and the numerous reports relative to BW interests, the supposition can be made that some BW research is underway. The Chinese Communists could produce BW agents and disseminate them, should the occasion warrant such measures. The existence of an adequate national defense posture against BW is doubtful.

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~~(S/NFD)~~ NORTH VIETNAM

(U)

~~(S/NFD)~~ The problems in assessing the status of BW activities and capabilities in North Vietnam are similar to, but more acute than, those presented by Communist China. Scientific and technical microbiological research to support an organized BW program is not in evidence in North Vietnam. Except for small-scale clandestine BW activities, North Vietnam would need extensive aid from other Communist countries to establish an offensive and/or defensive BW posture. Recently captured documents indicate an interest in BW protection, but a lack of equipment has hampered developments. Fundamental research resulting from increased efforts directed toward solving the problems associated with endemic and epidemic diseases could be applicable to the support of a future North Vietnamese capability for defensive and offensive BW.

(U)

~~(C)~~ NORTH KOREA

(U)

~~(C)~~ A lack of information precludes an adequate assessment of BW activities and capabilities in North Korea. One institute in P'yongyang is suspected of conducting BW research. No scientific personalities in microbiology have been identified. Information on possible BW agents is lacking, and an adequate defense posture would be impossible without aid from other Communist countries.

BW PROGRAMS (PROFILE OF PERSONALITIES, INSTITUTIONS, AND ACTIVITIES) — ASIAN COMMUNIST COUNTRIES (U)

Section I. (U) ~~(S/NFD)~~ PERSONALITIES ASSOCIATED WITH BW-RELATED RESEARCH

1. (U) ~~(C)~~ COMMUNIST CHINA

a. (U) ~~(C)~~ Chinese Communist microbiology, public health, and medical science research programs indicate a limited capability for the development of BW agents. The competency of Chinese Communist microbiologists (many are Western trained), and their sound research techniques in virology, support the belief that the Chinese Communists are directing some efforts to BW-agent research and development. In addition, several recent intelligence documents have contained interesting references to possible BW-agent programs.

b. (U) ~~(C)~~ The Chinese Communist practice of exploiting the world literature and the techniques and equipment of other countries would also increase Chinese Communist knowledge and capabilities regarding biological warfare. In early 1966, Communist China issued purchase requests for portable biofermentation units from Sweden; this equipment, normally employed in vaccine production, could also be used for BW-agent development and production.

c. (U) Numerous scientific and technical personnel have been mentioned in Chinese Communist microbiological and BW-related scientific literature. The following list includes a select group of individuals believed capable of conducting research contributory to a BW research and development program. The corresponding reference numbers indicate the original research publication or other document noting the work of the author (see appendix for reference list).

Personality	Facility and interest	Reference
Chang Ch'i-k'ai	Chinese People's Liberation Army (CPLA), Academy of Medical Sciences; CBR research.	1
Chang Hsing-i (1728/5281/5030)*	Changchun Institute of Biologicals, Changchun; infectious ribonucleic acid (RNA) spring-summer encephalitis virus.	2

* International Telegraphic Code Number.

Personality	Facility and interest	Reference
Chang Ju-hsu	Hupeh Branch, Chinese Academy of Medical Sciences; fluorescent antibody staining technique (FAST).	3
Chang Li-pi (1728/4409/3880)	Institute of Virology, Chinese Academy of Medical Sciences, Peking; FAST, Japanese B encephalitis (JBE).	4, 5, 93
Chang Tun-hou (1728/2415/0624)	Biology Teaching and Research Section, Hang-yang Medical College; ecology of encephalitis vector.	77
Chao Hung-chang (6392/3163/3864)	Affiliation unknown; wheat rust disease.	86
Chao Pin (6392/1755)	Institute of Epidemiology and Microbiology, Chinese Academy of Medical Sciences, Peking; FAST detection of Pasteurella pestis.	7
Ch'en Cheng-jen (7115/2973/0088)	Institute of Biological Products, Ministry of Public Health; brucellosis vaccine.	6, 8, 93
Ch'en Hsin-t'ao (7115/1800/7118)	Chungshan Medical College; research on mites and on the mosquitoes that carry malaria and epidemic type B encephalitis.	78
Ch'en Hui-tuan (7115/1920/4551)	Affiliation unknown; weed killing agents.	63
Ch'en Hung-shan (7115/7703/3790)	Institute of Antibiotics, Chinese Academy of Medical Sciences, Peking; antivirulent drugs, culture of cowpox and fowl plague viruses.	64
Ch'en Li-te (7115/4539/1795)	Institute of Virology, Chinese Academy of Medical Sciences, Peking; JBE immunization.	9
Ch'en P.	Affiliation unknown; JBE.	81
Ch'en Po-ch'uan (7115/0130/2938)	Institute of Virology, Chinese Academy of Medical Sciences, Peking; JBE virus.	6, 10, 11, 12
Ch'en Shen	Institute of Microbiology, Chinese Academy of Sciences, Peking; bacteriophage.	62
Cheng Hou-ching (6774/0624/2468)	Department of Veterinary Sciences, Peking Agricultural University, Peking; brucellosis immunization.	13, 14

Personality	Facility and interest	Reference
Cheng Pin-yun (6774/2430/0061)	Institute of Virology, Chinese Academy of Medical Sciences, Peking; FAST.	4
Chia Ming-ho (6328/2494/0735)	Institute of Epidemiology and Microbiology, Chinese Academy of Medical Sciences, Peking; FAST detection of Pasteurella pestis.	7
Chiang Ching-i (5592/2529/0308)	Institute of Antibiotics, Chinese Academy of Medical Sciences, Peking; antivirulent drugs, culture of cowpox and fowl plague viruses.	64
Chiang Hsiang-chun (5592/3275/0689)	Institute of Pharmacology, Chinese Academy of Medical Sciences, Peking; antivirulent drugs.	15, 16
Chien Hsin-chung (6929/0207/1813)	Minister of Public Health; major diseases of the military, CBR.	17, 67
Chin Shan-pao (6855/0810/1405)	Affiliation unknown; wheat rust disease.	85
Ching P'ei (2529/3099)	Institute of Biochemistry, Chinese Academy of Sciences, Shanghai; plaque mutant of bacteriophage ϕX174.	18
Chou Ming-chen (0719/1380/3791)	Biological Products Institute, Ministry of Public Health, Peking; JBE vaccine.	19
Chou Ming-hsien (0719/2494/0341)	Institute of Virology, Chinese Academy of Medical Sciences, Peking; JBE immunization.	9, 93
Chu Chi-ming (2621/2478/2494)	Changchun Research Institute of Biologicals, Changchun; spring-summer encephalitis.	6, 87, 93
Chu Hui-chen (2612/1920/3791)	Epidemiology and Microbiology Institute, Chinese Academy of Sciences, Peking; Brucella.	20
Chu Ts'ui-li (2612/3231/4350)	Affiliation unknown; weed-killing agents.	63
Fan Jui-lien (5400/3843/5571)	Institute of Virology, Chinese Academy of Medical Sciences; JBE virus.	11, 12, 75, 81
Fang Hsin-fang (2455/1800/5364)	Vice Chairman, China Microbiology Society, Dir. Institute of Microbiology, Chinese Academy of Sciences; interest unknown.	6, 93

Personality	Facility and interest	Reference
Fang Jui-ying (2455/3843/5391)	Chekiang Medical University, Hangchow; JBE drugs.	24
Fang Shu-ying	Chekiang Medical College, Hangchow; JBE virus drugs.	25
Han Hung-lin (7281/7703/7207)	Biological Products Institute, Ministry of Public Health; Clostridium botulinum type E toxin.	6, 82, 88
Hang Ch'ang-shou (2635/7022/1108)	Institute of Virology, Chinese Academy of Medical Sciences, Peking; JBE virus.	26, 27
Ho Nan-hsiang (0149/0589/4382)	Institute of Microbiology, Chekiang Academy of Medical Sciences, Hangchow; Rickettsia orientalis infection.	58
Hsiang Chin-min (0686/6602/2404)	Affiliation unknown; viral interference and interferon.	28, 93
Hsing Tsu-p'ei (6717/4371/1014)	Affiliation unknown; survival studies of lyophilized Rickettsia orientalis.	29, 93
Hsu Chao-hsiang (6079/0340/4392)	Institute of Virology, Chinese Academy of Medical Sciences, Peking; JBE virus, immunization.	6, 9, 10, 11, 12, 75, 81, 93
Hsu Hai-feng (1776/3189/1496)	Affiliation unknown; lapinized hog-cholera vaccine.	89
Hu Chi-ch'eng (5170/0679/2052)	Head, Disease Laboratory, Institute of Plant Protection, Kirin Academy of Agricultural Sciences, Peking; black rot.	79
Hu Ching-liang (5170/4552/5328)	Affiliation unknown; cotton disease.	85
Huang Chen-hsiang (7806/4394/4382)	Institute of Virology, Chinese Academy of Medical Sciences, Peking; JBE.	6, 26, 27, 30, 31, 76, 80, 90, 93
Huang Liang (7806/6852)	Institute of Pharmacology, Chinese Academy of Medical Sciences, Peking; antiviral compounds.	15, 16, 61
Huang S. H.	Affiliation unknown; JBE.	32
Kao Shang-yin (7559/1424/5593)	Vice-Chairman, China Microbiological Society; viruses, bacteriophage.	21, 33, 34, 93
Ku Fang-chou (7357/2455/5297)	Department of Virology, Chinese Academy of Medical Sciences, Peking; JBE virus.	6, 35, 93

Personality	Facility and interest	Reference
Ku Hsiang-pao (6665/4382/6283)	Affiliation unknown; Bacillus anthracis.	36
Ku P'ei-wei (7357/0160/7279)	Biological Products Institute, Ministry of Public Health, Peking; JBE virus vaccine, interferon.	19, 37
Kuan Te (4619/1795)	Affiliation unknown; Bacillus anthracis.	36
Kuo Chang-kai (6753/4545/3346)	Epidemiology and Microbiology Institute, Chinese Academy of Sciences, Peking; Brucella.	20
Kuo Hui-ying (6753/1979/5391)	Institute of Biochemistry, Chinese Academy of Sciences, Shanghai; plaque mutant of bacteriophage ΦX174.	18
Kuo Hui-yu (6753/6540/3768)	Sun Yatsen Medical College, Canton; Newcastle disease virus, tissue culture of JBE virus.	38, 74, 93
Li Ch'eng-tung (2621/2052/2767)	Institute of Plant Protection, Kirin Academy of Agricultural Sciences, Peking; research on rice blast.	79
Li Huan-lou (2621/3562/2869)	Institute of Antibiotics, Chinese Academy of Medical Sciences, Peking; bacterial genetics.	59
Li Kuang (2621/3171)	Institute of Microbiology, Chekiang Academy of Medical Sciences, Hangchow; Rickettsia orientalis infection.	58
Li Kuang-ti (2621/0342/0966)	Institute of Biochemistry, Chinese Academy of Sciences, Shanghai; plaque mutant of bacteriophage ΦX174.	18
Li Kung-te (2621/0361/1795)	Deputy Director, Institute of Crop Breeding and Cultivation, Kirin Provincial Academy of Agricultural Sciences, Peking; directing research on improved strains of cereal grains and corn varieties.	79
Li Liang-shou (2621/5328/1108)	Affiliation unknown; Bacillus anthracis.	36
Li Mei-jung (2621/5019/1369)	Biological Products Institute, Ministry of Public Health, Peking; JBE vaccine.	19, 39

Personality	Facility and interest	Reference
Li Shen-te (2621/3947/1795)	Institute of Epidemiology and Microbiology, Chinese Academy of Medical Sciences, Peking; tick-borne encephalitis (TBE).	40
Li Tsai-p'ing (2621/6528/1627)	Institute of Biochemistry, Chinese Academy of Sciences, Shanghai; plaque mutant of bacteriophage ΦX174.	18
Li Yuan-yuan (2692/0337/0337)	Department of Virology, Chinese Academy of Medical Sciences; JBE virus.	75
Liu Chin-t'ang (0491/6930/2768)	Affiliation unknown; FAST.	3
Liu Ching-hua (0491/2529/5478)	CPLA, Veterinary University of China; Pasteurella.	41
Liu Hua-ch'en (2692/5363/2525)	Institute of Virology, Chinese Academy of Medical Sciences, Peking; infectious RNA of JBE virus.	42, 43
Liu Te-cheng (0491/1795/6927)	Institute of Biological Products, Ministry of Public Health; brucellosis vaccine.	6, 8, 93
Liu Yuan-yuan (2692/0337/0337)	Institute of Virology, Chinese Academy of Medical Sciences, Peking; JBE virus and its infectious RNA.	6, 10, 11, 12, 42, 43, 81, 93
Lo Chung-yu (5012/0112/1946)	Department of Veterinary Sciences, Peking Agricultural University, Peking; brucellosis immunization.	13, 14
Lo K.	Affiliation unknown; Bacillus thuringiensis var. thuringiensis I.	84
Lu Shih-liang (7120/1102/5328)	Institute of Biological Products; Ministry of Public Health; brucellosis vaccine.	6, 8, 93
Lu Te-ju (7120/1795/1172)	Institute of Microbiology, Chinese Academy of Sciences, Peking; bacteriophage.	62
Ma Wen-hsin (7456/2429/0207)	Cheng-tu Biological Products Institute; JBE.	19
Ma Yao (7456/3852)	Institute of Microbiology, Chekiang Academy of Medical Sciences, Hangchow; Rickettsia orientalis infection.	58

Personality	Facility and interest	Reference
Mao Chiang-sen (3039/3068/2773)	Institute of Virology, Chinese Academy of Medical Sciences, Peking; JBE virus and its infectious RNA.	6, 26, 27
Min Yu-nung (7036/1635/6593)	General Microbiology and Research Section, Department of Plant Protection, Peking Agricultural University, Peking; pathogenic fungi (Fusarium species).	60
Pai Ch'ang-le (4101/1603/2867)	Institute of Epidemiology and Microbiology, Chinese Academy of Medical Sciences; FAST detection of Pasteurella pestis.	7
Pai Feng (4101/1496)	Inner Mongolia Institute of Contagious Diseases; TBE.	40
Pai Shih-en (4101/2457/1869)	Sun Yatsen Medical College, Canton; Newcastle disease virus.	38
P'an Jen-chiang (3382/1103/1203)	Affiliation unknown; Clostridium botulinum type E toxin.	6, 82
P'ang Ch'i-fang (7894/0366/2455)	Institute of Virology, Chinese Academy of Medical Sciences, Peking; FAST, JBE.	4, 5
Pao Nai-to (7637/0035/6995)	Affiliation unknown; weed killing agents.	63
Pien Ju-lien	Chekiang Medical College, Hangchow; JBE virus drugs.	24, 25
Pu Yun-lung (0592/7189/7893)	Yunan Animal Husbandry and Veterinary Science Research Institute; foot-and-mouth disease.	51
Shen San-lo (3947/0005/2867)	Institute of Epidemiology and Microbiology, Chinese Academy of Medical Sciences, Peking; TBE.	40
Sun Mien (1327/0517)	Biological Products Institute, Ministry of Public Health, Peking; JBE vaccine, interferon.	19, 37
Sun Sheng-hao (1327/4141/6275)	Cheng-tu Biological Products Institute; JBE vaccine.	19
T'ang T'eng-han (3282/7506/3352)	CPLA Academy of Medical Sciences, Shanghai; CBR research.	1
T'ang Yu-shu (0781/3768/2579)	Institute of Vaccine and Serum, Changshun; spring-summer TBE.	87

Personality	Facility and interest	Reference
Ting Ying (0002/4481)	Affiliation unknown; rice expert.	85
Ts'ai Hsu (5591/2485)	Affiliation unknown; wheat rust.	85
Ts'ao Shu-tse (2580/3412/3419)	Peking Agricultural University, Peking; brucellosis immunization.	14
Tseng Shih-mai	Plant Protection Department, Peking Agricultural University; dispersal distance studies on stripe rust of wheat.	73
Tsou Lien-chih (6760/5571/5347)	Changchun Institute of Biologicals, Changchun; infectious RNA of spring-summer encephalitis virus.	2
Tuang H.	Affiliation unknown; JBE.	83
Wang Cheng-huai	Affiliation unknown; vaccines and serums.	44
Wang Chin (3076/3866)	Department of Virology, Chinese Academy of Medical Sciences, multiplication of JBE.	76, 80, 90
Wang Huan-ju (3769/3562/1172)	Affiliation unknown; wheat rust disease.	86
Wang K'o-ning (3076/0668/1337)	Institute of Plant Protection Research, Chinese Academy of Agricultural Sciences; wheat rust.	45
Wang Lin (3769/3829)	Institute of Pharmacology, Chinese Academy of Medical Sciences; antiviral compounds.	15, 16, 61
Wang S.	Affiliation unknown; JBE virus.	32
Wang Shu-sheng (3769/2885/5116)	Institute of Virology, Chinese Academy of Medical Sciences, Peking; JBE virus.	31
Wang T'ing-chih (3769/1656/1807)	Changchun Institute of Biologicals, Changchun; infectious RNA of spring-summer encephalitis virus.	2
Wang Y.	Affiliation unknown; Bacillus thuringiensis var. thuringiensis I.	84
Wang Yung-chi (3769/3938/2813)	Biological Products Institute, Ministry of Public Health, Peking; JBE virus vaccine, interferon.	19, 37, 39

Personality	Facility and interest	Reference
Wei Nai-sen	Affiliation unknown; botulinum toxin.	91
Wen Hao-tian	Affiliation unknown; botulinum toxin.	91
Wu Hsiang-fu (0702/4382/3940)	Institute of Biochemistry, Chinese Academy of Sciences, Shanghai; plaque mutant of bacteriophage ΦX 174.	18
Wu Yuan-liu (0702/0337/9497)	Institute of Pharmacology, Chinese Academy of Medical Sciences, Peking; antiviral compounds.	15, 16
Yang Chung-ch'i (2799/6945/4388)	Biochemistry Laboratory, Institute of Vaccine and Serum, Changchun; Pasteurella pestis EV strain.	92
Yang Pao-chu	Chekiang Medical College, Hangchow; JBE virus drugs.	24, 25
Yen Yung-k'ai (0917/6102/2818)	Sun Yatsen Medical College, Canton; Newcastle disease virus.	38
Yu Ch'i-pao (0205/0796/5508)	Affiliation unknown; cotton disease.	85
Yu En-shu (0060/1869/1659)	Fukien Province Institute of Epidemiology, Foochow; detection of Coxiella burnetii.	47, 65, 93
Yun Chao-ch'uan (1926/5128/2938)	Epidemiology and Microbiology Institute, Chinese Academy of Sciences, Peking; Brucella.	20
Zheng Ming-pan	Affiliation unknown; botulinum toxin.	91

(U)
2. ~~(S/NFD)~~ NORTH VIETNAM

(U)
a. ~~(C)~~ Inadequate facilities and insufficient numbers of trained personnel preclude a large-scale BW research and development program in North Vietnam. Furthermore, indications are that the initiatory North Vietnamese microbiological research will not advance sufficiently to support a BW capability in the near future. Like Communist China in the early scientific development stages, North Vietnam is attempting to promote overseas training of nationals to increase its scientific resources. The North Vietnamese have experienced only limited scientific and technical advances in the past 6 to 7 years, but possibilities and capabilities do exist for various types of small-scale clandestine BW activities. Many official and unofficial propaganda statements have been a part of the current Vietnamese conflict; therefore, the possibility cannot be ignored that the North Vietnamese will develop a BW program in retaliation for the defoliation conducted against them.

(U)

b. ~~(S/NFD)~~ Information concerning microbiological research personnel in North Vietnam is practically nonexistent; for this reason, the personalities listed below can be considered only as possible BW researchers.

(U)

(1) ~~(S/NFD)~~ Dr. Dang Duc Trach, a serologist-bacteriologist, was Minister of Health and affiliated with the Pasteur Institute, Hanoi, in 1963.

(U)

(2) ~~(S/NFD)~~ Dr. Hoang Thuy Nguyen was affiliated with the Pasteur Institute in 1963. He has not been further identified.

(U)

(3) ~~(S/NFD)~~ Dang Van Nguc is the director of the Institute of Malaria, Parasitology, and Entomology; he is also a member of the Central Executive Committee and Technological Subcommittee, Vietnam Medical Association. Dang Van Nguc is a research director at the College of Medicine and Pharmacy of the People's University of Vietnam. He is an outstanding personality in medical research and is currently working on a plan to eliminate malaria. He produced the first Vietnamese penicillin.

(U)

(4) ~~(S/NFD)~~ Nguyen Duc Khoi served as director of the Microbiological Institute of the Ministry of Health and of the Hanoi Municipal Public Health Service (1955-56). He is a member of the Preventive Medicine Association of North Vietnam and has engaged in bacteriological research since 1951, specializing in parasitology, especially Leptospira.

(U)

(5) ~~(S/NFD)~~ Pham Ngoc Thach is the current Minister of Health (1967).

(U)

(6) ~~(S/NFD)~~ Vu Van Can has been Vice Minister of Health since 1960. As a Senior Colonel, he has served as Chief of the Military Medical Bureau, Vietnam People's Army, since 1950. He is reportedly a member of the Vietnamese Medical Association.

(U)

(7) ~~(S/NFD)~~ Dr. An is currently head of the Medical Bureau and deputy chief of the Army Rear Service General Bureau.

(U)

3. ~~(C)~~ NORTH KOREA

(U)

a. ~~(C)~~ An assessment of a BW research and development program in North Korea is not possible because of the lack of sufficient data. BW activities in that country during the Korean War were conducted on a limited scale, and only one facility, the Bacterial Institute of North Korea, Pyongyang, was alleged to be conducting BW research during World War II. Investigation by a team of U.S. microbiologists failed to confirm any BW research and development activities.

b. (U) Individuals associated with BW-related research have not been identified in North Korea.

(U)
Section II. ~~(S/NFD)~~ FACILITIES ASSOCIATED WITH BW-RELATED RESEARCH

4. (U) COMMUNIST CHINA

The following list of Chinese Communist facilities performing work with BW-related applications is based on microbiological research and development information on public health facilities, universities, and military institutes. Wherever possible, facilities have been categorized as to major field of interest. The reference number indicates the bibliographic source found in the reference list (see appendix).

Facility and category	Staff	Reference
Biological Materials Factory, Changchun; BW materials for Soviet-Chinese Communist military use.	Unknown	94, 97
Biological Materials Factory, Chungking; cultivation of BW materials.	Unknown	94, 97
Biological Agents Factory, Kungchou; cultivation of BW agents.	Unknown	94
Biological Materials Factory, Wuhan; cultivation of BW materials, antibiotics.	Unknown	94, 96, 97
Canton Biological Material Factory, Canton; cultivation of BW agents.	Unknown	92, 97
Central Bureau of Biology Inspection, Peking; possible BW research.	Unknown	94
Changchun Germ Station, Changchun; possible BW research.	Unknown	95
Changchun Research Institute of Biologicals, Changchun; infectious RNA of spring-summer encephalitis virus; JBE virus.	Chang Hsing-i (1728/5281/5030) Chu Chi-ming (2621/2478/2494) Chu Chu-jen (5969/5468/0088) Tsou Lien-chih (6760/5571/5347) Wang T'ing-chih (3769/1656/1807)	2
Che-chiang Chin-hua Pharmaceutical Plant, Chin-hua, Che-chiang Province; antibacterial pharmaceuticals.	Unknown	96

Facility and category	Staff	Reference
Chekiang Academy of Medical Sciences, Hangchow; JBE virus drugs, Rickettsia orientalis infection.	Fang Jui-ying (2455/3843/5391) Fang Shu-ying Ho Nan-hsiang (0149/0589/4382) Li Kuang (2621/3171) Pien Ju-lien Yang Ling-chao (2799/7325/2156) Yang Pao-chu	24, 25, 58
Chengtu Biological Products Institute, Chengtu; JBE vaccines.	Ma Wen-hsin (7456/2429/0207) Sun Sheng-hao (1327/4141/6275)	19
Chinese Academy of Agricultural Sciences, Institute of Plant Protection Research, Kiangsu; wheat rust, mosaic virus disease.	Wang K'o-ning (3076/0668/1337)	45, 47
Chinese Academy of Medical Sciences, Institute of Antibiotics, Peking; antibiotics.	Ch'en Hung-shan (7115/7703/3790) Chiang Ching-i (5592/2529/0308) Li Huan-lou (2621/3562/2869)	59, 64
Chinese Academy of Medical Sciences, Institute of Biologicals, Ministry of Public Health and Medicine Bureau of Ministry of Chemical Industry, Shanghai; medical research related to CBR.	Lt. Gen. Ch'ien Hsin-chung (6929/0207/1813)	17, 67
Chinese Academy of Medical Sciences, Institute of Epidemiology and Microbiology, Peking; Brucella, TBE, FAST (Pasteurella pestis).	Chang Chien-lin (1728/6015/7792) Chang Shuin-chiuo (1203/7311/3061) Chao Pin (6392/1755) Chia Ming-ho (6328/2494/0735)	6, 7, 20, 40

Facility and category	Staff	Reference
Chinese Academy of Medical Sciences, Institute of Epidemiology and Microbiology, Peking (Continued).	Chu Hui-chen (2612/1920/3791)	
	Kuo Chang-kai (6753/4545/3346)	
	Li Shen-te (2621/3947/1795)	
	Lu Hsiu-chih (0172/4423/5347)	
	Pai Ch'ang-le (4101/1603/2867)	
	Shen San-lo (3947/0006/2867)	
	Tsui Ch'un-huai (1508/2504/2849)	
	Wang Ch'uang-hsi (3769/1643/4406)	
	Yun Chao-ch'uan (1926/5128/2938)	
Chinese Academy of Medical Sciences, Institute of Pharmacology, Peking; therapeutic drugs.	Chiang Hsiang-chun (5592/3276/0689)	15, 16
	Huang Hsiung (7806/7160)	
	Huang Liang (7806/6852)	
	Wang Lin (3769/3829)	
	Wu Yuan-liu (0702/0337/9497)	
Chinese Academy of Medical Sciences, Institute of Virology, Peking; JBE virus, infectious RNA of JBE, FAST.	Chang Li-pi (1728/4409/3880)	4, 5, 6, 9, 10, 11, 26, 27, 30, 31, 35, 42, 43, 93
	Chen Li-te (7115/4539/1795)	
	Chen Po-ch'uan (7115/0130/2938)	
	Cheng Pin-yun (6774/2430/0061)	

Facility and category	Staff	Reference
Chinese Academy of Medical Sciences, Institute of Virology, Peking (Continued).	Chou Ming-hsien (0719/2494/0341)	
	Fan Jui-lien (5400/3843/5571)	
	Hong Ch'ang-shou (2635/7022/1108)	
	Hsiang Chin-min (0686/6602/2404)	
	Hsu Chao-hsiang (6079/0340/4392)	
	Huang Chen-hsiang (7806/4394/4382)	
	Ku Fang-chou (7357/2455/5297)	
	Kuo K'o-chien (6753/0668/6190)	
	Liu Hao-chen (2692/5363/2525)	
	Liu Yuan-yuan (2692/0337/0337)	
	Mao Chiang-sen (3029/3068/2773)	
	P'ang Ch'i-fang (7894/0366/2455)	
	Wang Shu-sheng (3769/2885/5116)	
Chinese Academy of Sciences, East China Institute of Entomology; studies on the resistance of mosquitoes to insecticides.	Liu Chin-fa (0491/6855/4099)	69
	Liu Wei-te (0491/4850/1795)	
Chinese Academy of Sciences, Institute of Biochemistry, Shanghai; plaque mutant of bacteriophage ΦX174.	Ching P'ei (2529/3099)	18
	Kuo Hui-ying (6753/1979/5391)	
	Li Kuang-ti (2621/0342/0966)	

Facility and category	Staff	Reference
Chinese Academy of Sciences, Institute of Biochemistry, Shanghai (Continued).	Li Tsai-p'ing (2621/6528/1627)	
	Wu Hsiang-fu (0702/4382/3940)	
Chinese Academy of Sciences, Institute of Microbiology, Shanghai; antibiotics.	Fang Hsin-fang (2455/1800/5364)	21, 22, 23, 93
Chungchun Germ Station; possible BW research.	Unknown	97
Chungshan Medical Institute, Canton; snake venoms, antidotes, tissue culture of Rickettsia tsutsugamushi.	Feng Hui-min	98
	Lo Jui-hsian	
	Dir.-Prof. Ko Ling (2688/7791)	
	Vice Dir.-Prof. Liang (2733)	
	Pai Shih-en (4101/2457/1869)	
CPLA Academy of Medical Sciences, Shanghai; CBR warfare research.	Chang Ch'i-k'ai	1
	T'ang T'eng-han (3282/7506/3352)	
Fukien Province Institute of Epidemiology, Foochow; Coxiella burnetii detection.	Yu En-shu (0060/1869/1659)	46, 65
Germ Research Group, Peking; BW theories, intelligence information.	Unknown	95, 97
Hau-pei Pharmaceutical Plant, Hau-pei; antibiotics.	Unknown	52
Inner Mongolia Institute of Contagious Diseases; TBE.	Pai Feng (4101/1496)	40
Institute of Applied Mycology, Department of Biological Sciences, Peking; biodeterioration research with possible BW applications.	T'ung Ti-Chou	72
Institute of Microbiology, Chinese Academy of Sciences; biodeterioration research.	Lu Rhen-hao	72
Institute of Scientific and Technical Information of China (The Library), Peking; biodeterioration research.	Wang Jo-Leng	72

Facility and category	Staff	Reference
Kuei-yang Pharmaceutical Plant, Kuei-yang; antibacterial pharmaceuticals.	Unknown	96
Lanchow Biological Materials Factory, Lanchow; cultivation of BW agents and veterinary vaccines and sera.	Unknown	97, 99
Mask Plant, Lu-hsien; protective masks.	Unknown	95, 97
Ming-hsing Combined Pharmaceutical Plant, Kuang-chou; antibiotics.	Unknown	96
Ministry of Building Engineering, Research Institute for Building Sciences, Anhwei Province; air filters.	Unknown	49, 50
Ministry of Public Health, Institute of Biological Products, Peking; JBE, interferon, brucellosis vaccine.	Chien Hsin-chung Minister of Public Health Ch'en Cheng-jen (7115/2973/0088) Chou Ming-chen (0719/1380/3791) Ku Pei-wei (7357/0160/7279) Li Mei-jung (2621/5019/1369) Lin Nan-ching (2651/0589/7231) Liu Te-cheng (0491/1795/6927) Lu Shih-liang (7120/1102/5328) Sun Mien (1327/0517) T'ien Shu-ling (3944/3219/3781) Wang Tai-chiang (3769/1132/3068)	8, 17, 19, 37, 39, 93
Munitions Plant, Shen-yang; protective masks.	Unknown	95

Facility and category	Staff	Reference
Nanching Germ Station, Nanching; possible BW research.	Unknown	6, 95, 97
Nanching Pharmaceutical Plant (state operated), Nanching; manufacturer of disinfectant and sterilizer, antibiotics.	Unknown	54, 55, 96
National Control Institute of Pharmaceutical and Biological Products, Peking; penicillin assays, endotoxin resistance; Clostridium botulinum type E.	Chao Chien-hsi (6392/1696/6007) Cheng Chian-liang (6774/2490/0081) Han Hung-lin (7281/7703/7207) Pan Jen-chiang (3382/1103/1203) Tien Shu-ling (3944/3219/3781)	6
National Vaccine and Serum Institute, Peking; measles vaccine, A_1 and A_2 influenza virus, antigenic properties of Streptococcus, Brucella vaccine immunity studies.	Chang Yu-chin Chen Cheng-jen (7115/2973/0088) Chen Wei-lin Liang Yung-ken Liu Chun-hsiang Liu Te-cheng Lu Shih-liang (7120/1102/5328)	6
Northeast No. 6 Pharmaceutical Plant, Shen-yang (state operated); antibiotics, antimalarial pharmaceuticals.	Unknown	96
Pao-ting Pharmaceutical Plant, Pao-ting, Ho-pei Province; manufacturer of disinfectant and sterilizer.	Unknown	96
Peking Agricultural University, Department of Plant Protection, Peking; entomology, phytopathology, and agricultural microbiology disease and insect-resistant plants; insecticides, pathogenic fungi.	Min Yu-nung (7036/1635/6593) Yu Ta-fu (0358/1129/4811)	60, 70, 71

Facility and category	Staff	Reference
Peking Agricultural University, Department of Veterinary Sciences, Peking; brucellosis immunization.	Cheng Hou-ching (6774/0624/2468) Lo Chung-yu (5012/0112/1946) Ts'ao Shu-tse (2580/3412/3419)	13, 14
Peking Biological Agents Factory, Peking; biological agent cultivation, possibly for BW.	Unknown	48, 94, 97
Peking Medical College, Peking; vaccines and antibiotics, Staphylococcus aureus, etc.	Li Chia-t'ai (2621/1367/3141)	49
Peng-pu Insulating Materials Plant, Anhwei Province; air filters.	Unknown	49, 50
People's Liberation Army, Veterinary University of China; Pasteurella.	Liu Ching-hua (0491/2529/5478)	41
Pharmaceutical Plant, Taiyuan (N. China); penicillin and other antibiotics.	Unknown	52
Second Shanghai Military Medical College, Shanghai; antibiotics, medical research related to CBR.	Ch'iu Ch'ung-shan Huang Jung (7806/2837) Huang Ming-chu (7806/7686/7467) Lan Hung-t'ai (5663/7703/3151) Sun Yueh-lu (1327/2588/3873) Tu Shih-chung (1458/0013/1813)	17
Shanghai Biological Material Factory, Shanghai; cultivation of BW agents.	Unknown	48, 94
Shanghai No. 3 Pharmaceutical Plant (state operated), Shanghai; antibiotics.	Unknown	56, 57, 96
Shang Tu Biological Warfare Agents Factory, Ha-erh-pin; plaque bacteria, possible other BW research.	Unknown	94, 95, 97

Facility and category	Staff	Reference
Shansi Medical College, Department of Bacteriology, Taiyuan; category unknown.	Wang Yen-kuei (3769/6056/6311)	6
Shen-yang Biological Agents Factory, Shen-yang; cultivation of BW agents.	Unknown	94
Sun Yatsen Medical College, Canton; Newcastle disease virus.	Kuo Hui-yu (6753/6540/3768)	4
	Pai Shih-en (4101/2457/3768)	
	Yen Yung-k'ai (0917/6102/2818)	
Talien Biological Materials Factory, Talien; cultivation of BW agents.	Unknown	97
Tien-ching-shih P'o-hai Pharmaceutical Plant, Tien-ching; antibiotics.	Unknown	96
Yen-an Si-shan Germ Experimental Factory, Yen-an; BW materials research (including weapons); capable of producing BW bombs, spray guns, artillery shells, grenades, and other spray devices.	Unknown	94, 97
Yunnan Animal Husbandry and Veterinary Science Research Institute, Kunming; drugs, foot-and-mouth disease, cultivation of BW materials.	Pu Yun-lung, Dir. (0592/7189/7893)	51, 53, 97

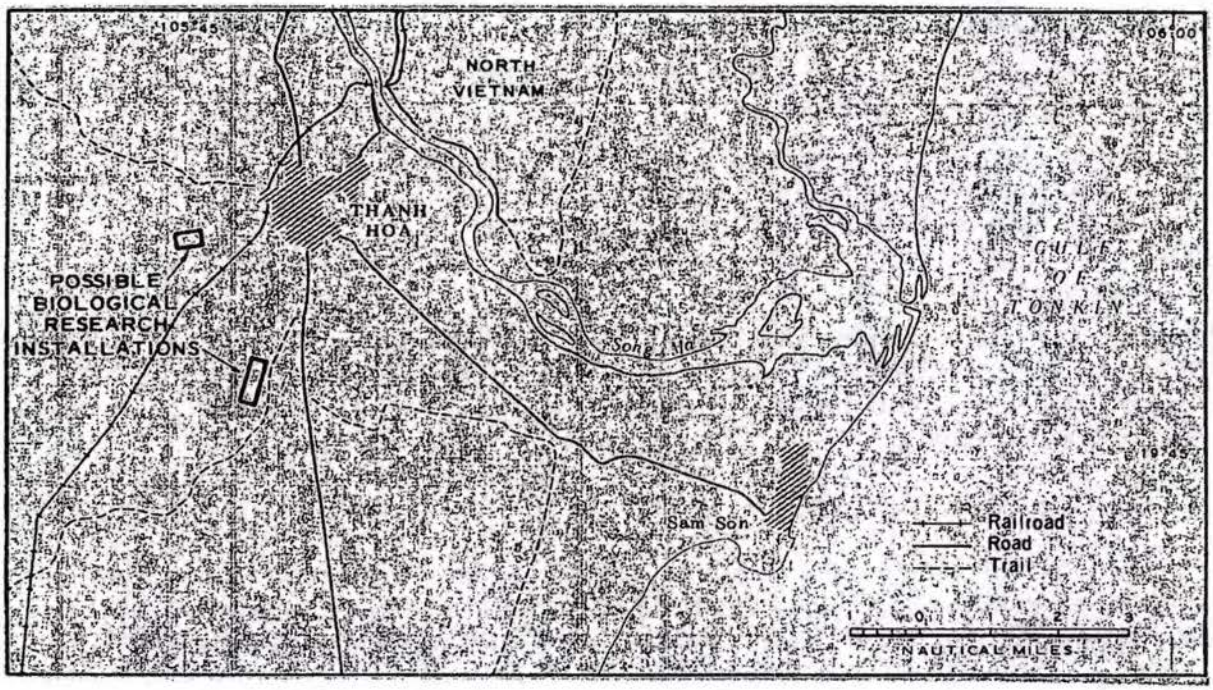
(U)
5. ~~(S/NFD)~~ NORTH VIETNAM

(U)
a. ~~(C)~~ The former autonomous "Institut Pasteur de Vietnam" (now known as the Hygiene and Epidemiology Institute), Hanoi, at one time included the Institut de Saigon, the Institut de Dalat, and the Institut de Nhatrang. At the Saigon institute, research was conducted on melioidosis and certain enteroviruses and arboviruses. At Dalat, human vaccines against cholera and typhus and a living antiplague vaccine were prepared. The institute at Nhatrang specialized in the development of veterinary preparations and also produced antidiphtheria and antitetanus sera and toxins. The director general of the Institut Pasteur de Vietnam was Doctor Nguyen Van Ai, a graduate of the Paris Institute. He has collaborated with Prof. Jacques Fournier of the Service Peste (Plague Service) of the Institut Pasteur, Paris. Prof. Fournier, an authority on melioidosis, has achieved considerable epidemiological and microbial research experience in Vietnam. The Hygiene and Epidemiology Institute at Hanoi probably conducts research similar to the aforementioned facilities that branched from it. This institute,

created in North Vietnam by the merging of the Hygiene Institute and the Bacteriologic Institute, has four primary tasks: (1) to improve hygiene conditions for different ages, sexes, and occupations; (2) to conduct research on microorganisms; (3) to prevent and combat epidemics; and (4) to train epidemiology and hygiene workers. Some elementary BW research and development might be conducted here.

(U)

b. ~~(S/NFE)~~ Two installations near Thanh Hoa in North Vietnam that were suspected of being associated with biological research (fig. 1) have been destroyed by bombings. One was located approximately 1 nm. west-southwest of Thanh Hoa (19°48' N., 105°45' E.); the second installation was located 2 nm. south of Thanh Hoa (19°46' N., 105°46' E.). It is not known if attempts have been made to reconstruct these facilities.



(U)

Figure 1 ~~(S/NFE)~~. Location map of possible North Vietnamese biological research installations, which were destroyed by bombings ~~(S)~~.(U)

(U)

c. ~~(S/NFD)~~ The Ministry of Public Health operates two research institutes: the Antimalaria Research Institute (Chief, Dang Van Ngu) and the Microbiology Institute (Chief, Nguyen Due Khoi). The level, competence, and degree of actual research conducted has not been defined and is therefore considered to be on a limited basis.

(U)
d. ~~(S/NFD)~~ Aid from Communist countries after 1954 has consisted primarily of material support and assistance in the reconstruction and expansion of hospital facilities. The majority of foreign aid has been contributed by the Soviet Union; that country issued refrigerators, hospital instruments, and ambulances and constructed the Vietnam-Soviet Friendship Hospital in Hanoi around the previously established Don-Thuy Hospital. East Germany, Czechoslovakia, Poland, Bulgaria, Hungary, and Communist China have also contributed varying amounts of aid to North Vietnam.

(U)
6. ~~(S)~~ NORTH KOREA

a. The Bacteriological Research Center of the Medical Science Research Institute, located in Tangsang-Dong Mangyongdae-Guyok, P'yongyang, has been reported to be a possible BW research center. In late 1965, this facility was identified as being a four-story, flat-roofed building measuring 326 by 65 by 65 feet. Construction materials were unknown. The white-painted building had many windows and was the only multistory building in the vicinity. Previous reports had been received on this installation, but the 1965 information was the first indication that the large building had been completed. A more recent report (early 1967) on this institute revealed that the existence of the facility was highly classified. The institute was guarded by North Korean Army troops, and no outsiders were permitted to visit the employees. The center was allegedly engaged in bacteriological research, using mosquitoes, flies, fish, birds, and rabbits in its experiments. The researchers of the institute were also reportedly studying the bacteriological warfare that the UN Forces had presumably employed during the Korean War.

b. In early 1966, reports indicated that poisonous insects and snakes were being imported from North Vietnam for experiments at the Bacteriological Research Center in North Korea. According to North Korean claims, a man bitten by one of these poisonous mosquitoes would die within 1 hour. A number of political criminals, listed by North Korean authorities as "missing," were supposedly used for some bacteriological warfare experiments.

(U)
Section III. ~~(S/NFE)~~ BW-RELATED RESEARCH AND DEVELOPMENT

(U)
7. ~~(S/NFE)~~ CHINESE COMMUNIST RESEARCH RELATED TO BW

(U)
a. ~~(C)~~ Infectious Diseases. BW-related data has evolved from Chinese Communist research involving microbial genetics, agricultural experiments, and prevention and control methods for infectious diseases. Pathogenic microorganisms under study include those causative of several diseases: Japanese B encephalitis (JBE), influenza, tick-borne encephalitis (TBE), measles, brucellosis, hepatitis, malaria, tetanus, dysentery, typhus, paratyphoid, smallpox, cholera, plague, diphtheria, pertussis, epidemic meningitis, poliomyelitis, typhoid, and scarlet

fever. (See table I for list of candidate BW agents.) According to an uncorroborated report, some of these pathogens have been tested at the West Mountain of Yen An (1693/1558) (36°36' N., 109°27' E.). Various "germ"-cultivating facilities for BW agents have been reported several times, but actual details of the work are unavailable because of security restrictions.

b. (U) Agricultural Research. In addition to their increased research intended to improve public health conditions, the Chinese Communists have advanced their agricultural research in plant disease control for increased output of food and fiber plants. Important plant pathogens that might be of interest to an anticrop warfare program include bacterial blight of cotton, rusts of wheat and corn, and rice blast. (See table I.)

(U)

c. ~~(S/NFE)~~ Facility for Crop Agent Research. One installation that may be conducting BW crop agent research is the Ho-Sheng Probable Agricultural Research Institute (fig. 2). A comparison of the photograph in figure 2, taken in November 1965, with photographs from September 1964, shows that considerable expansion has taken place. A new housing area has been constructed in the southern part of the installation, and 15 other buildings have been constructed on the north side. Two new roads have been built, and a tactical trench system, probably for training troops stationed at the institute, has been dug near the athletic field. On the west side of the installation, a previously barren area is now covered by experimental agricultural plots. Information is not available regarding the type of crop agents being investigated at this facility or other BW-related research that might be underway.

(U)

8. ~~(C/NFE)~~ NORTH VIETNAMESE ANTIPERSONNEL AGENT RESEARCH

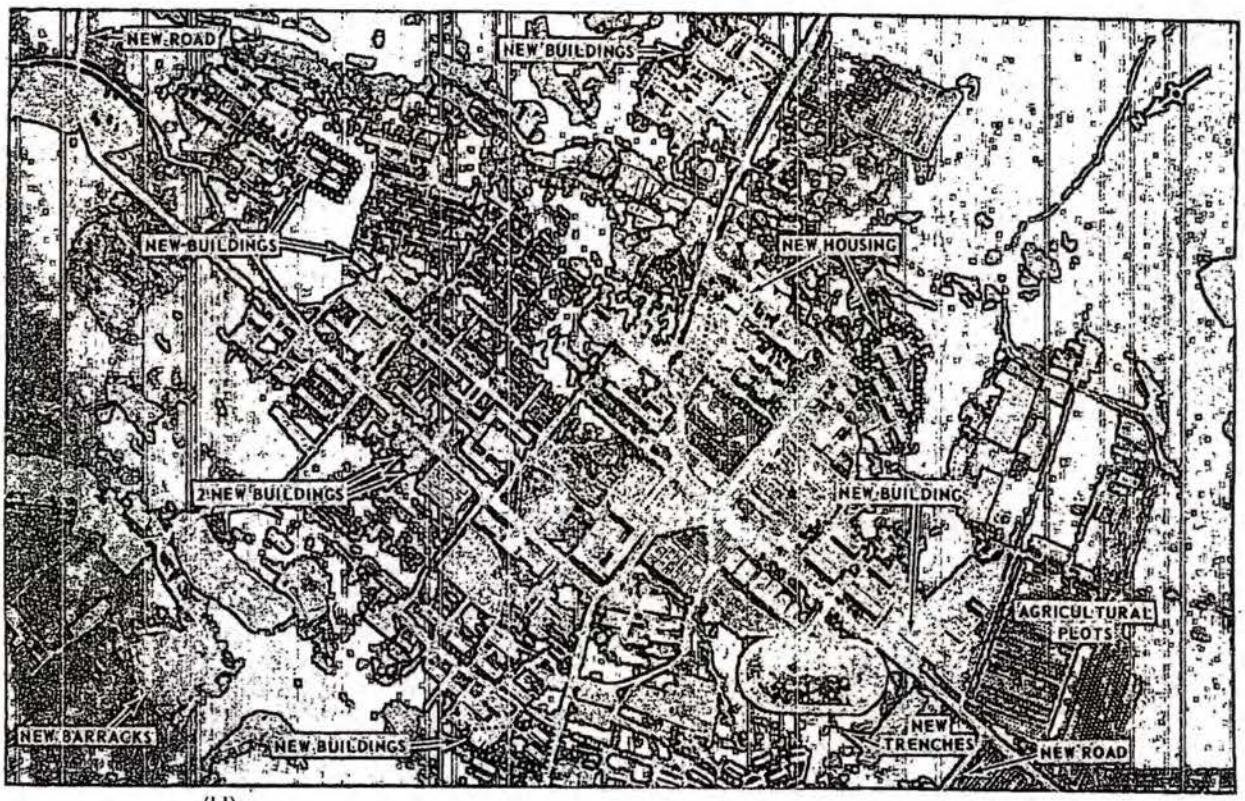
a. (U) Scrub Typhus. A North Vietnamese infection with BW possibilities is scrub typhus, also called Japanese River Disease (Tsutsugamushi fever), caused by Rickettsia orientalis, which is transmitted to humans by the larvae of a mite, Trombicula akamushi. The Ministry of Public Health considered various measures, including the establishment of research teams, in efforts to control the infections. Data obtained in this manner could be used to develop the agent for BW purposes.

(U)

b. ~~(C)~~ Other BW-Related Diseases. Other naturally occurring diseases and infections--including tetanus, melioidosis, anthrax, rabies, plague, and cholera--could be used by the Viet Cong and the North Vietnamese Army in BW actions. Melioidosis (a glanders-like disease) and plague have been reported as affecting military operations and have been under study at the Institut Pasteur du Vietnam. Several diseases of BW significance have caused epidemics of uncertain origin. In January 1964, cholera spread throughout neighboring provinces of Saigon and resulted in approximately 10,000 cases, with 600 deaths in a 5-month period. Efforts to trace the epidemic raised questions as to the possibility of a deliberate BW attempt by the North Vietnamese. The epidemic was caused by the El Tor strain of cholera, a type seldom found in southeast Asia and one to which few people are naturally resistant.

(U)
Table 1 (~~C~~). Possible BW Agents Developed in Communist China (U)

Causative agent	Type of microorganism	Disease caused	Effective against
Influenza virus	Virus	Influenza	Man
Shigella species	Bacteria	Dysentery (bacillary)	Man
JBE virus	Virus	JBE	Man
Rickettsia prowazeki	Rickettsia	Typhus (louse borne)	Man
Pasteurella pestis	Bacteria	Plague	Man
Vibrio comma	Bacteria	Cholera	Man
Salmonella typhosa	Bacteria	Typhoid fever	Man
Brucella species	Bacteria	Brucellosis	Man and animals
Corynebacterium diphtheriae	Bacteria	Diphtheria	Man
Coxiella burnetii	Rickettsia	Q-fever	Man
Rickettsia tsutsugamushi	Rickettsia	Tsutsugamushi fever (scrub typhus)	Man
Foot-and-mouth disease virus	Virus	Foot-and-mouth disease	Animals
Hog cholera virus	Virus	Hog cholera	Animals
Puccinia species (glumarum; graminis tritic; tritici)	Fungus	Wheat rusts (stripe, steam, leaf)	Plants
Piricularia oryzae	Fungus	Rice blast	Plants
Puccinia maydis	Fungus	Corn rust	Plants
Xanthomonas malvacearum	Bacteria	Bacterial blight of cotton	Plants



(U)

Figure 2 ~~(S/NFE)~~. Chinese Communist installation for possible BW crop agent research (S).

c. (U) Potential Threats. The Clinic of Infectious Diseases, Prague, Czechoslovakia, aided North Vietnam in a study of the status of infectious diseases in North Vietnam, disclosing the prevalence of leptospirosis, typhoid fever, tetanus, and Staphylococcus enterotoxin. Among the tropical infectious diseases, dengue, leprosy, and JBE are frequent. Other potential threats include typhus, tuberculosis, and fungus diseases. Smallpox is prevalent and becomes epidemic every 3 to 4 years. Sporadic cases of plague also occur. There is insufficient evidence to determine what BW-related diseases might be under investigation, per se.

d. (U) SV40 Virus. In the jungles of North Vietnam, monkeys are often infected with SV40 virus. Problems related to this infection were studied by examining the serum of slaughtered apes. All work was carried out in a field laboratory erected in the jungles. The material obtained from the monkey farm of the "Naferimeks" company was treated at the Institute of Hygiene and Epidemiology in Hanoi. A mutual study of the materials obtained was carried out by M. Ya. Chumakova at the Institute of Poliomyelitis and Viral Encephalitis, Academy of Medical Sciences, Moscow. Humans are also susceptible to SV40 virus, and there may be some BW-relationship in this fact.

(U)
Table II ~~(C)~~. Possible North Vietnamese Antipersonnel Agents for BW (U)

Causative agent	Type of microorganism	Disease caused
Vibrio comma	Bacteria	Cholera
Plasmodium falciparum (transmitted by Anopheles mosquito)	Protozoa	Malaria
Dengue fever virus (transmitted by Aedes aegypti mosquito)	Virus	Dengue fever
Salmonella typhosa	Bacteria	Typhoid fever
Salmonella paratyphi and S. schottmuelleri	Bacteria	Paratyphoid fever
Rabies virus	Virus	Rabies
Shigella species	Protozoa Bacteria	Amoebic dysentery Bacillary dysentery
Rickettsia prowazeki	Rickettsia	Typhus (louse borne)
Rickettsia tsutsugamushi	Rickettsia	Tsutsugamushi fever, scrub typhus (mite borne)
Leptospira species	Bacteria	Leptospirosis
Pasteurella pestis	Bacteria	Plague

(U)
e. ~~(C)~~ Environmental Factors. Whether North Vietnam is conducting BW research and development is unknown. Many diseases are prevalent among the North Vietnamese population that could be used as BW agents. From an environmental standpoint, BW programs are ideally suited to North Vietnam, and are favorable to a Communist BW offensive. The North Vietnamese and the Viet Cong are capable of taking advantage of a poor health situation and causing the spread of various infectious diseases. The detection and proof of deliberate offensive BW is almost impossible, however, since it blends so well with the existing health situation. Endemically occurring infections provide the mask for BW attempts on a scale that would not require large sophisticated research centers and equipment. (See table II for possible BW agents.)

(U)
f. ~~(C/NFE)~~ Trends.

(U)
(1) ~~(C)~~ The North Vietnamese trend in public health is toward limited and gradual control and eradication of the infectious diseases that adversely affect the country and tend to lower the standard of living. North Vietnam depends on Soviet

assistance for research programs in public health and epidemiology for certain diseases that are well under control or that are not indigenous in other countries. The North Vietnamese are accepting aid from, and have leanings toward, the East European Communist Countries. Recent agreements have been noted between North Vietnam, the U.S.S.R., and Czechoslovakia, in establishing and carrying out programs for prophylaxis against and eradication of infectious diseases. The BW significance in these matters of national concern is difficult to determine, but the belief is that BW is recognized and is being given adequate consideration.

(U)

(2) ~~(C/NFE)~~ A recent report reveals that sophisticated laboratory equipment has been captured from the Viet Cong for the first time. Personnel in the capturing unit report that, in addition to the items submitted for analysis, stained microscope slides and Petri dishes containing media and bacterial cultures were found. These discoveries suggest that the laboratory capability of the Viet Cong includes routine bacteriology. Although not confirmed, BW agents may be examined and studied in this effort to permit the establishment of a basic BW program.

(U)

9. ~~(C)~~ ANTILIVESTOCK AGENT RESEARCH IN NORTH VIETNAM

a. Current Research. No research has been reported in North Vietnam that might be equated to a formal BW program considering animals as the target. The diseases of military importance in Vietnam are specifically related to personnel, with only a few of animal origin. Available literature shows little or no interest in the natural occurrence of animal diseases in the same context as that shown for those diseases affecting the public and the military in Vietnam.

b. Trends. Information is lacking on the present status and possible trends regarding antilivestock BW programs in North Vietnam.

(U)

10. ~~(C)~~ NORTH VIETNAMESE ANTICROP AGENT RESEARCH

Natural occurrences of several crop diseases provide opportunities for the North Vietnamese to conduct anticrop BW programs on a covert basis. Yellow blight inflicts heavy losses on rice crops in the northwestern areas and has been under study from 1958 through 1966. The black-tailed green aphid (Nephotettix bipunctatus) is the vector of this virus disease, and certain varieties of rice, especially Tan Nong and Tan Ngan, are highly susceptible. The North Vietnamese have organized a movement to engage in science and technology, especially to experiment on rice fields, to grow plants that can be used as fertilizer, to transplant rice seedlings, and to conduct additional efforts designed to increase crop production. Research devoted to controlling crop disease could become the foundation for a BW-related anticrop program.

(U)
11. ~~(S)~~ FOREIGN AID FOR NORTH VIETNAMESE RESEARCH

(U)
a. ~~(C)~~ Communist China. Most of the aid given North Vietnam by Communist China has been in the form of military goods and supplies for immediate use. Except for a few workers engaged in epidemiological surveys with the small-scale concomitant laboratory, no evidence has appeared on Chinese Communist aid to a planned North Vietnamese BW program. Certain medical supplies and unspecified bacteriological items are reported to have been sent via Communist China to North Vietnam from the Soviet Union and East Germany. No information is available, however, to indicate that the aid is in BW research and development activities.

(U)
b. ~~(C)~~ Soviet Assistance. A shipment of 33 kg of Soviet bacteriological items for Hanoi arrived in Pei-P'ing by air from Moscow and Irkutsk in early 1965. Attached to the freight was a label warning that the bacteriological items should not be allowed to freeze. The specific contents and purpose of this material were not disclosed, but the logical assumption would relate it to the medical needs of the Vietnamese conflict. Except for liaison with a few Soviet scientists in conducting epidemiological surveys for disease eradication, no reports have appeared of a formal BW program supported by Soviet aid. The North Vietnamese would probably follow Soviet patterns in setting up a BW research and development program, once their immediate public health problems have been settled.

(U)
c. ~~(S)~~ Other Foreign Aid. Possible military significance has been noted in reports of Czechoslovak aid to North Vietnam. Aside from material assistance, two top Czechoslovak biologists in the field of microbiology and virology were reportedly dispatched to North Vietnam, possibly for research and development work. Belgium has aided the Viet Cong with pharmaceuticals, including antibiotics, to help them cope with naturally occurring infections and for defense against possible BW attacks. Medical supplies from East Germany have been transshipped to Hanoi via Communist China; however, the exact nature of the supplies has not been disclosed, and no BW value for defense can be determined.

12. (U) BW AGENT RESEARCH IN NORTH KOREA

The few available reports do not specify the microorganisms that North Korea would possibly develop as BW agents.

(U)
Section IV. ~~(S/NFD)~~ BW WEAPONS AND MUNITIONS SYSTEMS

(U)
13. ~~(C/NFD)~~ CHINESE COMMUNIST BW SYSTEMS

(U)
a. ~~(C)~~ Although approximately 17 biological agent research installations are known to exist in Communist China, information concerning the employment of biological agents is not available. No BW munitions have been identified in Communist China, but a BW arsenal is reported to exist.

(U)

b. ~~(C/NFD)~~ The Chinese Communist Army is thought to have a fair capability to manufacture BW agents. This information was contained in a China Ministry of Defense document that traced Communist China's progress in BW developments since 1949.

(U)

c. ~~(C)~~ In early 1960, information became available that the Chinese Communists were competently conducting aerobiological laboratory studies on aerosol stability and virulence of pathogenic microorganisms. These studies could definitely contribute to a BW program for surface-to-surface, surface-to-air, or air-to-surface dissemination of BW agent aerosols. These studies, in conjunction with increased emphasis on certain microbial agents,such as JBE virus and continued technological development of agricultural equipment, indicate a small-scale capability for effective biological weapons that could currently be well along in development.

(U)

14. ~~(S/NFD)~~ BOMBLETS AND SHELLS USED BY CHINESE COMMUNISTS

(U)

a. ~~(C/NFD)~~ The Chinese Communists reportedly possess various types of shells, bombs, and missiles that could support their claim of having "germ" shells for use in BW.

(U)

b. ~~(C)~~ Communist China has the capability to develop certain prearranged weapons, one of which is called a biological agent container. In operation, various bacteria and toxins could be placed inside synthetic containers that break or decompose automatically after being submerged in the water supply for a specified period. Agents in this type of container can start epidemics, destroy grains, and lower morale when placed in water or food supplies, public places, grazing areas, or granaries. Containers are usually used in this method of starting epidemics, but the Chinese Communists would use human beings as carriers; therefore, defectors must be quarantined. The Chinese Communists would probably use such means without fear of reprisal. Their justification in using these weapons is reportedly based on their belief that the United States used germ warfare during the latter part of the Korean War. All attempts at substantiating evidence of specific weapons have been unsuccessful.

(U)

c. ~~(S/NFD)~~ In mid-1966, a single source reported that the Chinese Communists planned to introduce foot-and-mouth disease into the United States. The method of virus release was not disclosed. If carefully conducted, however, the virus of this easily spread and highly destructive disease could be extremely costly. Since the Chinese Communists intend to become a world power, the assumption can be made that they have thoroughly investigated the possibilities of biological weapons and have tested them on a small scale.

(U)

15. ~~(S/NFD)~~ CHINESE COMMUNIST AERIAL AND GROUND SPRAY SYSTEMS

Little information is available to indicate a Chinese Communist capability for large-scale BW agent dissemination. Several reports have stated that the Chinese

Communists are capable of air delivery of BW agents; however, the details of such an accomplishment have not been disclosed. A few agricultural sprayers for use with walking tractors (Nung-7 Model), capable of spraying an area 54 feet high and 75 feet wide, could be converted for BW agent dissemination. Motorized agricultural chemical sprayers and a portable smoke producer for pest extermination are also available. The increasing attention toward upgrading agricultural production has resulted in sophistication of aircraft spray technology for chemical fertilizers, weeding agents, and spray insecticides. With the assignment of aircraft to agricultural tasks, the crop-dusting technique could be applied to anticrop warfare with little difficulty. The possibility also exists that the same equipment and technology could be utilized for dissemination of pathogenic microorganisms. Research in virology and tissue culture to produce microorganisms for public health purposes contributes to BW state-of-the-art.

(U)
16. ~~(C)~~ VECTORS AS A BW SYSTEM IN COMMUNIST CHINA

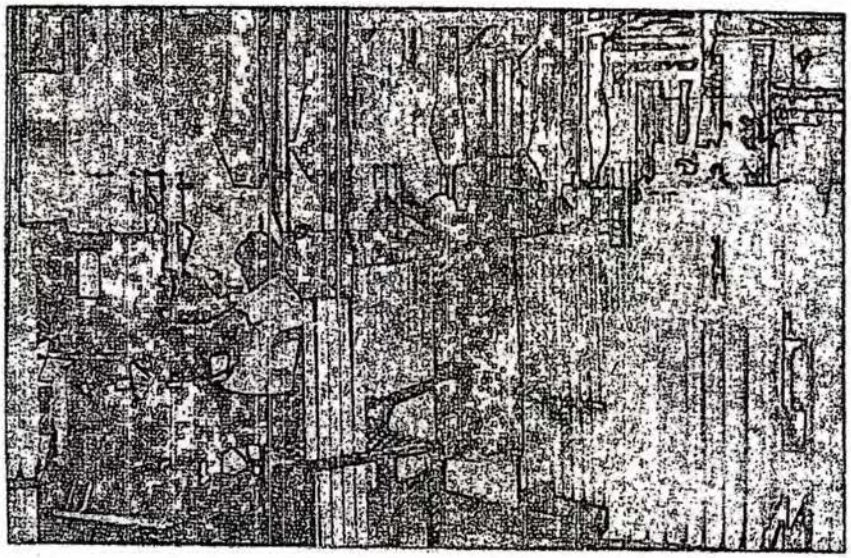
a. From the military point of view, a vector is best defined as an arthropod that transmits certain viral, bacterial, rickettsial, and fungal disease agents that infect humans and animals and that damage or destroy crops. No entomological BW research and development program has been mentioned in literature in Communist China; however, entomological research being conducted relative to insect disease transmission and control is applicable to such a program for military purposes.

b. Since the equipment required in entomological BW research and development is normally not so expensive and complex as that required for other BW efforts, an insect vector biological weapon system would be economically feasible for Communist China.

c. Current research is being conducted on species of mites that are pests of crops, storage, and animals and on those recognized as vectors of human diseases. Different types of Anopheles mosquitoes have been studied to determine the most important vectors of malaria. Although malaria is not generally considered a classical BW agent, it is nonetheless a disease of considerable military importance. In the current Vietnam conflict, the disabling effects on troops as a result of drug-resistant malarial forms have been quite pronounced. Therefore data derived from methods of combating such diseases would also aid technological development of an effective biological vector weapon system.

d. The bulk of pertinent insect vector research can be well summarized from a brief account of the scientific conference of the Entomology Society of China held at Han-ning in April 1965. At the conference, which was concerned with the use of bioassay in medical entomology research, 116 research and special reports were presented. The objectives of the conference were to summarize experiences in the control of diseases carried by insect vectors and to raise research levels in mosquito and fly eradication. Papers presented included "The Application of Bioassay in Medical Entomology Work," "The Toxicity of Organic Phosphorus

Insecticides Against Mosquitoes and Flies," "Mosquito Experiments on Toxicity and Assay of Drug Resistance," "Fly Experiments on Toxicity and Assay of Drug Resistance," and "Problems in the Use of Insecticides." This research, along with that being conducted on the life cycle and biological control of insects in Communist China, is apparently of good quality. An electron tube plant with 20-watt black-light bug lamps for insect extermination is shown in figure 3. Data obtained from these research programs would aid the development of a complex weapon system using insects to transmit pathogenic diseases affecting military and civilian populations. This form of warfare lends itself readily to the geographical setting and internal conditions of Communist China. The assumption can be made that even more productive research has taken place since the 1965 conference.



(U)
Figure 3 ~~(C)~~. Hua-tung electron tube plant in Communist China ~~(C)~~. (U)

(U)
17. ~~(C)~~ NORTH VIETNAMESE BW SYSTEM

a. On several occasions, the North Vietnamese have accused the United States of the following: "(1) U.S. Imperialists are dropping automatic bombs--when the bombs hit the ground, doors automatically open and release insects infected with germs; this is often used in tropical countries where the warm weather prolongs the insect's life span; (2) planes are used to spray a mist which persists in the air for 24 hours; (3) delivery means are bombs and missiles; (4) boats are used to release pestilential rodents; (5) contaminated rice is dropped in forests for mice to eat and then transmit disease to people, cockroaches, and rodents, etc.; biological weapons not only transmit disease directly to persons but also contaminate animals and crops and consequently people; (6) shell fish infected with

germs are put in the water along the seacoast and river banks; (7) contaminated clothing and equipment is left behind upon withdrawal; and (8) the 'Biet Kich' (command-type unit) put germs in the water or food in the combat areas."

b. In addition to the propaganda purposes of the above accusations, these statements could well represent North Vietnamese interests in obtaining or developing their own weapon systems. Although no known munitions can be attributed to the North Vietnamese, captured documents refer to the fact that "in South Vietnam during the dry season the warm weather is favorable for the use of bio-weapons." The North Vietnamese defined a bio-weapon as "a type which uses germs (bacteria, virus, and toxic fungi). The germs may be used to contaminate directly or through germ-bearing insects (vector mosquitoes, flies, ticks, spiders)." Despite North Vietnamese limitations in conducting BW activities, the foregoing quotations indicate concern for possible offensive use of biological weapons.

(U)

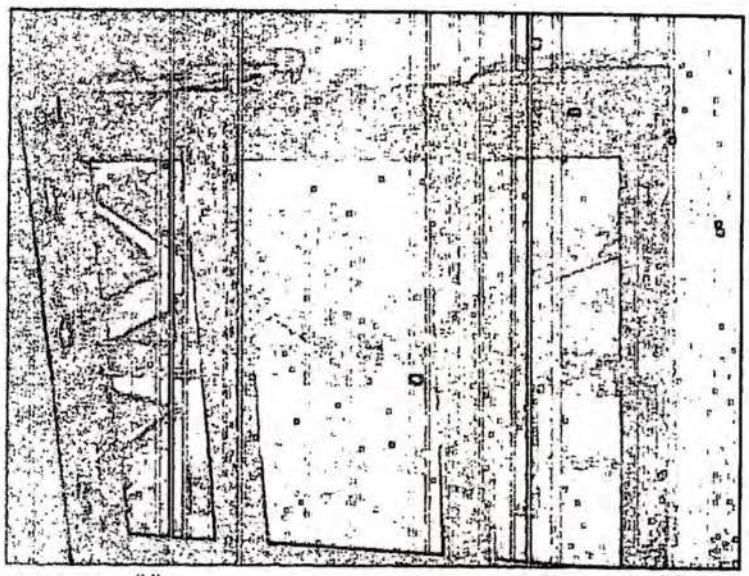
18. ~~(S/NFE)~~ BW METHODS IN NORTH VIETNAM

(U)

a. ~~(C/NFE)~~ Spike Trap Devices. The North Vietnamese have no known sophisticated BW weapon dissemination systems. Consequently, they employ various makeshift devices. In 1965, the Viet Cong were reportedly making two different Montagnard-inspired spike traps. One was a two-pronged "laminated spike;" the prongs had iron heads and were poison tipped. The spikes were emplaced around important installations such as ammunition depots and district, provincial, and interprovincial committee headquarters. The Viet Cong also employ barb-spiked traps and bamboo-speared traps (fig. 4 and 5) to inflict wounds that can subsequently become infected through the unsanitary environment. The "Crow's Foot" is a four-pronged foot trap that the Viet Cong fling into fields. This device and its variations (the foot spike or "punji") are honed to razor sharpness and coated with excrement. The Viet Cong consider this a worthwhile adjunct since it practically assures that a wound will become infected and cause the soldier to be taken out of action. Untreated, these wounds may become gangrenous and may eventually lead to amputation. The troops of the South Vietnamese Army are particularly vulnerable to the devices, since many of them wear no shoes or unreinforced boots.

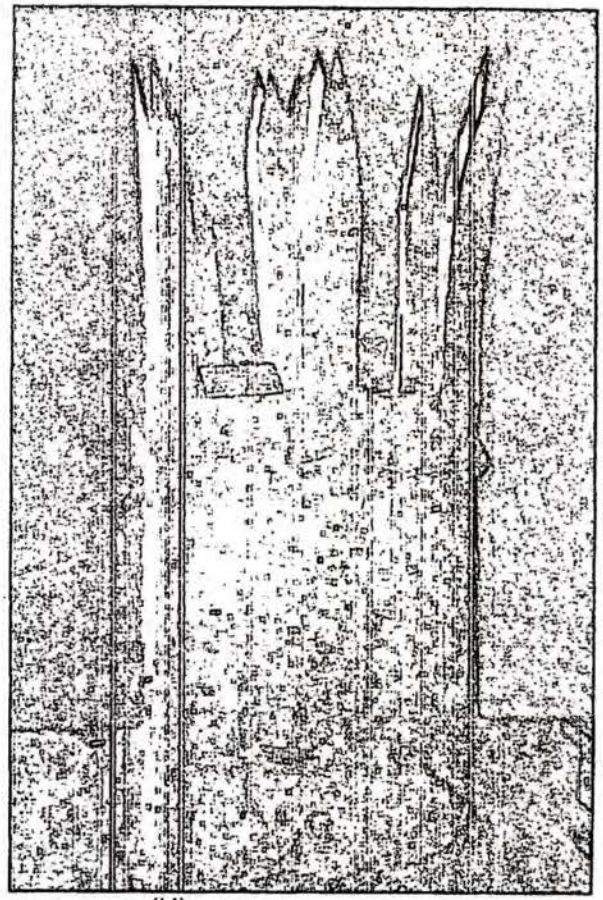
(U)

b. ~~(S)~~ Covert Threats. According to recent reports, the North Vietnamese, aided by Soviet and Chinese Communist technicians, now have the capability to conduct widespread chemical and biological warfare. A special report flatly states that "mass poisoning of water reservoirs, bacteriological warfare and mass infection with typhus--using bacteria supplied by the Chemical Directorate of the Soviet Ministry of Defense--represent types of clandestine destructive techniques available to the North Vietnamese." Both U.S. and South Vietnamese troops have been stricken after drinking water that presumably had been contaminated by the Viet Cong, but the typhus infections were not traceable to covert activities of the Viet Cong or North Vietnamese.



(U) (U)

Figure 4 ~~(S)~~. Barb-spiked trap used by Viet Cong ~~(S)~~.



(U)

Figure 5 ~~(S)~~. North Vietnamese bamboo-speared trap ~~(S)~~. (U)

(U)
c. ~~(C)~~ Disease Vectors. Inadequate hygienic conditions in Vietnam are conducive to the presence of several disease vectors that can transmit diseases of military interest. The use of mosquitoes, ticks, lice, and other carriers to spread BW-related diseases constitutes a possible BW weapons system. Especially prevalent are the Aedes aegypti and A. albopictus mosquitoes, which transmit the virus causative of dengue. The potential BW agent yellow fever is also transmitted by the Aedes aegypti mosquito. Fleas of many species are widespread; the Indian rat flea, Xenopsylla astia, is the chief vector of plague and murine typhus. Naturally occurring diseases can work, or be made to work, in favor of the Viet Cong to cause widespread infection, but establishing proof of a BW intention would be nearly impossible.

19. (U) NORTH KOREA

No BW weapons are known to exist in North Korea.

(U)
Section V. ~~(S/NFD)~~ BW DEFENSE

(U)
A. ~~(S/NFD)~~ COMMUNIST CHINA

(U)
20. ~~(C/NFD)~~ GENERAL

(U)
a. ~~(C/NFD)~~ The Chinese Communists are very much concerned with BW defensive techniques. The responsibility for defense rests with the Chemical Corps School of the Chinese People's Liberation Army (CPLA). A special branch, the Fan-hua-hsueh-ping, was created in 1956 for exclusive handling of protection against CBR weapons. The CPLA began training for defense against CBR weapons after the outbreak of the Korean War. Research concerned with defense against CBR is conducted by the Academy of Medical Sciences, CPLA. Their program has been patterned after the Soviet system, and the Academy has translated, for its own use, many Soviet documents on protection against biological weapons.

(U)
b. ~~(C/NFD)~~ The Chinese Communists have a limited amount of equipment for troop defense against BW agents. Available equipment includes protective masks effective against microbial agent aerosols and protective clothing for use as an entomological deterrent. All this equipment is believed to be of Soviet origin.

(U)
c. ~~(C)~~ Laboratory investigations of rapid identification techniques of microorganisms are being conducted by the Chinese Communists; these techniques are basic to the development of detection-identification equipment. Such equipment, however, is not known to have been developed in Communist China. Decontamination procedures and equipment are patterned after those of the U.S.S.R. but are in limited supply. Research programs and facilities in Communist China indicate a good capability for the development and production of vaccines and antibiotics for the military and for normal peacetime use.

(U)
21. ~~(C)~~ DETECTION SYSTEMS

a. The Chinese Communists are conducting competent investigations involving the fluorescent antibody staining technique (FAST) for positive identification of bacterial and viral agents. Important work on the application of fluorescent antibodies for the detection of Pasteurella pestis is being conducted at the Institute of Epidemiology and Microbiology, Chinese Academy of Medical Sciences, Peking. In late 1965, Communist China reported the manufacture of a new drug, Fluorescein, for rapid diagnosis of viral diseases. Other work of value to a rapid detection program includes a modified complement fixation text for TBE and an immunological method for detection of Coxiella burnetii, the causative agent of Q-fever. These methods are significant in that the microbial agents mentioned are potential BW agents, and because the techniques involved are also useful with many other bacterial, viral, and rickettsial agents of possible BW interest.

b. Little information is available to indicate a capability in the development of BW detection devices. In 1963, Chinese Communist CBR protection units were reported to have the Soviet PKhR-54 detector kit for chemical agent identification; no reference was made to the use of detection equipment specifically for BW agents. Since that time, additional data have been obtained to indicate the presence of this kit in other Asian Communist Countries, with the recent implication that it is applicable to BW agent detection. (See par. 30 and fig. 11) The Chinese Communists may be considering the development of better detection devices in their concern with BW defense.

(U)
22. ~~(S/NFD)~~ BW PROTECTION EQUIPMENT AND SUPPLIES

(U)
a. ~~(C)~~ Masks, Clothing, and Shelters.

(U)
(1) ~~(C)~~ The March 1966 issue of the Liberation Army Medical Journal contains an article entitled "Prevention and Protection Against Biological Warfare." The article recommends that water sources and food supplies be carefully guarded and that masks and nets be worn for protection of the respiratory tract and the skin. The extent to which the Chinese Communists are supplying protective equipment to meet the recognized need is not known. Reports from the late fifties and early sixties credit the Chinese Communists with a limited supply of protective masks of the Japanese Army types 99 and 99-3, the Soviet ShM-1, and the type 24 left by the Nationalist Army. Communist China is probably now producing some new protective equipment in addition to that initially supplied by the U.S.S.R. prior to 1960.

(U)
(2) ~~(C)~~ No information is available pertaining to Chinese Communist protective clothing specifically designed for BW use. Generally, protective clothing would be required only in the case of entomological warfare. The limited quantities on hand of both heavyweight and lightweight impermeable protective suits of rubberized fabric could be adapted to those instances where body protection is needed. BW protection has not, up to this time, been separated from that designated as CBR. Figure 6 shows Chinese Communist CBR reconnaisance troops in light protective clothing.

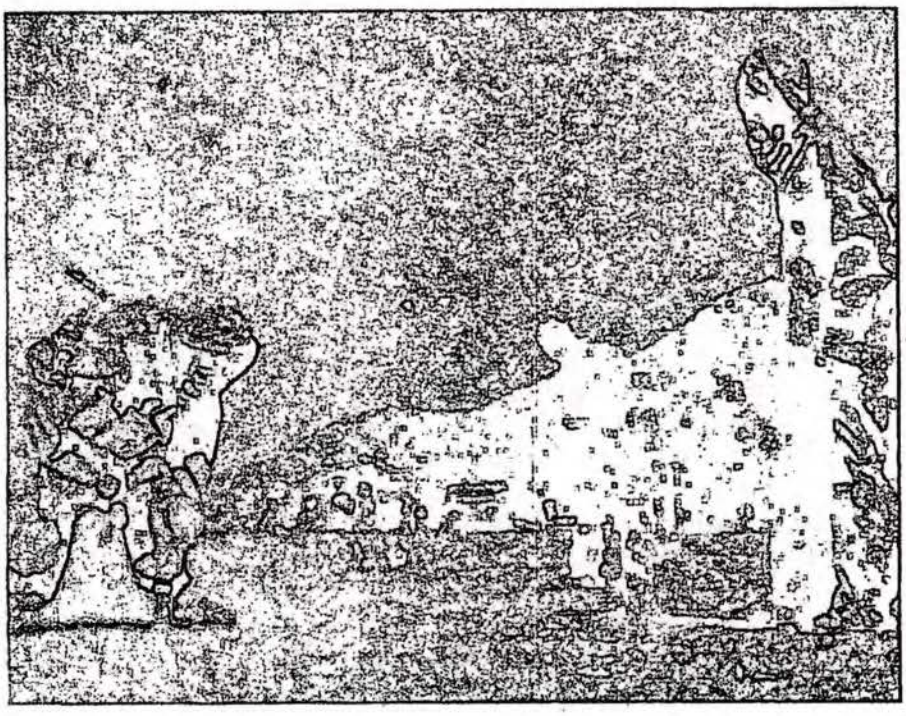


Figure 6 (U). Chinese Communist reconnaisance team in light protective clothing (U).

(U)
(3) ~~(C)~~ Literature to date does not indicate a capability in Communist China for individual or collective shelters. In view of Chinese Communist exploitation of European Communist and Western publications containing information on defense against biological weapons, the Chinese Communists are probably developing or planning to develop all forms of protective equipment on a par with the advanced nations. Their state of readiness in this area cannot be currently assessed, however.

(U)
b. ~~(S/NFD)~~ Vaccines, Sera, and Antibiotics.

(U)
(1) ~~(S/NFD)~~ Recent successes in Chinese Communist public health and microbial genetics have led to the development of several effective antibiotics and a few vaccines. Approximately 40 facilities are known or suspected to be involved in BW-related research pertinent to prevention and control methods for infectious diseases--primarily JBE, influenza, TBE, measles, brucellosis, hepatitis, and malaria. Although extensive research is being done on JBE, a successful vaccine has not been developed. Success was reported in early 1966, however, with the production of a vaccine of highly attenuated live measles virus which gives effective immunity. The Chinese Communists are also actively conducting studies to find effective antiviral compounds. Work underway at the Laboratory for Biochemistry of the Institute of Biological Products, Ministry of Health, on detoxification of Salmonella endotoxin and work with Clostridium botulinum indicate an interest in and a possible capability to protect against lethal and incapacitating microbial toxins.

(U)
(4) ~~(C)~~ The Chinese Communists also conduct agricultural research applicable to defense against anticrop warfare. Research in plant protection is directed toward the broad areas of disease prevention and insect pest control. In the area of disease prevention, investigations into the biological characteristics of major plant diseases have provided an overall understanding of their occurrence and development. Some of the results have already found applications in forecasting the future occurrence of diseases such as stem rust of wheat and seedling blight of rice. Research in fungicides is progressing rapidly. Favorable results have been obtained by the use of chemicals such as sulfur powder, hexachlorobenzene, and "Ceresan" for treating seeds and soils to prevent diseases of wheat, rice, fruits, and vegetables. Selection of disease-resistant varieties of rice and wheat is another effort in combating major plant diseases; these resistant varieties are being used to increase crop production.

(U)
(5) ~~(C)~~ Research in antibiotics for plant diseases is a relatively new field. At present only a few projects are underway, including the development and use of antibiotics for controlling diseases of cotton plants. Results are being obtained, but in some cases actual field tests are still required.

(U)
(6) ~~(C)~~ In the area of insect pest control, studies on the living habits and biological development of insects provide data upon which more reliable forecast and control methods are being developed. As a result of these studies, more than 40 types of comparatively systematic forecast methods have been established, most of which are used predominantly for short term forecasting. Research is in progress for medium and long-term forecasting of certain insect outbreaks. Studies of the factors contributing to outbreaks of insect pests are leading to changes in certain agricultural practices--such as planting, crop rotation, cultivation methods, and selection of insect resistant varieties of crops--all of which have an important bearing on insect control. In chemical control methods, organic insecticides are being rapidly developed. Notable achievements have been made in the research and production of 666 and DDT and in the use of 666 to control locusts and other injurious insects. Organic phosphorus compounds, fumigation compounds, and other plant chemicals are being investigated, utilized, and produced as insecticides. Biological control of insect pests has also been considered.

(U)
23. ~~(C)~~ DECONTAMINATION EQUIPMENT AND SUPPLIES

a. Disinfectants. The CPLA is reported to have a capability to produce decontaminating agents such as bleaching powder and DANC (1, 3 dichlorodimethylhydantoin) solution as part of the weapon decontamination case carried by soldiers in CBR protective units. Further details on production and use of disinfecting agents for BW are not described in the literature. The technology used in the manufacture of chemicals for insect control could be applied to the production of effective BW decontaminants and disinfectants.

(U)

(2) ~~(C/NFD)~~ In September 1965, Chinese Communist policy called for concentration on preventive medicines and treatments. Prevalence of disease, however, required that equal emphasis be given to treatment. The Chinese Communists also concentrate on "popularizing" certain drugs and integrating traditional Chinese and Western medical techniques. The Chinese Communists have discovered drugs for treatment of chronic malaria and other diseases, but supplies are limited. Some broad-spectrum antibiotics are mass produced (e.g., terramycin, streptomycin, and aureomycin), with priority given to the production of sulfonamides and penicillin. Modern pharmaceutical production equipment is used as indicated in figure 7. The main difficulties encountered by the Chinese Communists have been with harmful side effects and development of resistance by bacterial strains to the action of the drugs. Chinese Communist knowledge in the pharmaceutical field seems fairly advanced and has apparently reached a higher plane than their productive capability in this area. When supplies are limited for civilian use, the available production is probably being supplied to the military. Current research does not discuss aerosol immunization, and the only reference deals with a 1960 report of Chinese Communist aerosol chamber experiments.

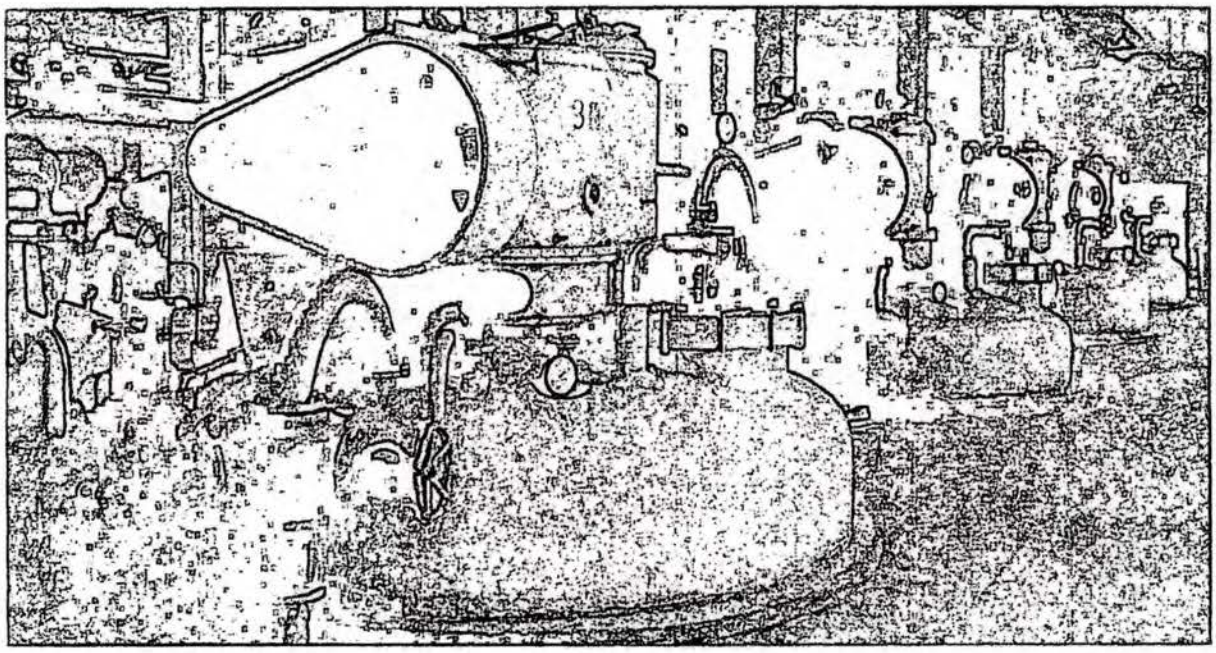


Figure 7 (U). Penicillin department of a Chinese Communist pharmaceutical plant (U).

(U)

(3) ~~(C)~~ Only a few reports concerning prevention of livestock disease and control in Communist China have appeared. On the basis of the moderate amount of vaccine, sera, and antibiotics research underway, the assumption can be made that some capability also exists in the area of animal disease prophylaxis. Lack of information precludes a determination of the extent to which such a directed research program is being conducted.

b. Equipment and Devices.

(1) Decontamination soldiers reportedly carry individual decontamination kits. Each unit is provided with a "weapon or gun decontamination box," a knapsack-type decontamination set (resembling the DDT sprayer), "automatic washing care" equipment, and the "weapon and equipment decontaminating car." Most of these are Soviet furnished; only a few are made by the Chinese Communists. The Chinese Communists are capable of producing this equipment easily, however, by applying their techniques in the manufacture of farming machines and tools, and in motor vehicle industry. The assumption can therefore be made that the CPLA is being gradually equipped with decontaminating equipment of Chinese Communist origin.

(2) For extensive decontamination on the battlefield, available equipment includes ground decontaminating trucks loaded with such decontaminating agents as bleaching powder and bleaching solutions. A primitive looking truck, probably produced by the Chinese Communists and adapted from the latest Soviet PDP-53 decontamination vehicle is shown in figure 8.

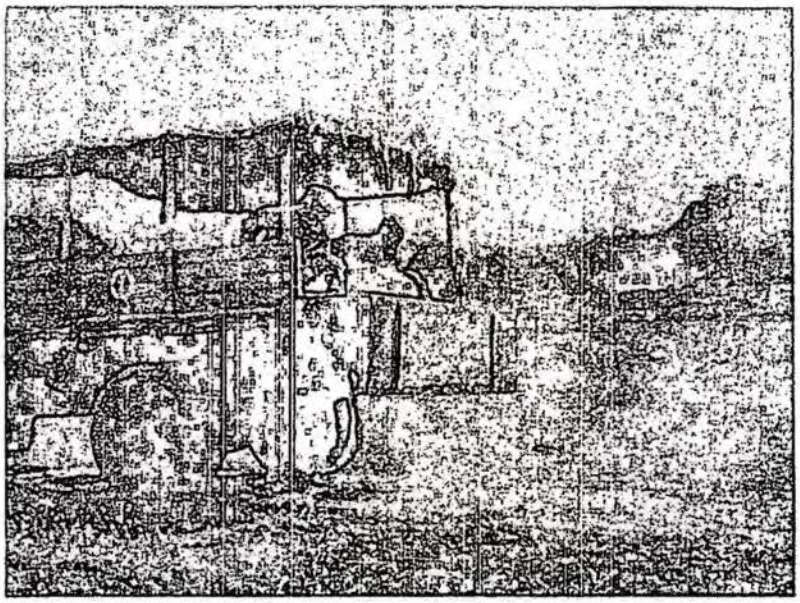


Figure 8 (U). Chinese Communist decontamination vehicle (U).

(3) Chinese Communist information on BW decontamination is general and explains only that protection procedures are the same as those described in the U.S. Army and Japanese Self-Defense Force Manuals concerning CBR protection.

(U)
B. ~~(S/NFD)~~ NORTH VIETNAM

(U)
24. ~~(C)~~ DETECTION SYSTEMS

Except for small-scale laboratory diagnosis of infectious diseases, no information is available regarding automated detection systems for BW agents. Recently captured and translated Viet Cong documents recognize the necessity to detect and identify BW agents, but details of such techniques or devices are not described. The Soviet PKhR-54 detector kit has been reported in North Vietnam but the extent of its use is not known.

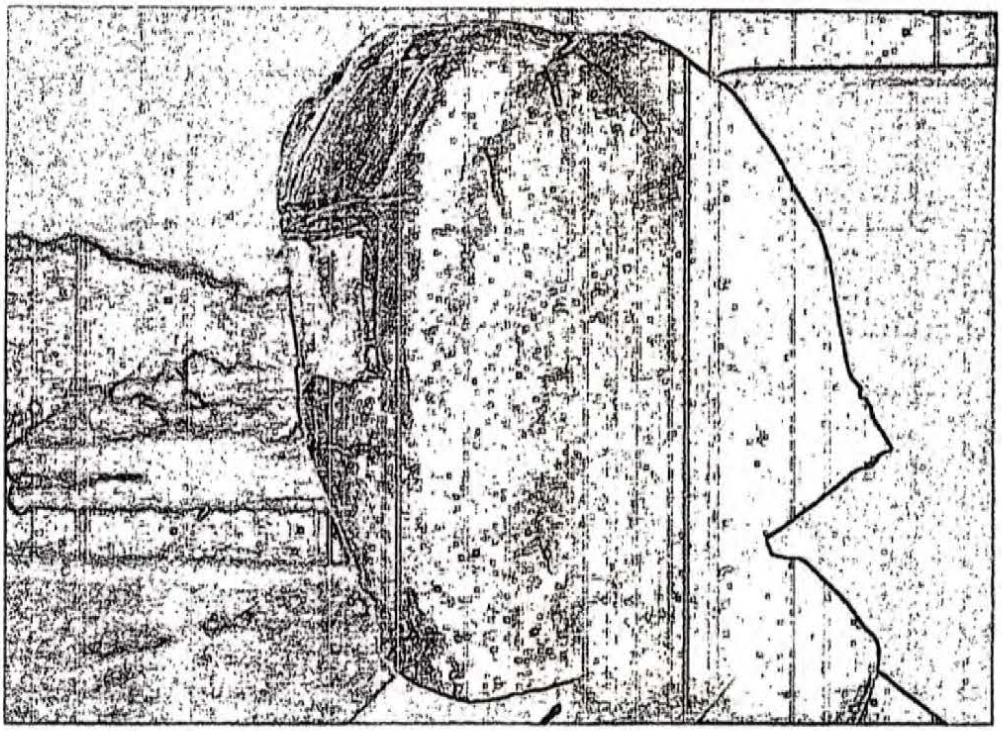
(U)
25. ~~(S/NFD)~~ BW PROTECTION EQUIPMENT AND SUPPLIES

(U)
a. ~~(C/NFD)~~ Protective Masks and Clothing.

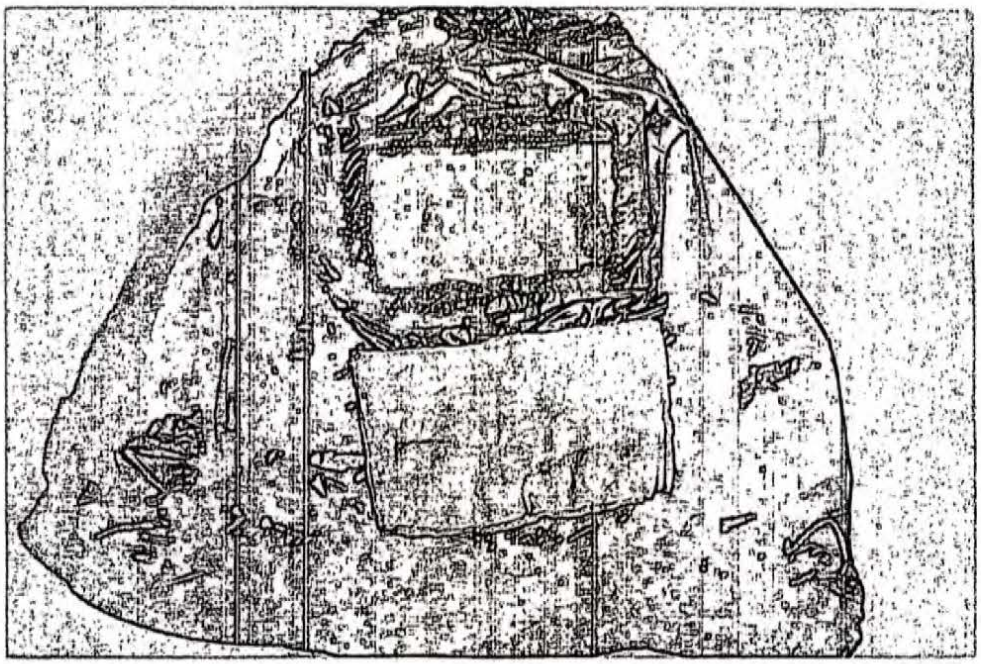
(U)
(1) ~~(C/NFD)~~ A defector who had been employed in a North Vietnamese antiaircraft company reported that all personnel were given mosquito nets and were ordered to use them each night. No insect repellent was issued. The C-15 Antiaircraft Company campsites in North Vietnam employed no mosquito control, and provided no protection against mosquitoes other than mosquito netting.

(U)
(2) ~~(C/NFD)~~ Instructions were given for homemade masks to be used for protection against the spraying of defoliation chemicals by U.S. and South Vietnamese troops. These masks, used to cover the nose and mouth, consist of nylon cloth folded over many times and dipped in a solution of lime and urine. The Viet Cong also ordered the use of glasses to protect the eyes; motorcycle goggles, if obtainable, were considered the best. The Viet Cong were instructed in protective measures only in a general way; each individual was to make his mask at his own expense. As a minimum, each Viet Cong carries a handkerchief, which he wets and uses in case of danger from gas. The captured masks fabricated locally by the Viet Cong are crude in appearance, and their effectiveness is questionable. The mask has a hood shape with a drawstring at the neck, a piece of polyethylene plastic at the eyes, a six-ply-sandwich filter pad of gauze and cotton batting at the mouth area, with a small quantity of charcoal or other granular material dispersed between the inner gauze layers throughout the batting (fig. 9 and 10).

(U)
(3) ~~(C)~~ In late 1965, reports referred to an experimental-stage "gas" mask made of transparent plastic and designed to cover the entire head. The neckband and the nose and mouth piece consisted of a large cloth bag having numerous smaller bags inside. Each small bag contained cotton compresses and charcoal powder. Use of this type of mask would be limited to those instances of small volumes of light poisonous gas. An additional disadvantage would be that normal breathing would blur the inner side of the plastic eyepiece and obscure the sight. The disadvantages imply that extensive research would be needed for more practical utilization of this mask against either gases or biological agents.



(U)
Figure 9 ~~(C/NFE)~~. Viet Cong locally fabricated protective mask (U).



(U)
Figure 10 ~~(C/NFE)~~. Interior of protective mask used by Viet Cong (U).

(4) (U) A Soviet ShM-1 helmet mask and the MO-2 canister were captured in a like-new condition in the vicinity of Ca Mau in early 1966. This item is the standard Soviet Army protective mask, a hood-type model which completely covers the head. Two rubber deflector tubes, separate or molded into the facepiece, direct influent air against the inside surface of the circular glass eyepieces. Inlet and outlet valves are in one housing; later models have an additional valve integral to the facepiece or mounted with an adapter. The complete assembly, along with a protective cape, antidim lenses, and an antigas kit, fits into a compartmented canvas carrier with shoulder and waist carrying straps. This discovery, the first time that a Soviet mask and canister had been captured in Ca Mau, indicates that the Viet Cong and the North Vietnamese receive some protective equipment from the U.S.S.R.

(U)
(5) ~~(C)~~ Impermeable type protective suits have been reported, supposedly for use against any type of agent except phosphorus and atomic radiation. Of the two types of suits reported, the design was the same, but the materials differed. One was made of rubber, and the other was made of two layers of cloth, treated between the layers with an unknown chemical which looked like tree sap. Both suits were described as being of three-piece construction: a head piece, a pullover jacket with nondetachable mittens, and a pants section with nondetachable boots. The suits were in limited supply, and only a short period of training was given in their use.

(U)
b. ~~(S)~~ Vaccines, Sera, and Antibiotics.

(U)
(1) ~~(C)~~ North Vietnam lacks a developed pharmaceutical industry and must depend on extensive foreign assistance. The output of pharmaceuticals is inadequate for peacetime needs and must be supplemented with heavy imports. Although the Communist countries are believed to account for most of North Vietnam's pharmaceutical imports, Japan, France, Italy, the United Kingdom, West Germany, and other free-world countries provide important additional supplies of pharmaceuticals to Hanoi. Production consists largely of repackaging and processing bulk pharmaceuticals imported from the Communist countries and the free world. The manufacture of modern pharmaceuticals such as antibiotics, vaccines, and sera reportedly takes place, but the output appears to be limited. North Vietnam's pharmaceutical industry consists of some 25 plants which are administered by a branch of the Ministry of Public Health. The majority of these facilities are little more than pharmacies performing basic compounding, packaging, and distribution of common pharmaceuticals. Small plants are located in 15 of North Vietnam's 27 provinces, and several are located in or near Hanoi. Antibiotics reportedly are produced at Pharmaceutical Products Plants No. 1 and No. 2, but the fermentation capacities of both plants probably are small. Vaccines are produced mainly by three of the larger plants, including the Veterinary Drug Factory, which was built with Chinese Communist assistance in 1963.

(U)
(2) ~~(S)~~ Pharmaceutical plants of importance in North Vietnam include the following: A plant near the Bach Mai Hospital in Hanoi employs about 500 persons.

The plant is comprised of several one- to three-story buildings, one of which is a warehouse. The plant moved to this location about 1960; previously it had been housed in a single one-story building in the immediate neighborhood of the Phu Doan Hospital in the center of the city. The two other major pharmaceutical plants in North Vietnam consist of one in Haiphong (similar to that in Hanoi) and a smaller one in Vinh. A report on the laboratories stated that none of the plants was capable of detailed laboratory work, that all raw materials were imported, and that no laboratory facilities existed for original research and development.

(U)

(3) ~~(S)~~ Although Hanoi recently announced its intention to achieve eventual self-sufficiency in production of medicines, officials did not indicate specific plans for expansion of the pharmaceutical industry. Since North Vietnam lacks the capability to construct the equipment used in output of modern pharmaceuticals, expansion would depend upon considerable foreign assistance. That such assistance will be of sufficient volume to permit significant expansion in the near future seems unlikely.

(U)

(4) ~~(C)~~ An active immunization program by the North Vietnamese Army consists of vaccination for each soldier against typhoid, cholera, plague, and smallpox. The North Vietnamese Army also supplies the Viet Cong with these vaccines. North Vietnamese troops receive vaccinations and pills once every 3 months. Viet Cong troops receive the vaccination and pills during each summer session.

(U)

26. ~~(S/NFD)~~ DECONTAMINATION

(U)

a. ~~(S/NFD)~~ As an overall public health measure, the North Vietnamese are establishing health protection units to increase hygiene, sanitation, and epidemiology standards. The Ministry of Public Health and the Malaria Elimination Central Board employed Soviet and Rumanian experts to train more than 50,000 native workers to combat malaria. The Soviet Union is expected to furnish the necessary appliances and medicines.

(U)

b. ~~(C)~~ Captured Viet Cong documents discuss biological weapons and outline measures for prevention of diseases. Available decontamination methods consist of using oil or gasoline to burn the infected area or enemy equipment. Troops engaged in the decontamination activities are to use masks and protective clothing and are instructed to bathe and to change their clothes when decontamination procedures are complete. Medical and Civil Health Sections are ordered to send any disease vectors that they might find to an agency that can classify them into categories to be used as documentary evidence. According to the Viet Cong, any new or strange insects are a sign of the use of biological weapons. The Viet Cong documents on BW protection also stated the following: "Presently we have no means to classify microbes into different categories so we keep them only after they are sterilized (for accusation)." With regard to preventive measures to be used against biological weapons and epidemics, the documents state: "To limit the area of contamination of a biological weapon (220 meters radius area)

which is dropped by the enemy, use all means to disinfect and sterilize. Urgently give training on the symptoms of disease and the treatment so that disease can be diagnosed and experiences gained in treatment. This will limit the danger of an epidemic. Immediately report to the responsible agency to get the necessary information for units and agents. We (Viet Cong) need the following information:

(1) Date and place where biological weapons are dropped (or appear),

(2) Type of biological weapons (bomb, equipment, aerosol or insects),

(3) Any diseased people or animals and the progress of the disease--light, serious, or has death resulted and treatment (successful or unsuccessful),

(4) What prevention is being used, and

(5) Report the contaminated area and enclose a map noting the following: diseases which are transmitted from one person to another; note the name of the identified epidemic and the date. For example DT 8/10/64 (Cholera 8 October 1964). Diseases which are transmitted from animals to people: same as above. Diseases which are transmitted by insects to people: map with the location of the infection."

(U)
c. ~~(C)~~ The extent to which the Vietnamese can conduct the above procedures has not been determined. This information, however, does indicate their awareness of BW and their interest in establishing defensive measures.

(U)
C. ~~(C)~~ NORTH KOREA

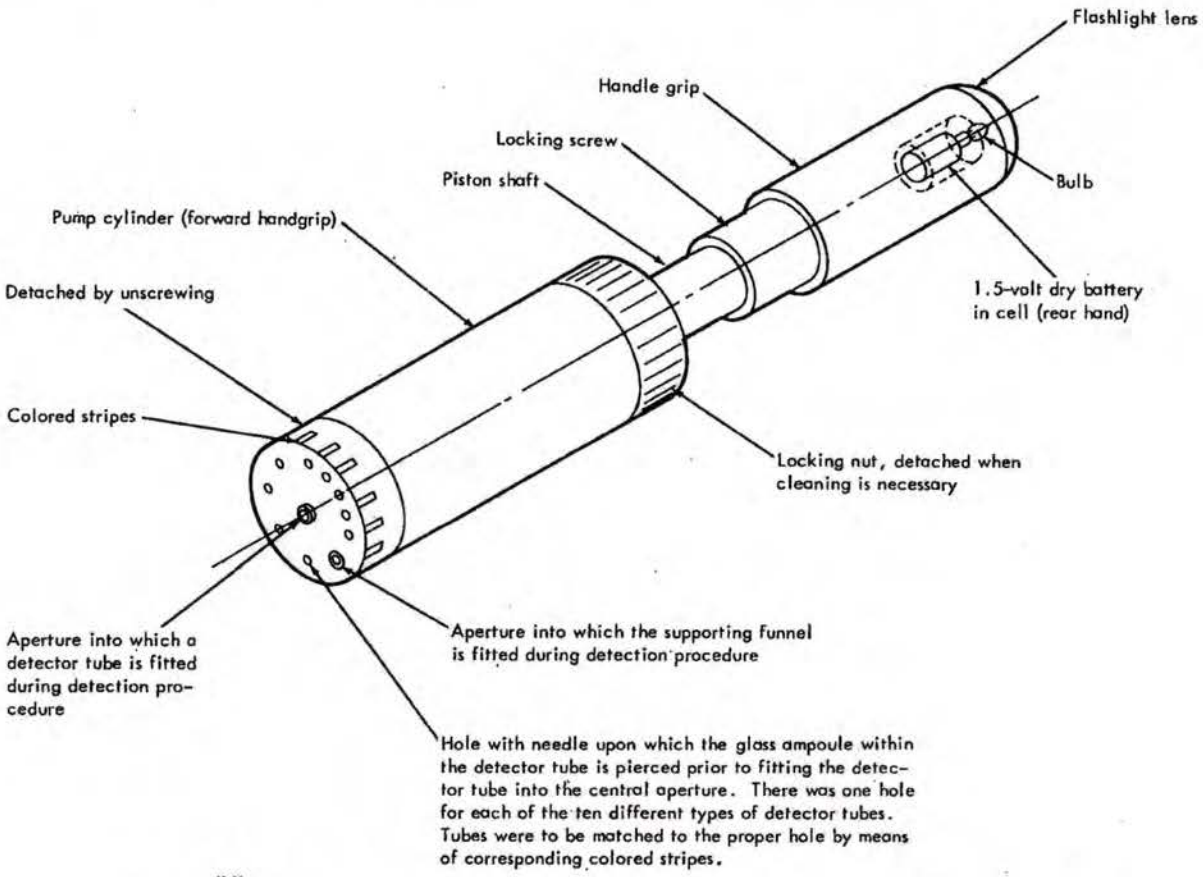
(U)
27. ~~(C)~~ GENERAL

North Korean literature on BW research and development contains some evidence of a BW defensive program, although information gaps are prevalent. Publications by the General Staff Department, Ministry of National Defense, state that "Biological Warfare" throughout the North Korean Armed Forces is the responsibility of the Medical Bureau, General Rear Service Bureau, Ministry of National Defense, and that the Medical Staff officers of all major commands are responsible for planning defensive tactics against enemy BW. Local BW defense was reportedly established by the Ministry of National Defense during the Korean War. This action was undertaken to uphold the propaganda campaign accusing the United States of using BW and to stimulate the native populace into improving their public health conditions.

(U)
28. ~~(C)~~ DETECTION SYSTEMS

Recent reports have identified a device for possible use in detection of BW agents (fig. 11). The device is one of several items contained in the Soviet PKhR-54

detector kit. The kit was recently found in North Korea and is also known to be available in Communist China and North Vietnam. Figure 11 shows the metal suction pump apparatus which is used with glass or plastic indicator tubes, and to which funnels or filters may be fitted. Exploitation of the device in the United States revealed that possibilities exist for use of this apparatus in detection of BW agents. The kit also includes a trowel, sample-collecting jars, and various other related items.



(U)
Figure 11 ~~(C/NFE).~~ Metal suction pump apparatus for use in BW agent detection (U).

(U)
29. ~~(C)~~ BW PROTECTION EQUIPMENT AND SUPPLIES

a. North Korean troops are believed to have limited supplies of protective equipment, including masks and clothing of Soviet design. North Korea is not known to be developing their own protective equipment.

b. The North Koreans have limited supplies of vaccines and sera, but no information is available on production capabilities. A biological research facility,

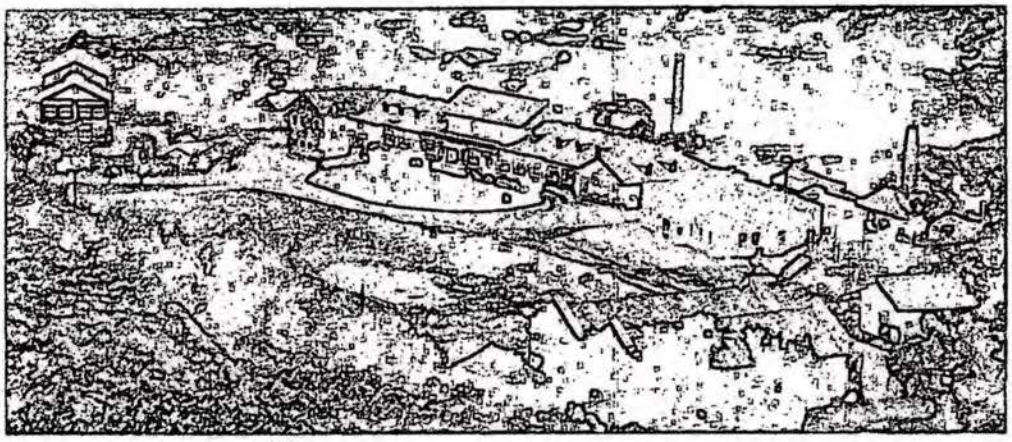


Figure 12 (U) ~~(C)~~. North Korean biological research facility, Yuhan Pharmaceutical Plant (U).

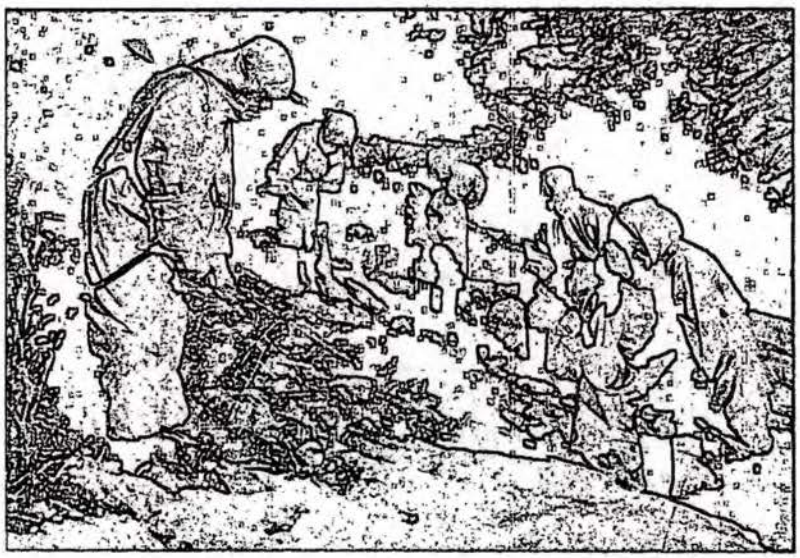


Figure 13 (U). North Korean biological decontamination procedures (U).

stated to be the Yuhan Pharmaceutical Plant (37°29' N., 126°47' E.), is shown in a 1963 photograph (fig. 12), but is not further identified as to the type and caliber of its activities.

(U)
30. ~~(C)~~ DECONTAMINATION

Data concerning decontamination equipment, materials, and procedures are lacking. Items remaining from the Korean War are probably still in existence; whether advancements have been made is unknown. Figure 13 shows military personnel in an exercise spreading insecticide in an infected area, reportedly to counteract the "germ" warfare conducted by the United States. This indicates some type of North Korean capability for decontamination procedures for use in BW defense. The current level of technology, production, and outlook for the future cannot be ascertained.

APPENDIX (U)

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13. ABSTRACT

The purpose of this study is to present information on the BW-related research and development programs of the Asian Communist Countries and to assess the capabilities of these countries to conduct offensive and defensive BW activities based on microbiological research with pathogenic viral, bacterial, and rickettsial agents; the programs and competence of the scientific personnel and the institutes involved; disseminating devices and techniques; and advancements in detection, identification, and prevention of infectious diseases of public health and military importance. Information from intelligence reports, intelligence studies, open literature, and contributions from counterpart Department of Defense agencies was used in making this overall assessment. ~~(C)~~ (U)

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14. KEY WORDS	LINK A		LINK B		LINK C	
	ROLE	WT	ROLE	WT	ROLE	WT
BW agent						
BW-related research and development						
BW facility						
BW agent dissemination						
BW agent detection						
BW weapon /munition						
BW defense						
BW protective equipment						
Immunization						
Vaccine and sera						
Decontamination						
Aerosol						
Insect vector						
Germ warfare						
Biological warfare						

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