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ATOMIC BOMB CASUALTY COMMISSION

Supplementary Report

Medical Report on the Fukuryu Maru No. 5 Incident

by

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Submitted: 19 April 1954

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Supplementary Report

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ACKNOWLEDGMENTS

Numerous individuals and agencies of the United States and Japan have contributed their help and encouragement in the preparation of this preliminary report. It is with gratitude we list the various groups and it is with regret that we must gloss over the individuals.

United States Embassy

United States Navy

United States Army

406 General Medical Laboratory

United States Air Force

Atomic Bomb Casualty Commission

Atomic Energy Commission

Japan Ministry of Welfare

Japan Ministry of Foreign Affairs

National Institute of Health (Japan)

Tokyo University

Tokyo University Hospital

North City Hospital, Yaisu

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SUPPLEMENTARY REPORT

Following the initial examination of some of the patients and the contact with Japanese investigators, the Japanese-American scientific rapport deteriorated. This was evidenced by many events as reported by Mr. Eisenbud and the ABCC team. This supplementary report, therefore, will deal with data gleaned from the Japanese, corrections and additions to the preliminary report, and some of the findings on two fish and a ship monitored subsequently.

The blood counts on the crewmembers of the Fukuryu Maru were obtained from the Japanese investigators with the greatest difficulty. Certainly many subsequent blood counts were made, but even though both the Japanese government and the Japanese physicians promised the American team access to these figures, there were no counts made available after 8 April. On this date Drs. Morton and Lewis visited nine patients at the Tokyo University Hospital. All appeared much better as evidenced by skin lesions. After visiting the patients, their white blood counts were reviewed. Striking to the American doctors and obviously missed by the Japanese investigators was a severe granulocytopenia and a slight lymphocytopenia. Regretfully, the figures cannot be reproduced as the American group was not allowed notes, but had to rely on memory for the reproduced counts of 8 April. There certainly appeared to be an inverse relationship between total white blood cell counts and the lymphocyte percentage. The lower the white count, the higher the percentage of lymphocytes, ranging as high as 70%.

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THE SHIP

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In the preliminary report by the ABCC team certain deductions were made concerning the ship. These deductions have since been disproved.

The ship has been reported by the Japanese government to be seven years old. This finding along with other background data on both ship and crew will be forthcoming from the United States Embassy in Tokyo.

As relations between the American team and the Japanese worsened, a policy was set up whereby only by invitation would a ship or its cargo be monitored. On 9 April a request to monitor the Kaifuku Maru No. 5 at Uraga was received. This ship was monitored and that same evening a marlin (sailfish) that was part of the catch was also investigated. This fish was later dissected and shipped to the AEC New York laboratories for analysis. Fish from the Kaifuku Maru No. 5 which were supposedly "hot" were ascertained to be at the National Institute of Health in Tokyo. No invitation was received to monitor these fish.

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~~_____~~
Friday 9 April - 8:30 p.m.
~~_____~~

Ship - KAIFUKU MARU No. 5

	<u>gamma plus beta</u> <u>mr/hr</u>	<u>counts/min</u>
Background	0.03	90
Bow	0.02	60
F'wd cabin	0.03	90
Stbd side f'wd	0.03	90
Stbd side midship	0.02	60
Stbd side aft	0.03	90
Stern	0.03	90
Bow	0.02	60
Port side f'wd	0.02	60
Port side midship	0.03	90
Port side aft	0.02	60
Upper deck port	0.03	90
Upper deck stbd	0.04	120
Fish line on upper deck port side	0.06	180
Line markers atop port side wheel house	0.04	120
Atop wheelhouse	0.04	120

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Friday 9 April - 8:30 p.m.

<u>Fish</u>	<u>mr/hr</u>	<u>counts/min</u>
Pharynx	0.07	210
Left gill	0.07	210
Right gill	0.04	120
Intestine	0.08	240
Skin	0.04	120

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In reviewing the case histories, physical examinations, and laboratory data that are available, there are seen certain differences between the peoples of Hiroshima and Nagasaki, and the unfortunate fishermen. These differences are, for the most part, one of degree; however, there are new signs and symptoms which were present following the 1945 atom bomb explosions.

Pigmentation - this was an uncommon complaint in 1945. The cases in the crewmen seem to have started within 24 hours to 6 days. It was limited seemingly to areas where dust and dirt could come in contact with the skin. These darkened portions desquamated, but information as to time of completion of the peeling is not available. It is assumed that these lesions were due to beta burns, though some quarters have stated radioactive coral might be the cause.

Ulcerations - these were located on areas where dirt and dust would be held in close contact with the skin. They are seen in the ears, which were not washed well; on the hands, where cotton gloves were worn; around the neck, where collars rubbed. The hair, particularly, was prone to catch and hold radioactive particles, washing of the hair did not seem to help and the shaving of the head did not occur for several weeks after returning to Japan.

Itching and vesiculation - these complaints were also limited to the same areas as the burns and ulcerations.

Purpura-like lesions - no petechiae or purpuric areas were seen by the American group. However, there were discrete raised purple lesions on the abdomen, along the belt line (see photographs), ranging in size from a few millimeters up to 2.5 cm. These areas were amongst the first to desquamate and revealed normal pink epidermis.

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Epilation - the earliest case, we recorded, started on the fourth day and ranged to one case starting to epilate on the 20th day. The average day of epilation was the 10th day.

Eye lesions - almost all the crewmen interrogated had some type of complaint referred to the eye or orbit. As the dust collected in the eye or on the lid many complained of tearing, smarting or itching. Within 24 hours a thick sticky yellow discharge was being secreted to such a degree that some of the men could only see by prying the lids apart with their fingers. In some cases this was followed by severe pain.

One has the impression that many of the signs and symptoms of the fishermen as compared to the A-bomb survivors shows a decreased latent period - the complaints occurring earlier in the crewmen. This latter group, to the American team's knowledge, had no hemorrhagic diatheses or oropharyngeal lesions.

These 23 fishermen appear to be of extreme interest to the United States, not only because of their medical lesions, but because of their importance to national defense. As far as it is known these men are the only humans who have been constantly subjected to irradiation for fourteen days. Ordinarily, one would not think of doing such an experiment on animals; yet, due to a freak accident, the experiment occurred to a group of men.

To draw sweeping conclusions from such a small sample would be dangerous. However, the few findings are significant. It is certainly desirable to have all case histories, physical examinations, and laboratory work as complete as possible. With these aims, it is hoped that a more mutual beneficial arrangement can be completed between the American and Japanese investigators.

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COLOR PHOTOGRAPHS

Figures 7A - 16A taken 22 March 1954
Compare with black and white photographs Figures 7 - 16 on same date

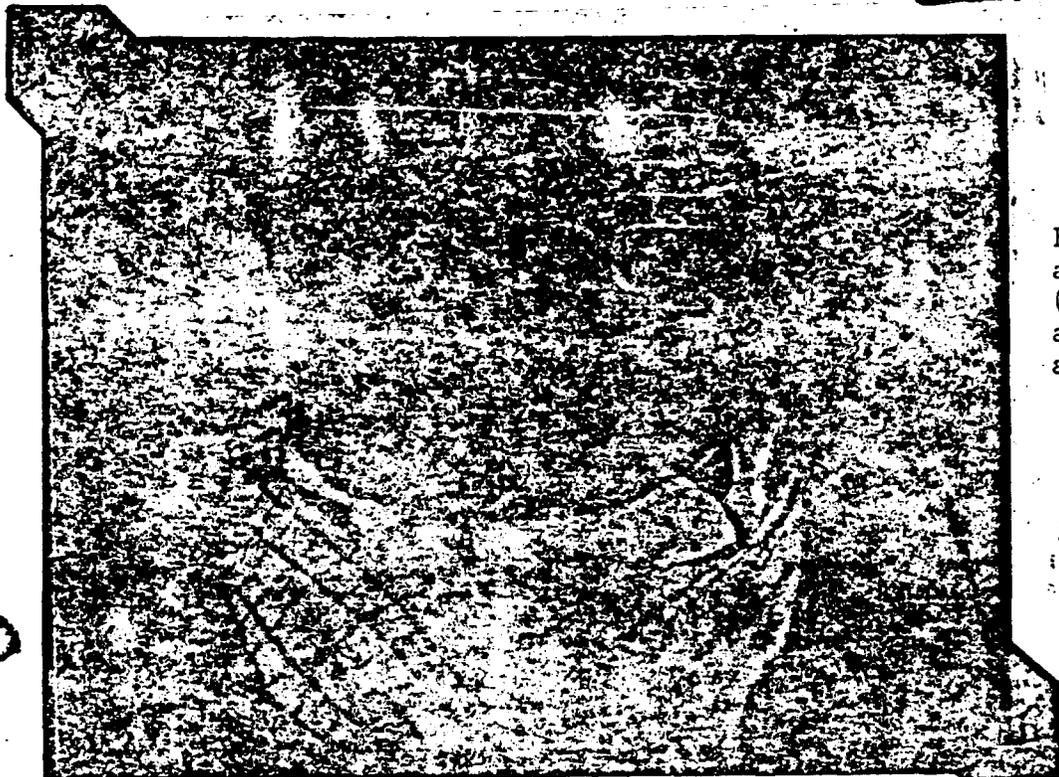
Case T-1

Fig. 7A- Epilation seen in
this photograph and in
Fig. 8A.



Fig. 8A - Desquamation in
areas of deep pigmentati
(cf. Fig. 4). Itchiness
and smarting in collar
area.

T-1



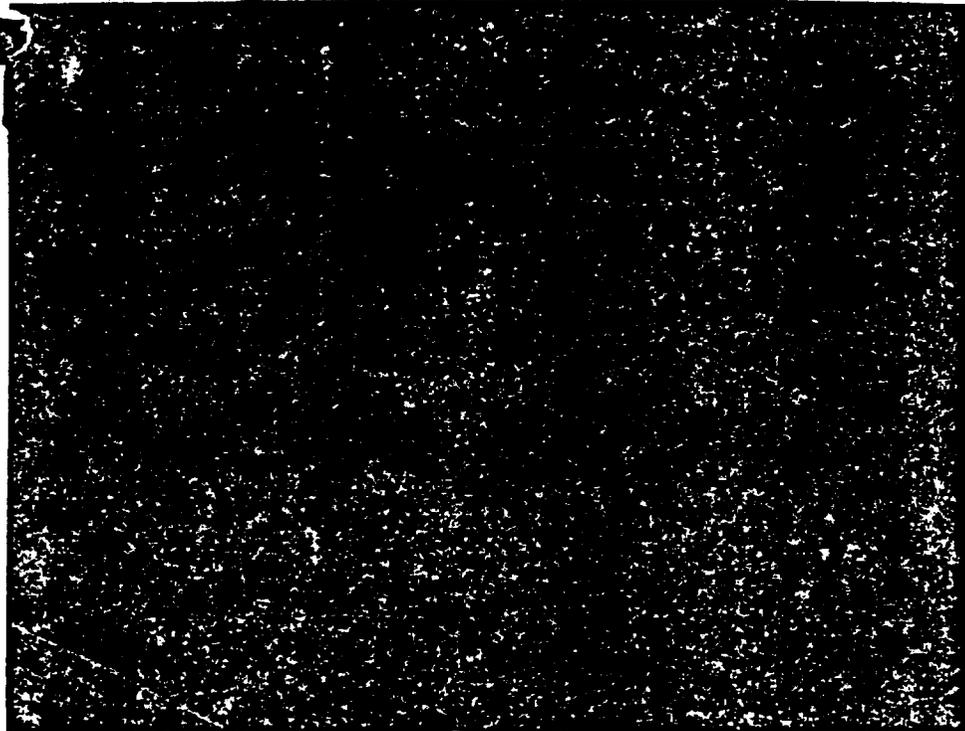


Fig. 9A - Desquamatio
localized epilation
visible.

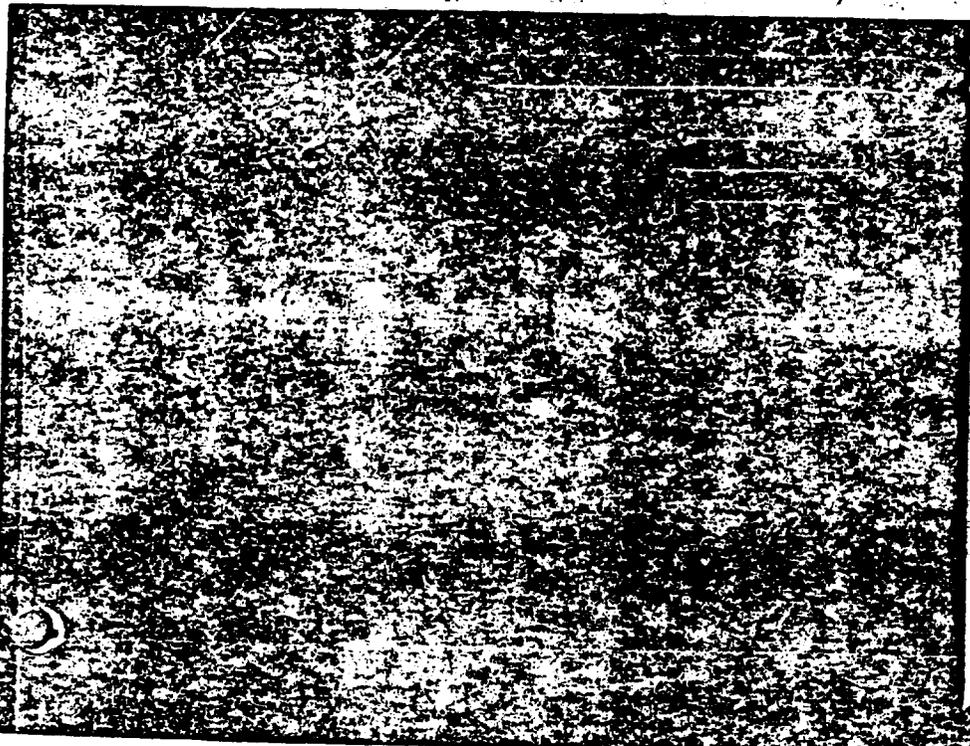


Fig. 10A - Left ear.
vesicles, encrusted
ulcerations visible.

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T-1

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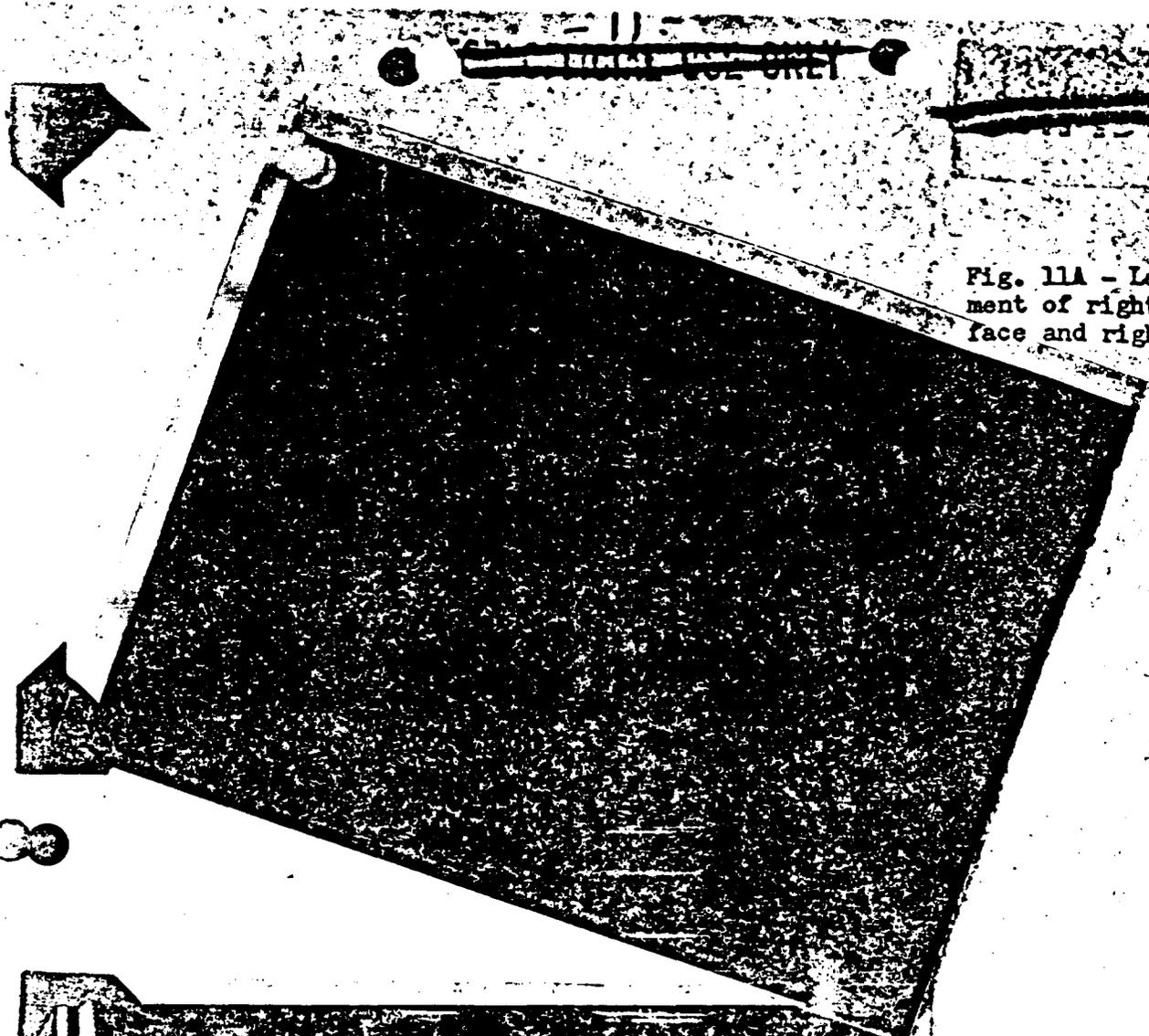
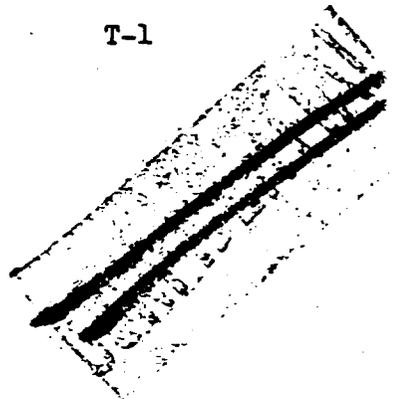


Fig. 11A - Less involvement of right side of face and right ear.



Fig. 12A - Top of head, top of photograph being anterior. Slight ulceration shown, surrounded by boggy swelling of scalp. Mild epilation seen. Patient complains of mild pain in this area,

T-1



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Fig. 13A - Patient still has slight swelling of fingers.

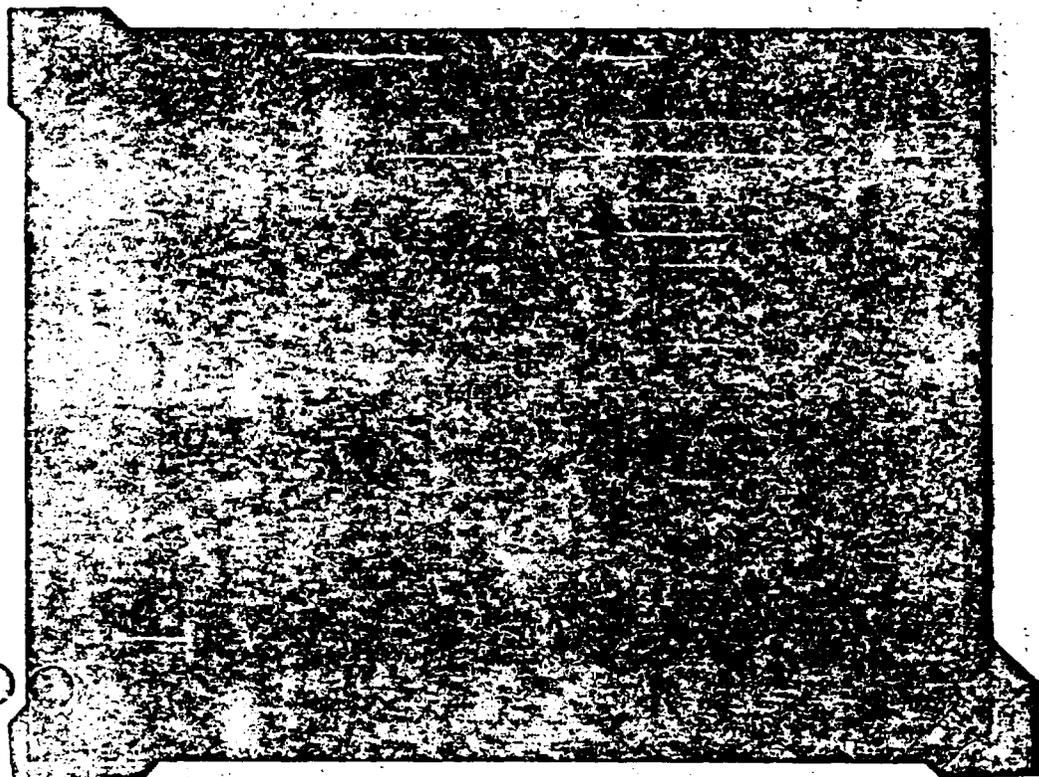


Fig. 14A - Reddening and deepening of furrows at base of left thumb.

T-1

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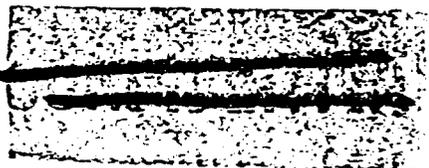
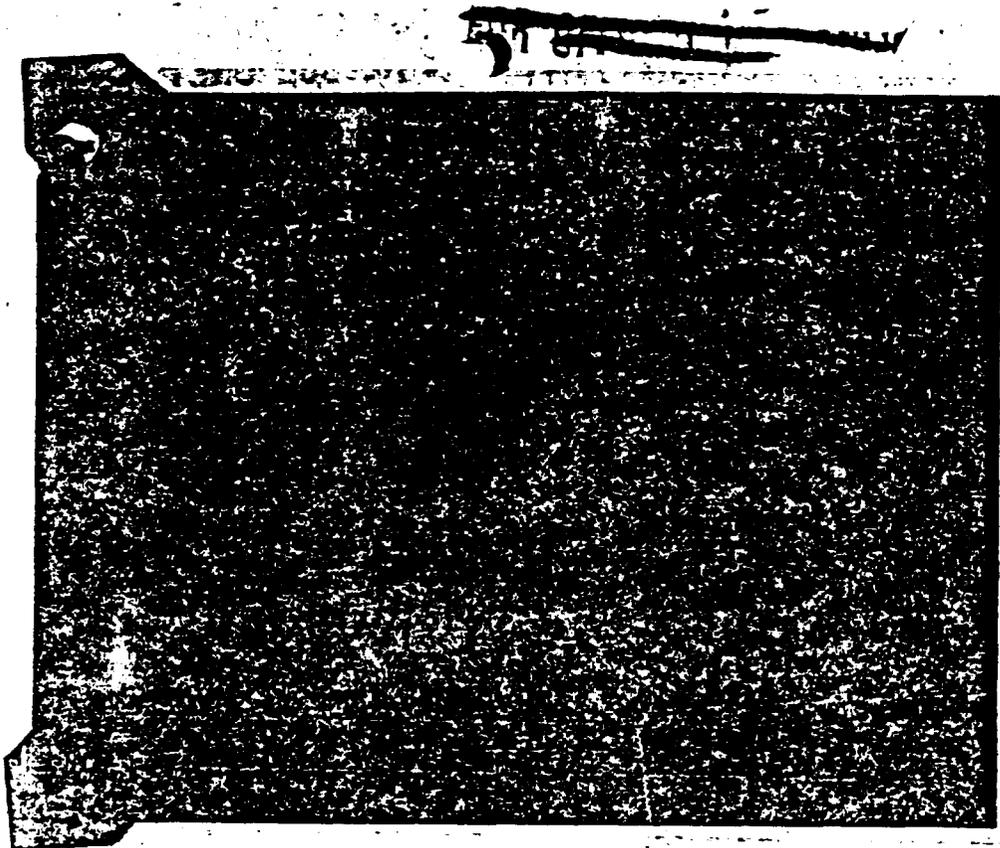


Fig. 15A - Desquamation with small, shallow ulceration at base of thumb.

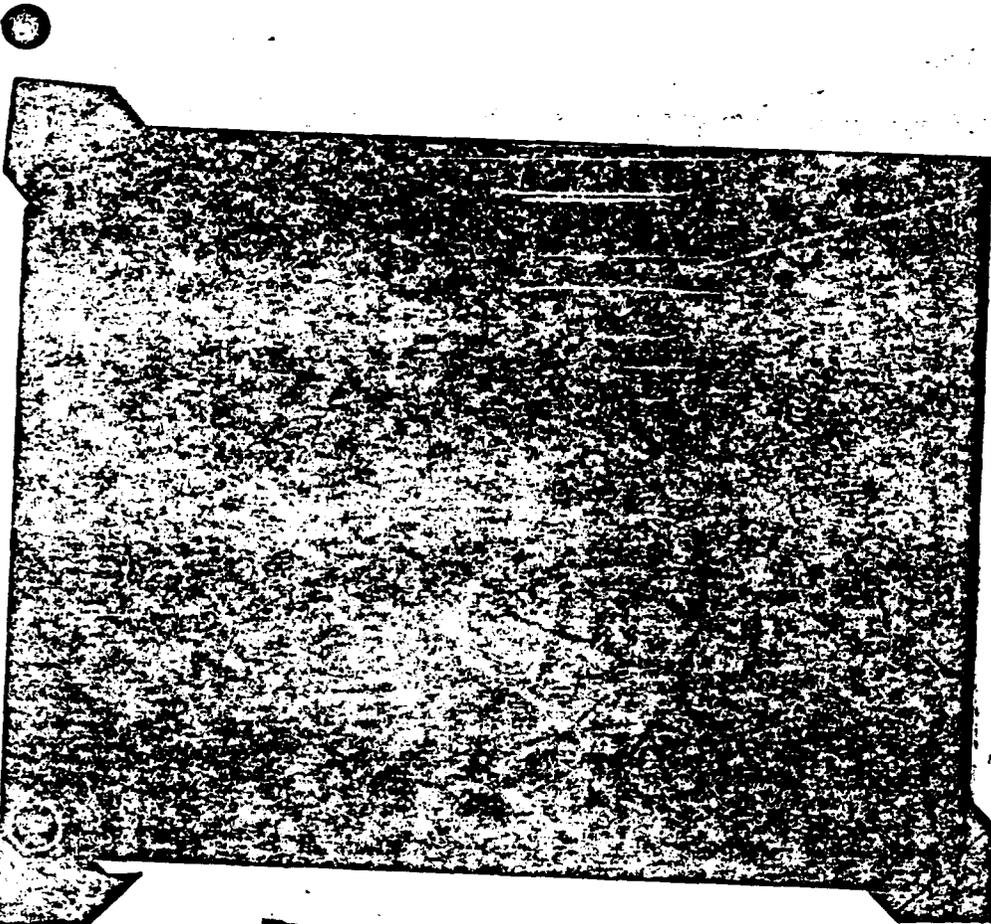
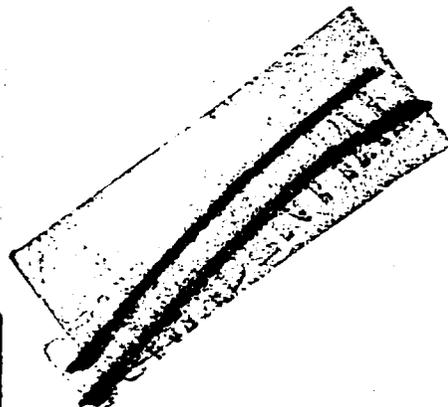


Fig. 16A - Showing pigmented purpura-like lesions at belt area.

T-1.

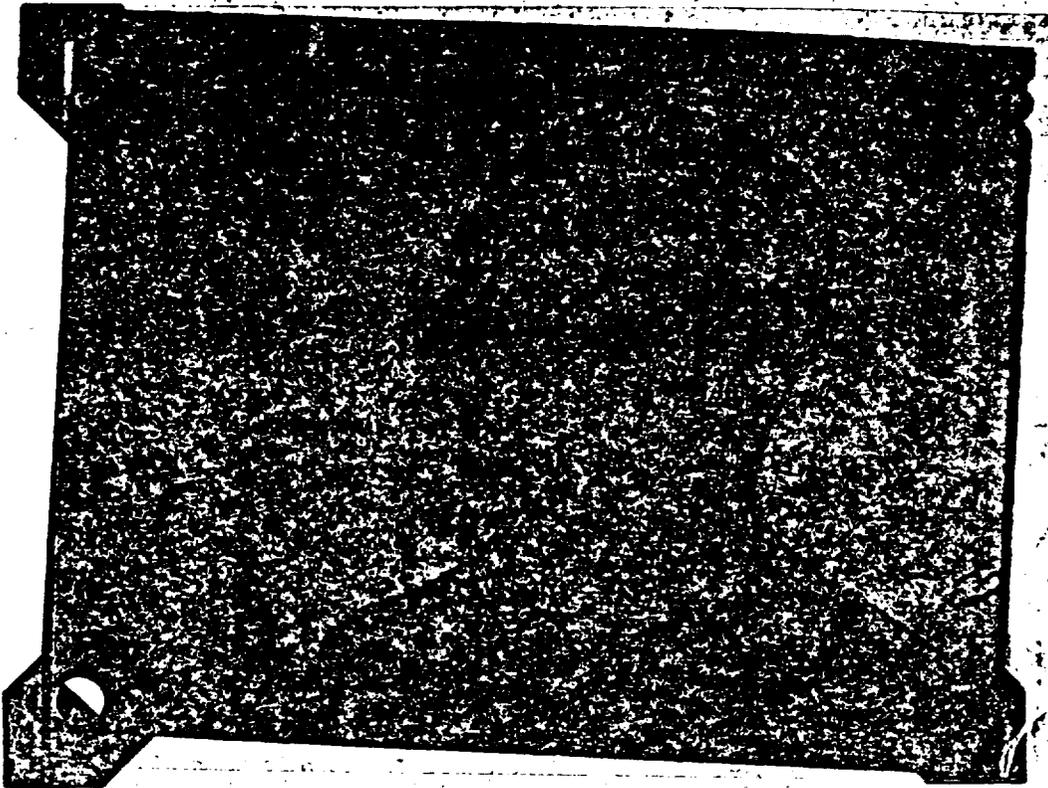


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Figures 25A - 30A were taken on 22 March 1954

Compare with black and white photographs Figures 25 - 30 on same date



Case T-2

Age

Fig. 25A - Deep pigmentation and areas of desquamation on face and neck.

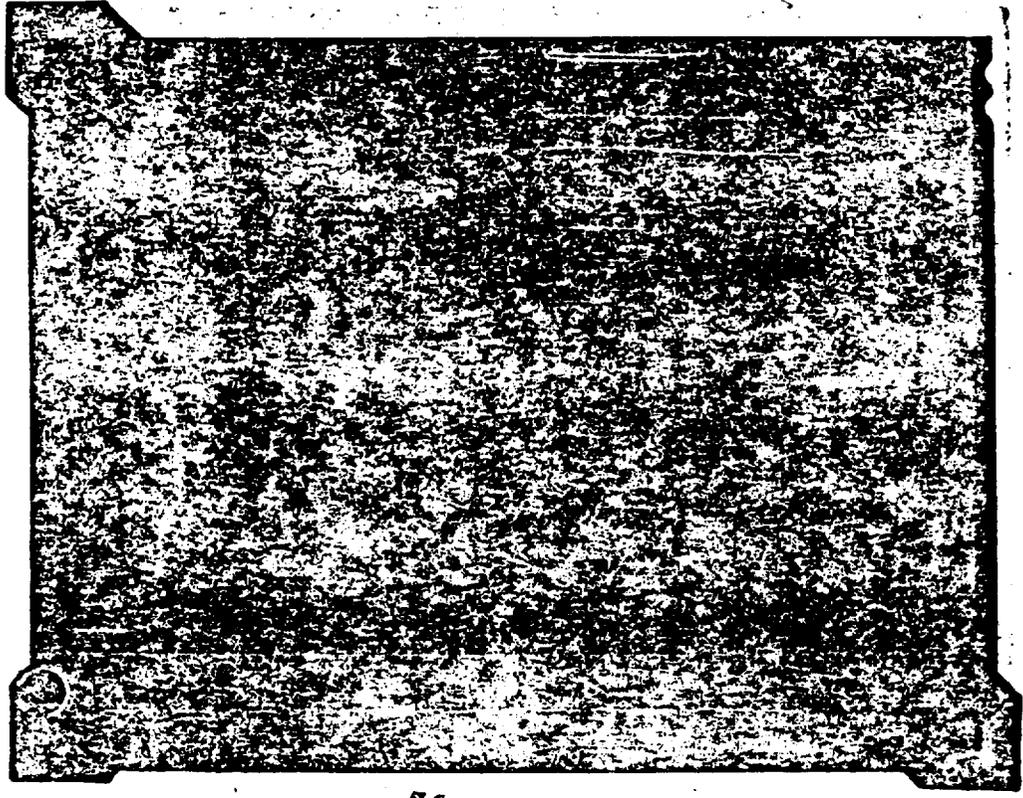
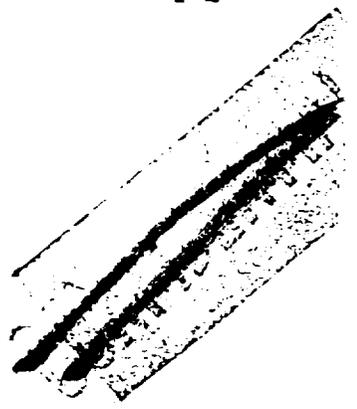


Fig. 26A - Shallow ulcerations of left ear lobe.

T-2



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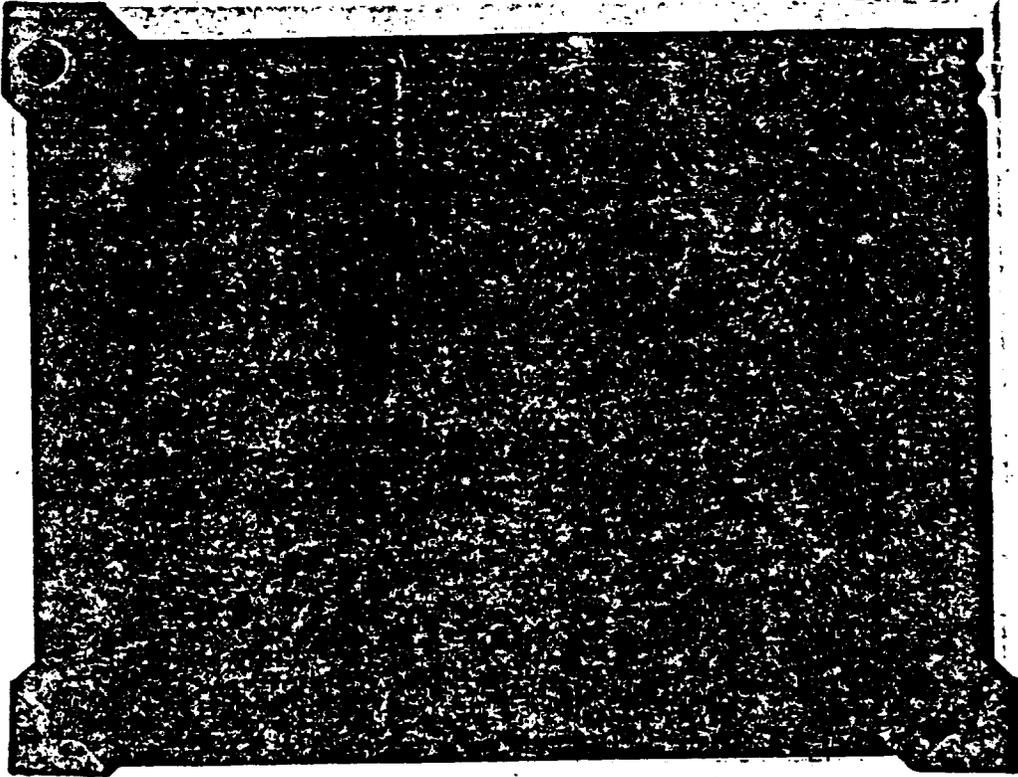


Fig. 27A - Mild epilator and desquamation revealing clear skin.



Fig. 28A - Pigmented, purpura-like lesions, slightly raised. One shows small area of desquamation, revealing pink skin underneath.

T-2.



15

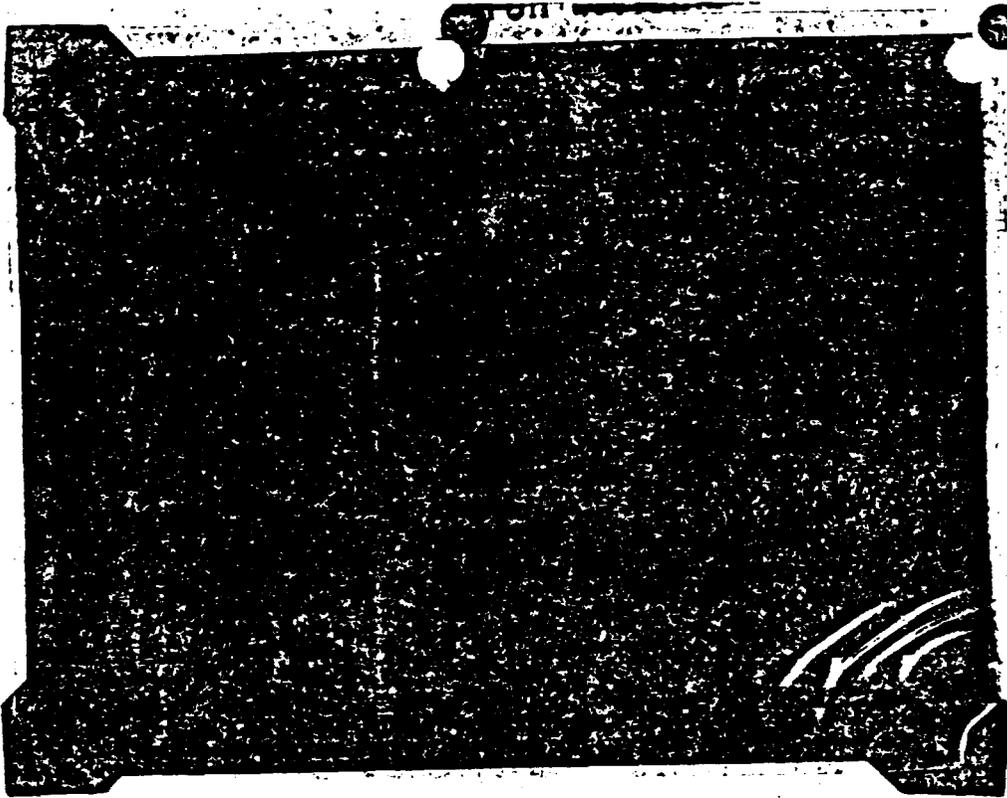


Fig. 29A - Desquamation
in fingers.

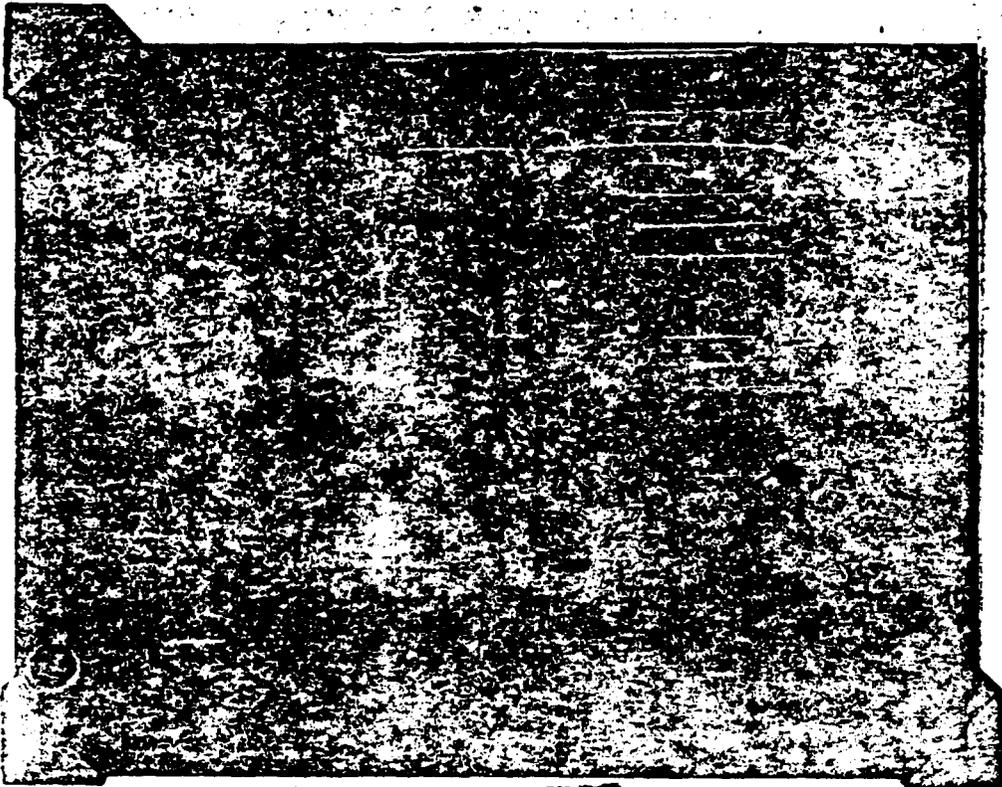
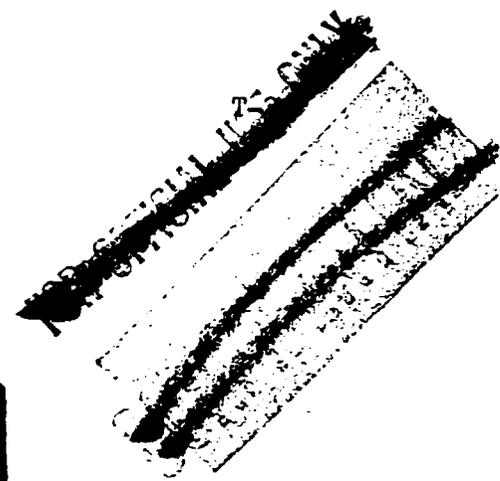


Fig. 30A - Second, third,
and fourth fingers have
developed vesiculation
in volar surfaces. Punc-
tate said to be serous
and sterile. Dead skin
later cut away, revealing
healthy-looking pink skin



WHITE BLOOD CELL COUNTS

14 March 15	16	17	18	19	20	21	22	23		
	4300	2900								
	3600	6300								
9000	6200	6600	6700	4700	3960	5300	4680	4570	4300	4660
5900	6400	7300								
	3100	5100								
5000	6800	7400	4000	4400	5300	5700	4360	2910	4050	3410
	3800	8700								
	6200	7000								
	6800	8000								
5200	5000	9300								
	6200	9000								
5100	5200	6500								
	7200	6900								
	6300	7100								
6700	5800	7200								
	6000	5700								
6600	5600	6800								
6100	6000	9400								



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USDOE ARCHIVES



26 March	27	28	29	30	31	1 April	2	3	4	5	6
	2000	4100	2100	2100	1850	2450	1650	2700	2600		1700
	2100	1500	800	1700	1000	1100	1600	1700	1500		1700
	3000	4300	4500	4800	5300	5200	4600	4500	4100		3300
	4700	7500	5300	4400	3200	5100	2800	3400	5400		1500
	1950	1850	1500	1600	1050	1200	1150	1400	2050		1000
	3200	2700	3200	3800	3800	2400	2800	2700	3800		2100
	3300	4200	3150	3100	3100	2800	3100	3200	2500		3500
		11200			6100	6300	4900	6850	4400		
		7700			5400	5800	5000	5200	4100		
		8050	3400		4800	5300	5400	5000	5000		
		7900			6100	6500	6000	5600	6000		
		8200		5300	5200	5800	5100	4700	4900		
		5300	4050		3800		3700	2800	2950		
		4300		4300	4700	5100	6050	5000	4700		
		4000	3100		3700	2300	1500	1500	2000		
		4800			4400	4600	4200	4900	5700		
		3950	4200		4200	4900	3800	4600	3850		
		5300			4700	5100	4250	4700	3050		



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L. D. C. ARCHIVES

14 March 15

16 17 18 19 20 21 22

23

24 25

4800 8700

7900 6000

5600

7700

7500

4100 5000

Total 55200

117300 162100 10700 9100 9260 11000 9040 7480 8350 8070

Number 9

21 23 2 2 2 2 2 2 2 2

Average 6133

5582 7048 5350 4550 4630 5500 4520 3740 4175 4035

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US DOE ARCHIVES



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26 March	27	28	29	30	31	1 April	2	3	4	5	6	7	8
			5200		8400	6100	4200	3600	3950	4300			
			6850		6950	5800	4100	5800	4800	5000			
			6650			6500	5800	6700	6400	3700			
			5350		4600	4800		4800	4300	4200			
			6300		4300	4750	4100	3600	3700	4000			

Total	20250	127200	35300	55350	100300	90150	92100	93600	89800		14800
Number	7	23	11	13	23	21	23	23	23		
Average	2893	5532	3209	4258	4361	4293	4004	4070	3904		2114

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RADIATION SIGNS AND SYMPTOMS OF ALL PATIENTS

Unit No.	Malaise	Nausea	Diarrhea	Fever	Vomit- ing	Oropharyn- geal lesions	Purpura	Epilation
* T-1								+
* T-2	+	+						+
* T-3		+			+			+
T-4		+						+
T-5	+							+
T-6								
T-7								
T-8								
T-9								+
T-10								
11								
T-12								
T-13								
T-14								
T-15								+
* T-16	+	+						+
T-17								
T-18	+	+						+
* T-19	+	+			+			+
T-20								+
* T-21								+
T-22	+							+
T-23								+

Patients examined by ABCC doctors. ~~FOR SECURITY USE ONLY~~
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RADIATION SIGNS AND SYMPTOMS OF ALL PATIENTS (cont)

Unit No.	Increased Pigmentation	Loss of Appetite	Skin lesions (vesiculations, etc.)	Eye Signs	Purpura-like Lesions
* T-1	+		+	+	+
* T-2	+	+	+	+	+
* T-3	+	+	+	+	
T-4	+		+		+
T-5			+	+	+
T-6					
T-7					
T-8					
T-9			+		
T-10					
T-11					
* T-12					
T-13					
T-14					
T-15			+		
* T-16			+		+
T-17					
T-18	+	+	+	+	+
* T-19	+		+	+	
T-20			+		
* T-21	+		+	+	
T-22	+	+		+	+
T-23			+		+

* Patients examined by ABCX doctors.

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HEMATOLOGY REPORT

On 19 March 1954, patients (T-1) and (T-2) were seen in Tokyo University Hospital and blood counts were performed by Dr. Sears and Miss Tsuchitori, chief hematology technician. Blood smears were made and will be examined after staining at ABCC in Hiroshima. Bone marrow specimens were obtained 16 March 1954 from these two patients by Dr. Miyoshi and one unstained slide of marrow from each patient was given to ABCC. These will be examined after staining in Hiroshima. Dr. Miyoshi also had stained slides of marrow from patients and . These were examined 19 March 1954 by Dr. Sears but conditions were such that only low power lens of microscope could be used. No abnormality of either marrow was observed under these circumstances.

Reports of blood counts on and performed by Yaisu and Tokyo University Hospitals are tabulated below as well as the counts performed by ABCC members.

20 March 1954 - The 21 patients at Yaisu were visited but ABCC staff were not permitted to obtain any blood or bone marrow specimens. Reports of blood counts performed by Yaisu staff are tabulated below.

Blood slides had been made 17 March 1954 on all patients and sent to Tokyo University Hospital. On 22 March 1954 these slides were examined by Dr. Sears and Miss Tsuchitori. Differential count of 100 cells was performed on each specimen as well as a thorough low power

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lens study. In general, these blood smears, while adequate, were not of the quality considered desirable by ABCC. The smears were made on glass slides rather than cover slips and the latter method is considered to give greater accuracy. There was distortion of many white blood cells so that identification was rendered difficult. The stain was lighter than that used by ABCC and recognition of platelets was especially unsatisfactory. However, a general impression of white blood cell distribution and red blood cell and platelet appearance could be obtained and these are tabulated below. There was satisfactory agreement between reported white blood counts and appearance of white cells on slides; i.e., there was an abundance of cells on stained slides whose reported counts were normal or slightly elevated and an apparent paucity of cells on the slide from HISAKI Yoshio (T-16) whose reported white cell count was 2900 on 17 March 1954. The blood slide from

(T-19) had apparently become damaged and only a small portion of the material remained. Red cells and platelets could not be observed satisfactorily. The patient appears to have a definitely abnormal white cell differential count and should have further very careful study.

Bone marrow specimens were obtained 16 or 17 March 1954 by Dr. Miyoshi from four Yaku patients, (T-3), (T-16), (T-19) and (T-21). A stained slide of each marrow was examined 22 March 1954 by Dr. Sears. These smears were also made on glass slides rather than cover slips and demonstrated much cell distortion so that an accurate count was

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impossible to perform. Again only general impressions could be obtained and these are discussed below.

Bone marrow "counts" are reported by the staff at Tokyo University. It has not been our practice to perform total "counts" on bone marrow as their value is considered highly questionable because of the heterogeneous nature of bone marrow specimens.

FOR [REDACTED] [REDACTED]
[REDACTED] [REDACTED] [REDACTED]

