

DEPARTMENT OF DEFENSE
 ARMED FORCES SPECIAL WEAPONS PROJECT
 P. O. BOX 2610
 WASHINGTON 13, D. C.

ADDRESS REPLY TO
 THE CHIEF, ARMED FORCES
 SPECIAL WEAPONS PROJECT

SWPEF/5/319.2

21 April 1954

MEMORANDUM THRU: CHIEF, WEAPONS EFFECTS DIVISION
 DEPUTY CHIEF OF STAFF, TECHNICAL SERVICES

FOR: CHIEF OF STAFF, AFSWP

SUBJECT: Report of Temporary Duty, 6 March 1954 - 17 April 1954

1. In accordance with SWPTO-73 dated 5 March 1954, as amended, the undersigned visited the following places between 6 March 1954 and 17 April 1954 for the purposes indicated.

2. (a) Kwajalein Island, 10 March to 13 April, local time, 1954, for the purpose of taking part in a bio-medical study of American personnel and Marshallese natives who had been subjected to fall-out as a consequence of the first test shot of Operation CASTLE.

(b) Persons visited:

RADM R. S. Clarke, ComNavStakwaj
 CDR William Hall, MedOff, NavStakwaj
 CAPT Dement, RadStaffOff, CINCPAC
 Col. C. S. Maupin, Staff Surgeon, JTF-7
 Major General P. W. Clarkson, C/JTF-7
 Col. Karl Houghton, Surgeon, SWC, KAFB
 Col. Paul Preuss, TU-13, JTF-7
 Dr. H. Scoville, Technical Director, AFSWP
 Mr. Jack Tobin, HiComTerPacIs
 Mr. Marion Wilds, HiComTerPacIs
 Dr. Marshall, Health Officer, HiComTerPacIs
 Dr. Reisenberg, HiComTerPacIs
 Mr. Lewis Strauss, AEC
 Senator Pastore, Joint Congressional Committee/AEC
 Representative Holifield, Joint Congressional Committee/AEC
 Mr. Allardyce, PIO, AEC
 Dr. Durant, Special Consultant, AEC
 Dr. John Morton, Atomic Bomb Casualty Commission
 Mr. Merrill Eisenbud, AEC

Declassified by DNA, Chief, ISTS

Date: 8/19/94

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3. (a) USNRDL, San Francisco, California, 15 April 1954, for the purpose of discussing radio-chemical biological studies being conducted on materials obtained from the patients and their environment.

(b) Persons visited:

CAPT Hinners, Director
Dr. Paul Tompkins, Scientific Director
All Laboratory Division Heads

4. (a) Sandia Base, Albuquerque, New Mexico, 16 April 1954, for the purpose of visiting the Base Hospital.

(b) Persons visited:

Brigadier General S. V. Hasbrouck, Chief of Staff
Colonel Walter L. Peterson, Surgeon, Sandia Base

5. (a) Los Alamos Scientific Laboratory, Los Alamos, New Mexico, 16 and 17 April 1954, for the purpose of discussing fission product studies on the urines of Project 4.1 patients, the neutron incapacitation project and personnel problems.

(b) Persons visited:

Dr. Wright Langham, H-4
Major Sam Rothermel, AFSWP
Dr. Payne Harris, H-4

6. (a) The undersigned accompanied the members of Project 4.1, leaving Washington, D. C., on 6 March and arriving on Kwajalein Island on 10 March, local time, 1954. Admiral Clarke requested that the project personnel assume immediate responsibility for all medical care of the Marshallese natives in addition to the primary function of studying these natives from the standpoint of determining the nature and degree of the radiation hazard to which they had been exposed. It was apparent that the problem of housing, feeding, and otherwise caring for 236 natives was putting a major strain upon all facilities of the Naval Station and in particular was beyond the capabilities of the medical staff. Accordingly, one clinical physician from Project 4.1 was assigned the exclusive responsibility of conducting sick call and assumed the function of family physician to the group. This officer was given specific directions to conduct his practice with the personal welfare of the individual as his prime consideration. Each patient was to be treated according to the best principles of medical practice without regard for the fact that he may or may not also have been

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subjected to ionizing radiation. This resulted in the early establishment of a personal relationship between the natives and the members of Project 4.1 and was largely instrumental in obtaining complete cooperation, not only from the patients themselves, but from the members of the Trust Territory Staff who remained in residence throughout the entire period.

(b) A complete report of this problem is presently being prepared by the Project personnel and it would be inappropriate to present a detailed study of the natives at this point. However, it might be well to describe briefly the more important facets of the problem. This group of natives received varying amounts of ionizing radiation from approximately 15R to 200R of Gamma radiation, depending upon the distance from the detonation. The natives from Rongelap Island described a visible fall-out which began at approximately H/6 hours and continued until H/18 hours. These individuals in particular showed a drop in the white blood cell count which indicated that they had been exposed to significant amounts of Gamma radiation. They developed skin lesions typical of Beta contact burns and further studies indicate that they also have an internal body deposition of fission products. The changes in the blood picture were accompanied by epilation and the appearance of Beta burns over varying portions of the body. There was a rough correlation between the degree and extent of the blood changes, the Beta burns, the internal deposition, and the distance from the detonation. Those individuals who bathed early or who were protected by clothing showed less severe and less extensive Beta lesions. All the natives were decontaminated prior to the arrival of the Project personnel but it required repeated washing, using Dreft and Tide, to reduce the contamination of the hair and the clothing to acceptable levels.

(c) In the light of the study conducted by Project 4.1, the presently accepted military tolerances for Gamma radiation may require some minor revision but it is rather surprising that previous predictions of physiological change within the limits studied seem to stand up.

(d) The Trust Territory personnel were initially highly upset regarding the situation and Mr. Jack Tobin, District Anthropologist, in particular, required constant reassurance and daily briefings on the condition of the natives. Mr. Tobin speaks Marshallese with some degree of fluency and it is our feeling that much of what was said in his presence was passed directly to the patients. Dr. Marshall, of the High Commissioner's Office, examined the natives with us and expressed himself as being satisfied with the manner in which they were being treated.

(e) The American personnel, totaling 28 in all, were returned to Kwajalein on 16 March. General Clarkson and his staff had been reluctant to turn these individuals over to the Project because of their poor

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psychological attitude and it was only at the insistence of the AEC that we were able to study these men. It was felt that no significant information regarding their condition could be obtained from a series of isolated studies made in different medical establishments and that it was to their best interest to have them placed under the care of Project 4.1. Blood changes in this group were relatively minor in extent and rather closely paralleled the calculated irradiation which these men had received. Beta burns occurred upon several individuals but were minor in extent and in no case approached the severity of the burns on the natives. At the completion of the studies of Project 4.1, it was recommended that these individuals be transferred in a body to a named General Hospital for such further tests as were necessary, in order to delineate the extent of the radiation damage to these individuals. While it was felt that such damage would be minimal in extent, it was our opinion that a complete work-up was justified.

(f) On 10 April 1954, Project 4.1 personnel attended a seminar at Eniwetok and presented the results of their study to an assembly of approximately 40 medical officers and allied scientists of the Task Force. Dr. Ziegler, Medical Officer of the BALROKO, presented his findings on the Naval personnel from that ship who had received Beta burns. This meeting was attended by Dr. John Morton of the Atomic Bomb Casualty Commission who presented his findings on the Japanese casualties from the Lucky Dragon. Dr. Morton visited Kwajalein and examined the Marshallese natives and the American personnel stationed there. It appeared that the lesions found in these many groups of individuals were closely comparable and that they were caused by the deposition of Beta activity on the skin.

(g) On March 15, Senator Pastore and Representative Holifield, members of the Joint Congressional Committee, accompanied by various members of the AEC Information Office conducted an informal hearing on Kwajalein Island. Commander Cronkite, Project Officer, Dr. Bond, Dr. Dunham, and the undersigned, presented their findings to this group. At that time there had been no epilation in the patients nor had any significant changes in the blood picture developed. As a consequence, the Senator received a much more optimistic impression of the general condition of the natives than was justified in the light of later developments.

(h) Mr. Strauss made a personal visit to the native compound somewhat later in the month and was able to examine some of the natives who had visible lesions.

(i) Rear Admiral Clarke and the staff of the Naval Station rendered their complete and unqualified cooperation to Project 4.1 at all times. Any and every request for assistance from Commander Cronkite was immediately answered.

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(j) The relations of Project 4.1 with JTF-7 were at all times strained. Coordination of logistics, security, and correspondence with the Task Force was barely satisfactory. General Clarkson showed a personal interest in the program and cooperated fully at his level. However, it was the feeling of the undersigned that the staff officers at his level had not been briefed on the problem and were not aware of their responsibilities towards Project 4.1.

7. USNRDL.

At the request of Captain Hinners, the undersigned briefly outlined for the Scientific Director and the Division Heads the studies that had been conducted at Kwajalein and attempted to tie this preliminary work into the internal deposition studies being conducted at NRDL. Dr. Tompkins pointed out that the Laboratory could not assume any more work than it had undertaken in support of Project 4.1. The urine and fission product studies and the very complete biological studies on the food products and animals obtained from Rongelap have strained the Laboratory to the limit of its capabilities. They will not be able to do any long-term studies on plant life or fish from the Atoll. It was the opinion of some staff members that the amount of fission products found in the urine at this late date indicated an initial body burden in the natives of several times tolerance and possibly in the lethal range. This was not an unanimous opinion but seemed to be supported by some work which Dr. Paul Tompkins had done in the past.

8. SANDIA BASE.

(a) The undersigned briefly detailed for General Hasbrouck the studies which had been undertaken by Project 4.1 and answered many questions which the General posed regarding the status of this study.

(b) Colonel Peterson discussed his personnel problems at Sandia Base Hospital and then conducted the undersigned on a tour of the new Out-Patient Clinic. Time did not permit a more extensive inspection of the hospital facilities. It was apparent, in common with all hospital facilities, that the new clinic is overcrowded within scant weeks of its opening. The clinic patients are overflowing into the hallways and it is necessary to put out temporary benches to provide seating accommodations.

9. LOS ALAMOS SCIENTIFIC LABORATORY.

(a) Dr. Langham and Dr. Harris reviewed the work which had been done on the urines from the natives and the American personnel at Kwajalein. They found that the strontium, barium, ruthenium, and plutonium, in urine

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of the natives indicates a body burden of these fission products which is somewhat below tolerance. The individual isotopes range from 1% to 40% of tolerance. On the other hand, the total body burden of iodine was 1,650 times the tolerance dose. The American personnel are at least a factor of 10 lower than the natives. By a very ingenious mathematical treatment it is possible to show that the total body burden of any particular isotope is a factor of the same number of bomb fissions. These findings, while at variance with those at the NRDL, appear to me to be based upon somewhat more firm foundations. The Los Alamos Scientific Laboratory is in a somewhat better position to conduct long-term studies upon food products from Rongelap but they are not anxious to do so in light of the very ambitious neutron program which they are now conducting. Dr. Langham has submitted to the Division of Biology and Medicine of the AEC a very complete program which the AEC could profitably carry out in any of its laboratories. This has been titled "Operation Hardy" (the return of the native).

(b) The undersigned discussed the possibility of transferring Major Sam Rothermel from the Laboratory. Dr. Langham stated that he was extremely well pleased with Major Rothermel's contributions to his Section and that he would very much regret losing this officer. Major Rothermel is conducting a series of experiments on mortality from massive doses of neutrons and his work will be a major contribution to our incapacitation problem.

10. Conclusions:

(a) Considering the difficulties which the AFSWP experienced in manning Project 4.1, it might be appropriate for this Headquarters to undertake a study of the methods by which designated personnel with earmarked equipment could be made available upon short notice to conduct a study of this type or of comparable nature wherever required. The fact that this was essentially an all-Navy team vastly simplified administration and automatically provided excellent rapport at the Kwajalein Naval Station. Should it become necessary to establish such a team for comparable studies in areas under the jurisdiction of either of the other services, it would expedite matters were these teams made up of personnel from the appropriate services.

(b) As originally constituted, Project 4.1 was designed to study skin lesions and blood changes of the exposed personnel. After arriving in the Marshalls the responsibility for collecting many types of specimens from the contaminated Atolls devolved to the project personnel. As long as the Project is functioning, these collections can be continued, however, the problem of long-term study of the affected Atolls is one of prime

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consideration and the tenure of Project 4.1 is necessarily limited; among the items which should be studied on a long-term basis are soil, water, food, and fish, from the Atolls, blood, urine, and Beta burns on the natives and internal deposition studies of the natives and their livestock. The High Commissioner of the Trust Territory is particularly concerned about the possibility of returning the natives to their home Atolls and is not in a position to defer their repatriation any longer than is absolutely necessary. These long-term studies do not fall within the province of the AFSWP but it may be well to consider what recommendations are to be made in this regard.

(c) During a period of fall-out upon Kwajalein Island, the undersigned was faced with the problem of furnishing ComNavStaKwaj with a recommendation regarding tolerance levels for stored water supplies as measured by the TLB. A solution to this problem required lengthy calculations using the Effects Handbook and DA Pamphlet 8-11. It was not possible for the untrained medical personnel on Kwajalein to arrive at an appropriate answer with the information available in their handbooks.

11. Recommendations:

(a) It is recommended that:

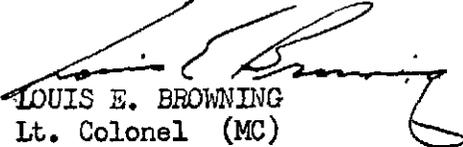
(1) The respective Surgeons General be briefed as to the new developments in this field and that the need for adequately trained personnel be emphasized to them. ✓

(2) That AFSWP consider assuming the responsibility for long-term studies of the blood, urine and Beta burns of the exposed natives. It is recommended that a follow-up survey be conducted in approximately six months and again in one year's time by the personnel of Project 4.1. ✓

(3) That the AEC be informed of the approximate date on which Project 4.1 will be inactivated and that they be requested to assume responsibility for long-term studies on foodstuffs and the environment of the natives in general. ✓

(4) That field manuals be revised to furnish operational personnel with appropriate tables for use with field radiac instruments. ✓

(5) That Major Sam Rothermel remain on duty at the Los Alamos Scientific Laboratory.


LOUIS E. BROWNING
Lt. Colonel (MC)
Surgeon