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OFFICE OF STRATEGIC SERVICES
WASHINGTON, D. C.

AUG 4 1945
y/c SAD Monthly

3 August 1945

MEMORANDUM

TO: Lt. Col. John M. Jeffries, Chief, Research & Development Branch

FROM: Captain Donald B. Summers, Chief, Special Assistants Division, Research and Development Branch

SUBJECT: Monthly Report--July 1945--Special Assistants Division of Research and Development Branch

1. Herewith attached is the subject report.

Donald B. Summers, Capt., CWS
Chief, Special Assistants Div.
Research & Development Branch

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Encl: subject report.

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**MONTHLY REPORT--JULY 1945
SPECIAL ASSISTANTS DIVISION
RESEARCH AND DEVELOPMENT BRANCH**

I GENERAL

Because Research and Development Branch as such is being discontinued as of 31 December 1945, this laboratory is to receive small items of chemicals and materials from MRL. Additional shelves have been requisitioned but as yet have not been installed in the basement of Central Building for the purpose of storing these materials.

II PERSONNEL STATISTICS

1. Employed in Washington:

| | |
|----------------|-----------------|
| Administrative | 1 |
| Technical | 2 $\frac{1}{2}$ |
| Secretarial | 1 |
| Clerical | 0 |
| | 4 $\frac{1}{2}$ |

2. Captain Richard H. Forbes, O 194377, has been assigned for half time from Technical Division to Special Assistants Division. He is on duty at Special Assistants Division on Thursdays, Fridays, and Saturdays.

III GENERAL PROGRESS AND ACHIEVEMENTS

a) Supply--Ten requisitions were made on Civilian Purchase and Military Supply, for equipment and supplies required for development work in this division.

b) General:

1. BBC Pencil--Work is continuing at Merck & Company.
2. "L" Tablet--A material is available in this division for use of OSS if desired.
3. "K" Tablet--Work is continuing at Squibb and Company under the supervision of the Medical Branch. No results have as yet been reported.
4. CO₂ Gun--Acceptance Trials have been run during the last month and the gun was demonstrated to several different interested persons and groups. Groups outside of OSS interested in the CO₂ gun are the Marine Corps and the Air Corps. The Acceptance Trials will be completed this next month and a report written. Revised requirements from the various branches have been received and forwarded to the Requirements Committee. As yet no action has been taken by the Requirement Committee. These revised requirements total ten (10).
5. TD--The Medical Branch is still collecting data on the physiological effects of this material. It is expected that a member of Special Assistants Division will attend some trials the latter part of August and the first part of September.
6. SN--Two of the Class A Inks, mentioned in the June report as being unsatisfactory under prolonged storage, have been stabilized by a minor modification. An additional Class A ink seems to be available. This new method is being investigated as to its stability under various conditions. One of the A methods turned over to OSS by NDRG had proved unsatisfactory, and Special Assistants Division received another method in its place. There are still three New A methods yet to be tried pending the arrival of certain requisitioned items.

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It appears that one new C method will be available using materials in the medical kit. Work is still continuing on the investigation of these C methods. The program of intensified search for additional C Class methods is being continued. Some of the possible methods are being held up because of lack of procurement.

Several D methods and several E methods are possible with the use of the medical kit.

Lt. Ralph A. Nelson, Technical Division, Research and Development Branch was given instructions in one Class D method.

Information was prepared on the lower class inks for use by C&D. It is planned to train one or two men who are going overseas shortly in six (6) D and E methods for use by C&D.

The underwater writing instrument, information for which was requested by MU, was developed in Argentine. The Quartermaster Corps has procured 25,000 of these items and is carrying out investigation on the instrument in coordination of several civilian concerns. It is expected that these instruments will be on the general market sometime in the near future.

The use of "Pats" is still being investigated by this division. Several minor difficulties have yet to be overcome in order to make the use 100% satisfactory.

7. Phosphorescent Ink--A satisfactory ink has been found which is invisible in daylight but can be read in darkness with the use of a Ultra-violet transmitting lens attachment on the GI flashlight. This lens may be procured from a commercial concern. Special Assistants Division has enough material available to make up about one gallon of this special ink.

8. Toxics--This division has now available a toxic which will produce extreme illness in man but is definitely not fatal. This material could be put up in pills, capsules, or powders for use by our agents. The effects of the material will take place approximately two hours after ingestion, and will continue for six to eight hours. The victim will be totally incapacitated and will be afraid he will die or perhaps he will be afraid that he will not die.

Another suitable toxic, harmless on ingestion but lethal subcutaneously, is available from a commercial source. Although the price of this material is relatively high the cost per dose is relatively low. Two or three other toxics are available from Chemical Warfare Service which are lethal in very minute doses either orally or subcutaneously. The last three materials mentioned would be put up in suitable form for use by our agents.

9. Document photography--The investigation of this item has boiled down to one of suitable mechanical manipulations. SI and X-2 have expressed their ideas on the subject. It is planned that the item shall be made up in tablet or notebook form with certain minor modifications. These modifications are now being investigated.

10. BW--It is understood that the Joint Chiefs of Staff have given their approval to the use of plant BW provided the theatre commander wishes to use it. In view of this attitude this division has planned several items which can make use of the material available from Chemical Warfare Service. This would necessitate, however, the use of a machine shop and a carpenter shop. If desired this division will proceed with such investigations. Intelligence, both defensive and offensive, is being maintained on the other phases of BW.

11. Gold Dust--A material which had been developed by TVA has been received. Certain field tests are to be carried out during the month of August. Unless there is specific demand after these tests, the file will be closed.

12. Miscellaneous--a) Comparative tests on silence, penetration, and dispersion were run on all silenced weapons developed by Research and Development Branch.

b) Information was received from X-2 pertaining to a German poison cigarette lighter. No technical data was given but photographs were enclosed.

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c) A pellet was received from X-2 which was presumed to be poison. This material was analyzed and found to be a harmless, sugar-coated laxative pill, commonly used in continental Europe.

d) Samples of Barralyme and soda lime were received from Technical Division, Research and Development Branch for analysis. This analysis is now being performed.

e) Photographs and reports of an item, thought to be of sabotage nature, discovered in this country by G-2, was discussed with a member of the War Department. It was the consensus of opinion, even though there was extreme lack of technical information, and this item was a standard commercial flare.

f) Some photographic development and printing was carried out for MRL.

g) Lt. Ralph A. Nelson, Technical Division, Research and Development Branch, was given information pertaining to certain available items of the Special Assistants Division.

IV COMMENDATIONS

Pvt. Robert M. Loftfield should again be mentioned for his initiative in carrying out investigations pertaining to SW. It is hoped that Pvt. Loftfield may receive a promotion before severing relations with this division.

V DIFFICULTIES

In view of the discontinuance of Research and Development Branch as such on 31 December 1945, it is hoped that the work of this division might be maintained under another supervisory branch. It is felt that the work of this division should be continued because of the following reasons:-

1. The post hostilities use of SW. There is no other single place in the United States where investigations, both offensive and defensive, instruction and materials are available.

2. The possibility, that if the war is not over by that time that, BW and CW might be still used.

3. This office would be the only source of accurate, scientific, and technical information in an advisory capacity in OSS.

4. This office would offer complete analytical facilities under proper security throughout OSS.

5. With already existing facilities now present, the maintenance of such facilities would be relatively inexpensive.

6. It is the opinion of this office that certain investigations even though offensive in nature should be carried out throughout peace time.

It is suggested that if the work of this division is to be continued such supervision should be, either under the Office of the Director, which make the services available to all branches equally, or, under SI, in as much as most of the present work is being utilized by SI.

Donald B. Summers, Capt., CWS
Chief, Special Assistants Div.
Research & Development Branch

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SUMMARY OF ACTIVITIES OF
SPECIAL ASSISTANTS DIVISION, R&D

1 January 1945 to 15 August 1945

I GENERAL

1. Obtained books, equipment and materials to increase general chemical laboratory service.
2. Setup the laboratory to function for chemical analysis.
3. Setup and maintained a complete cross indexed filing system for all correspondence, requisitions, equipment, books and materials.
4. Maintained special secrecy regulations.
5. Increased the division by one and one-half (1½) man weeks.
6. Determined the cost of laboratory installation and maintenance.

II INTELLIGENCE

1. Kept informed as to advances made in enemy BW through SI Branch, R&D Branch, CID Branch, GWS and the Assistant to the Advisor to the Secretary of War.
2. Kept informed as to advances made in allied BW through SI Branch, R&D Branch, CID Branch, GWS, and the Assistant to the Advisor to the Secretary of War.
3. Prepared plans for utilizing BW for OSS in case such a program was authorized.
4. Visited areas where BW research and development was being performed and maintained contact with proper personnel.
5. Prepared to use plant BW and obtained authorization for use.
6. Kept informed and maintained files of enemy CW through R&A Branch, SI Branch, X-2 Branch, CID Branch, British sources, GWS, NDRC, OSRD, CMR, ONI and G-2.
7. Kept informed and maintained files of allied developments in CW through Ordnance, R&A Branch, SI Branch, X-2 Branch, CID Branch, British sources, GWS, NDRC, OSRD, CMR, ONI, and G-2.
8. Kept informed and maintained files of enemy sabotage items of chemical nature through R&A Branch, SI Branch, X-2 Branch, CID Branch, British sources, GWS, NDRC, OSRD, CMR, ONI, and G-2.
9. Kept informed and maintained files of enemy SW through SI Branch, R&D Branch, NDRC, OSRD, ONI, the Bureau of Censorship and B&D Branch.
10. Kept informed and maintained files of US development of SW through OSRD, NDRC, the Bureau of Censorship and our own development.
11. NOTE: This division has the most complete information of SW of

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place in the United States. Other offices only have particular phases.

III INFORMATIONAL SERVICES

1. Sent formulas, materials and directions for the use of phosphorescent and fluorescent items to CBI at request of the CBI Commanding Officer.
2. Gave technical information pertaining to waterproof materials to MRL at the request of MRL.
3. Gave technical information pertaining to alcohol, gasoline and water resistant lacquers to Technical Division of Research and Development Branch at request of Technical Division.
4. Gave technical information pertaining to colored flares to Technical Division of Research and Development Branch at the request of Technical Division.
5. Gave technical information pertaining to a German incendiary to Technical Division of Research and Development Branch at the request of Technical Division.
6. Sent detection of SW information to METO, ETO and CBI at request of the respective Commanding Officers.
7. Obtained information pertaining an underwater writing instrument at the request of BU Branch.
8. Gave information of the items devised by Special Assistants Division to three members of SI Branch going overseas.
9. Advised G-2 as to the possible source of an incendiary materials suspected as having been used as a sabotage item.
10. Gave information of the items devised by Special Assistants Division to three members of Technical Division, Research and Development Branch going overseas.
11. Advised Field Photographic Branch pertaining to photography, nomenclature and description of certain items produced by Research and Development Branch
12. Gave information of the items devised by Special Assistants Division to a member of MO for use by MO Branch.
13. Advised members of Technical Division of Research and Development Branch as to proper nomenclature of certain scientific equipment.
14. Obtained parachute locators for Technical Division of Research and Development Branch.

IV TECHNICAL SERVICES

1. Tested, devised and wrote directions for use of stripping film at the request of the Camouflage Division of Research and Development Branch.
2. Tested and advised against the use of a fluorescent powder suggested for

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use by a member of the Air Corps.

3. Tested, decontaminated and repackaged a leading container of a chemical agent stored at Rosslyn.
4. Prepared special programs for the use of a Research and Development Branch demonstration.
5. Analysed a German secret ink at the request of X-2 Branch.
6. Demonstrated two Special Assistants Division items at a Research and Development Branch demonstration.
7. Photographed, developed, printed and distributed pictures of a Research and Development Branch demonstration.
8. Photographed and printed pictures of certain Technical Division, Research and Development Branch items at request of Technical Division.
9. Compared the relative merits of two silent weapons--one developed by Special Assistants Division and one developed by a civilian.
10. Analysed a suspected poison pellet for X-2 Branch.
11. Analysed samples of soda lime and Barralyme at the request of Technical Division, Research and Development Branch.
12. Printed photographs at the request of MRL to aid in the liquidation of MRL.
13. Investigated possibilities of making certain pills at the request of the Medical Branch.

V PROJECTS

a. Complete:

1. X-Well--Completed 500 procurement, originally requested by Mr. Lovell. 490 are now stored at Edgewood Arsenal and 10 were expended in tests.
2. OH Sparklet--Completed 4500 procurement, originally requested by Mr. Lovell. 2000 were sent to EFO, 2000 sent to CBI, 200 were expended in tests, 100 were originally available at Special Assistants Division, some of which have been expended in demonstrations, and the remainder are stored at Edgewood Arsenal.
3. Frangible Grenade--Parts for 1500 units were procured which were originally requested by Mr. Lovell. The parts consist of 1500 glass containers, 1500 paper discs, 350 tin cans, 350 detonator blocks and 350 rolls of adhesive. The agent filling, if used, was to be procured by requisition from GWS. The detonator blocks and adhesive tape are stored in Special Assistants Division and the other materials at Rosslyn.
4. TB--a) One thousand 1 oz. vials were filled with TB agent at the original request of Mr. Lovell and are now stored at Edgewood Arsenal.
 b) One thousand 50cc ampules were filled with TB agent at the original request of Mr. Lovell and are now stored at Edgewood Arsenal.

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5. PB--Two hundred and fifty (250) 5 cc ampules were filled with one material and two hundred and fifty (250) 2 cc ampules were filled with another material, originally requested by Mr. Lovell, and are now stored at Edgewood Arsenal.

6. TB Sparklet--Five hundred (500) were in the process of being filled but the contract was cancelled.

7. VG--One thousand (1000) 5 cc ampules were filled, at the original request of Mr. Lovell, and are now stored at Edgewood Arsenal.

8. BG--Five thousand (5000) 0.7 cc ampules were filled, at the original request of Mr. Lovell, and are now stored at Edgewood Arsenal.

9. Belcher--Preliminary investigations of literature and materials were made and tests were run on human subjects. Because of an unsatisfactory human reaction the project was dropped.

10. Stinger Dart--Plans and experimental models were made for a very small spring driven dart. Three models were made but the preliminary tests were not satisfactory so the project was dropped. This project was carried out with the aid of NDRG at NRL.

11. Carbon Dioxide Gun--This item was developed at the request of the Field Experimental Unit. All of the plans, development, specifications, tests, supervision, and distribution were carried out by Special Assistants Division. Fifteen (15) of the items were procured for an original order from Field Experimental Unit with ten (10) others still to be obtained of the original fifteen (15). Twelve were furnished to Field Experimental Unit, two to Procurement Branch and one to Research and Development for test purposes.

b) Incomplete

1. BBC Pencil--Two thousand (2000) of these items were being filled at the original request of Mr. Lovell. This item will have to be discontinued when Research and Development Branch is liquidated unless finished before 31 December 1945.

2. Phosphorescent Ink--At the request of the Communications Branch, an ink, invisible in daylight but visible in darkness, was developed. Material is available in Special Assistants Division for making one gallon of ink. When Research and Development Branch is closed this ink will not be available.

3. Gold Dust--At the request of Mr. Stone, Special Assistants Division with aid of TVA, developed incendiary pellets which are spontaneously inflammable in air. Approximately one quarter pound of this material was produced for field tests. If these field tests are not finished before Research and Development Branch liquidates, the project will be incomplete.

4. Rocket Dart--Preliminary tests were run on a small arrow shaped projectile powered within the projectile by gas pressure. This idea was conceived at the time when the order was given that Research and Development Branch was to liquidate. Therefore, the investigation stopped.

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5. L Tablet--At the original request of Mr. Lovell and in conjunction with the Medical Branch, a lethal pill was investigated as to material content, pellet making qualities, and rapidity of solution. This investigation would stop when Research and Development Branch liquidates unless the Medical Branch continues the investigation.

6. X Tablet--At the original request of Mr. Lovell and in conjunction with the Medical Branch, a "knock out" tablet was investigated as to its size, pellet making qualities, taste, color, and rapidity of solution. This investigation would have to be stopped unless the Medical Branch continued the investigation.

7. YD--At the request of Mr. Lovell and later at the request of the Director, this item was investigated with the aid of the Medical Branch. When Research and Development Branch liquidates, the responsibility would fall entirely on the Medical Branch.

8. Document Reproduction--At the request of SI, a device is being developed for photographing exposed classified documents in any source of light without the victim being aware of the operation. Unless this project is completed before the liquidation of Research and Development Branch, it will have to be dropped.

9. Toxics--At the suggestion of this division, information and material was collected as to physiological action, rapidity of action, method of application, stability in storage and availability of over 150 different toxic materials. Some animal experiments were performed. This information and material was obtained with the aid of NDRG, CWS and private sources. There is available in Special Assistants Division small quantities of twenty-four (24) different toxics and twenty-seven (27) others could be requisitioned easily from the proper sources. This investigation would have to discontinue upon the liquidation of Research and Development Branch.

10. SW--This project is the largest and most extensive of all undertaken by Special Assistants Division, fifty percent (50%) or more of the man-hours are spent developing this project. As a result, the Special Assistants Division has the most extensive information and laboratory techniques of any other office in the United States. NDRG, the Bureau of Censorship, many college laboratories, commercial concerns, and private individuals all have their special phases and contribute the information and techniques to this division. Extensive investigation of new methods of offense and defense are also carried out in this laboratory along with the testing of all methods, aging qualities and suitability of those by other laboratories.

To date the following methods have been received or developed:

Six A methods have been received from NDRG, Harvard University, California Institute of Technology and Eastman Kodak Company. One A method has been developed in Special Assistants Division and seven others are being investigated. It is understood that NDRG has three or four A methods not officially released to OSS.

Two B methods have been received from NDRG. Three others are being investigated by Special Assistants Division.

Two C Methods have been received from NDRG; one C method from the Bureau of Censorship; and NDRG is committed to furnish three more C methods. Two C methods were developed in Special Assistants Division with at least twelve (12) more

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being investigated.

Eleven D methods have been received from outside sources--one from NDRC and ten from the Bureau of Censorship. Three were developed in Special Assistants Division with approximately twenty(20) others under investigation.

Approximately 100 E methods have been obtained from all sources.

A total of twenty-seven (27) methods have been released with the Special Assistants Division furnishing the materials for overseas use and giving suitable training in techniques and use. The distribution is as follows:

One B method, three C methods, nine D methods and fourteen E methods. Representatives of the following branches receiving these materials and instruction have been SI, R&D C&D, MO, Communications, X-2, and Documentation Branches.

Of special note is a method of sending a message hidden under a typewritten period, comma or other punctuation mark. This process was developed in Special Assistants Division entirely without outside aid or help from any source.

Also methods of utilizing a standard issue field medical kit as a source for SW material were worked out in Special Assistants Division and NDRC, some college laboratories and some commercial concerns. These possibilities were investigated at the suggestion of the Special Assistants Division.

All of the work on SW, which would be of considerable use now and in the peace time to come, would cease when Research and Development Branch liquidates.

VI MISCELLANEOUS ITEMS

Information has been received from X-2 and plans made to utilize a device copying a German poison cigarette lighter.

Arrangements were made with CWS to store all of Special Assistants Division items of chemical nature at Edgewood Arsenal. A magazine, number 890 Bush River Area, available only to a properly authorized person (Chief, Special Assistants Division) in OSS and to the Safety Officer (Building 15, Edgewood Arsenal) is assigned to OSS. One key is at Edgewood Arsenal, one key is with the OSS Security Office, one key is with the Chief, Research and Development Branch and one key is with the Chief, Special Assistants Division, Research and Development Branch.

At least ten ideas have been listed and filed in the Special Assistants Division safe to be investigated as sabotage possibilities but no work has been done nor will be done unless this type of work continues throughout peace time.

Allotments of various methods of SW have been made to SI Branch for their exclusive use provided the proper authority is obtained.

Donald B. Summers, Capt., CWS
Chief, Special Assistants Div.
Research and Development Branch.

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OFFICE OF STRATEGIC SERVICES
WASHINGTON, D. C.

27 September 1945

MEMORANDUM

TO: Lt. Col. John M. Jeffries, CH
Chief, Research and Development Branch

FROM: Capt. Donald B. Summers, CWS
Chief, Special Assistants Division, R&D

SUBJECT: Final Summary Report

1. Herewith attached is the final summary report on BW, submitted from Special Assistants Division, Research and Development Branch.

2. This report completes all the final summary reports to be submitted from this division with the exception of SW which is being completed by Lt. Frederick B. Johnston.

Donald B. Summers, Capt., CWS
Chief, Special Assistants Div.
Research and Development Branch

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SPECIAL ASSISTANTS DIVISION, R&D

FINAL SUMMARY REPORT OF BW

28 September 1945

INTRODUCTION

Authorization: There is no letter of authorization in the Special Assistants Division files but it is understood from Major A. Gregg Noble, former Chief of Special Assistants Division, and from Captain Donald B. Summers, present Chief of Special Assistants Division that such authorization was given orally by Mr. Stanley P. Levell, former Chief of Research and Development Branch and also by Lt. Colonel John M. Jeffries, present Chief of Research and Development Branch.

Purpose: It was desired that OSS be aware of all possible developments both offensive and defensive made in the U.S. and in foreign countries and that Research and Development of OSS be in a position to recommend and make suitable BW devices should the opportunity present itself.

MATERIALS AND EXPERIMENTAL METHODS

Materials: All sources of intelligence were used involving the OSS Branches of SI, I-3, R&A, and the Medical Branch as well as the assistant to the Special Advisor to the Secretary of War, GWS in its Special Project Division, NDRC, ONI and any private sources available.

Experimental Methods: Literature, correspondence and data were collected, abstracted and consolidated into files from the sources mentioned. There was no actual experimentation done in Special Assistants Division but visits were made to the stations where such work was done. Discussions and conferences were had with the proper authorities. And finally tentative plans and devices were designed to include BW in the OSS scheme of activity.

RESULTS

Special Assistants Division, upon proper authority, was ready to develop BW devices; information was available upon enemy activity and developments; (See Appendix A); information was collected on U.S. developments; and two agents were collected to be stored in the Special Assistants Division Laboratory. (These two agents were X and SA) (See Appendix B).

CONCLUSIONS

OSS could wage BW both against plants and animals in a relatively short time.

RECOMMENDATIONS

It is suggested that anyone desiring detailed information on this subject both defensively and offensively contact the Chief, Chemical Warfare Service, Attention Special Projects Division.

NOTE: No detail is given in this report since this project will continue under the jurisdiction of GWS during peacetime.

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Donald B. Summers, Capt., ONS
Chief, Special Assistants Div.
Research and Development Branch

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FINAL SUMMARY REPORT OF BW

APPENDIX A

SUMMARY OF ENEMY ACTIVITY

GERMANY

Up until the final surrender of Germany in May a constant stream of reports were issued telling of BW activity in Germany.

In general, the BW material of offensive nature mentioned most frequently were those of bubonic plague, foot and mouth disease of cattle, use of beetles against plants, choking weeds against plants, typhus, malaria, yellow fever, chicken cholera, rinderpest (cattle pest), Bang's disease, fungi and rusts against plants, anthrax, psittacosis, leprosy, small pox, paratyphus "G", Malta fever, tularemia, bacillus melitense, Ricketts, leptospiral spirochete, tuberculosis, and glanders.

It appeared during the first part of the war that the Germans made serious investigations toward the use of BW but decided that it was not practical. Thereafter, most of their attentions were focused upon the defensive side.

The work did not seem to be well coordinated because no man or installation seemed to be aware of any other activity. Top rating scientists were not available for the work as most of them were either in the Army or out of Germany because of religious beliefs. Several isolated installations were known off the beaten track and were kept well hidden and secure.

There was some but not extensive training carried out on defensive BW but knowledge of that nature was very slightly disseminated.

There is some evidence that allied prisoners of war and Jews were used for human experiments in the effects of certain bacteria and toxins and also more evidence that prisoners of war were used as guinea pigs for testing the defensive side of BW.

It seems that Germany was considerably less advanced in BW than the U.S. but this fact may be refuted upon future intensive investigation.

JAPAN

The Japanese had perhaps the best informed scientists in BW investigations of any nation in the world and as such were more of a potential threat in that direction than Germany. The Japanese investigations were extremely extensive and intensive so that some of the U.S. research utilized Japanese methods and techniques.

Even with all this intensive preparation there were very few BW agents mentioned in the various reports. These were cholera, dysentery, typhoid, anthrax, bubonic plague and glanders for animals and tylenohus tritici (against wheat), Puccinia glumarum (against barley, wheat and rye), Hillebrandia tritici (against wheat) and Phytophthora infestans (against potatoes) against plants.

There is no evidence of mass production of these agents, although experimental secluded installations were known. Of course, the Japanese had no scruples hindering them, as U.S. has, from the use of these devices but no large scale operations were expected. It was thought for a while that the balloons descending

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in the western U.S. from Japan might carry some infectious bacteria but none was ever discovered. They did have an experimental bacterial bomb which has never been proved used. The Chinese claim that infected rice grains, pellets and powders were dropped by Japanese planes followed by an epidemic of bubonic plague but that is not definitely proved.

The Japanese consistently tried to prove that BW was used against them by the Russians, Chinese, and the British Indian troops, but nothing ever developed from the accusation.

There was considerable defensive training given Japanese soldiers and many testing, vaccine, and defensive laborstones set-up.

All in all the Japanese may have used BW against China, certainly did extensive research in BW and although not as far advanced as U.S. could have made experimental attempts to utilize BW.

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FINAL SUMMARY REPORT OF BR

APPENDIX B

I POSSIBLE BR DEVICES FOR OSS USE AGAINST PERSONNEL

The selection of the proper BR agent narrows down to availability as only two are manufactured in anything like a suitable quantity. These two are "X" and "Y". Assuming that a lethal instrument is desired, the only one that can be considered is "X".

Consideration of the properties of "X" will give the limitations in its use. Although when freshly prepared the toxicity is very great, over a period of time (1 year) in moist storage, the value falls to about one quarter of its original toxicity. The material is stable dry or in a moisture proof container. The material is stable dry or in a moisture proof container, is soluble in water and could be incorporated in a water soluble wax like "Carbowax."

Under the circumstances this substance could be utilized in pills, pellets, or powders that could be given in drink or spread on food. It could be put on food stores or in water supplies provided these stores were to be utilized within six months. The dosage is so small that even increasing the amount by one hundred times, the total amount per man would be negligible.

Furthermore, by incorporating the material in "Carbowax" a bullet, dart, or arrow could be tipped with it and injected into a victim. If the shot itself was not fatal, the infection following would be. There is no known method of protection except to remain out of contact with the material.

The material maybe obtained from the Special Projects Division, GWS.

II POSSIBLE BR DEVICES FOR OSS USE AGAINST VEGETATION.

There are several agents which may be used against plant growth which are available in fairly large quantities. The substances are known as IR, E, and LN series. Of these LN 8 is at present the most satisfactory.

This material is a white crystalline solid which is very stable under most every condition. It is about 1% soluble in water, soluble in saturated aliphatic hydrocarbons, polyethylene glycol, and tributyl phosphate.

If a solution of it is put on vegetation, in one to three days the first effect is noticed in a withering and yellowing of the leaves. In a week to ten days the vegetation is completely stripped of its leaves, the stalks fall over and the plant dies or fails to bear fruit. It is particularly effective in a 1% oil emulsion against beets, rape, buckwheat, radishes, clover, beans, and rice. Incorporated with polyethylene glycol ("Carbowax") the effect is greater.

A most effective solution is made in the proportion of 3 pounds of LN 8 to four quarts of tributyl phosphate which is used as a standard. Then the field concentration is made by dissolving seven quarts of the concentrated solution in 100 gallons of Number 2 diesel oil. When sprayed on plants the amount of material effective is about 1-3 pounds of LN 8 per acre.

There are several means that could be used to disperse the agent in small quantities. A flit gun would be the easiest but a DDT aerosol bomb could be utilized so that a time pencil operated the jet.

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The LN 8 could be put in powders which could be placed in irrigation ditches or the LN 8 made into a pellet with "Carbowax" could be placed in irrigated fields.

Still another suggestion could be to place the powdered LN 8 with an emulsifying agent in a water soluble capsule and placing these units in fields.

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