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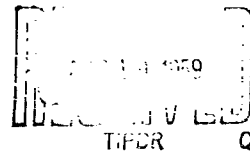
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By
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CNL Technical Memorandum 33-19
Status Report
CNL Tenuersal Program
Phase B - "Pick-Up"

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ABSTRACT

(C) Object.

The object of this phase of the Traversal Program is to estimate the quantity of V-agent that can be picked up on the clothing of troops traversing contaminated areas.

(C) Results.

"Creep and crawl" trials simulating a straight-line traversal of open terrain under fire were conducted at Army Chemical Center, Maryland, on test sites where the moderately dense vegetation (80 to 90% coverage) was maintained at a height of 3 to 6 in. The quantity of simulant picked up on the U.S. Army fatigue uniforms of test subjects crawling across the area within an hour after the dispersion of simulant averaged approximately 1% of the contamination density per unit length of the traversal path (ie, $P' = 0.01 CL$; where P' is the pick-up of simulant, g; C is the contamination density, g/sq m; and L is the distance traversed, m). This relationship appeared to be independent of the particle size of the dispersed simulant, although evidence exists to show that particle size does have some effect on the transferability of simulant and agent.

A comparison of the transferability of agent to that of simulant indicated that the relative transferability of agent decreased with increasing contamination. This relationship may be expressed as $R = \exp(-0.06 C)$, where R is the ratio of agent to simulant picked up on the cloth-covered roller. The constant of this equation is an approximation based on limited data and requires substantiation by further testing.

From the foregoing it was assumed that, if V-agent were used instead of simulant in the "creep and crawl" trials, the average quantity of agent that would have been picked up could be represented by the equation $P = 0.01 CL \exp(-0.06 C)$.

The quantity of agent picked up on the cloth-covered roller traversing contaminated areas one day after the dispersion of V-agent averaged approximately 4% of that picked up when the traversal was effected within one hour after the dispersion. This reflects the apparently rapid decline in agent available for pick-up, a fact which was corroborated in CNL Technical Memorandum 33-19, dated 9 February 1959, covering Phase I (Persistence) of the CNL Traversal Program. (Note: The results presented are specific for a particular field activity and for essentially one type of terrain condition. Additional testing is required to provide information relative to other field activities performed on V's and other types of terrain.)

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Table of Contents

	Page
I. OBJECT.	5
II. AUTHORITY	5
III. INTRODUCTORY REMARKS.	5
IV. EXPERIMENTAL.	6
A. "Creep and Crawl" Trials	6
B. Man-Vs-Roller Trials	8
C. Agent-Vs-Simulant Trials	9
V. DISCUSSION.	10
APPENDICES	
A. Tabulated Data	12
B. Graphs and Charts.	27
C. Photographs.	32

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INTERIM REPORT
CWL TRAVERSAL PROGRAM
PHASE B - "PICK-UP"

I. (C) OBJECT.

The object of this phase of the Traversal Program is to estimate the quantity of V-agent that can be picked up on the clothing of troops traversing contaminated areas.

II. (U) AUTHORITY.

This study was authorized in the Chemical Warfare Laboratories Traversal Program, dated 25 March 1957.

III. (C) INTRODUCTORY REMARKS.

To study and assess the traversal and occupational hazards of dispersed V-agent, the CWL Traversal Program was implemented by direction of the Deputy Commander for Scientific Activities, U.S. Army Chemical Warfare Laboratories. This program is divided into three related phases: Phase A - Persistence and Decontamination - determining the persistence of V-agent and factors governing this persistence; Phase B - "Pick-Up" - determining the quantity of agent transferred to personnel traversing or occupying contaminated areas; and Phase C - Casualty Production - estimating the effectiveness of "pick-up" in producing casualties. These phases are detailed in a CWL document, subject: The Casualty Producing Capability of V-agent when Dispersed as Terrain Contaminant (C), dated 25 March 1957.

This report is concerned primarily with the results of the areal traversal trials conducted under Phase B of the Traversal Program. These trials were designed to provide information relative to the transferability of V-agent to the uniforms of troops crawling across contaminated terrain (ie, simulating the traversal of open areas under fire at night). No tests employing the direct measurement of V-agent pick-up on the clothing of test subjects were considered because of the hazard to participating personnel. Therefore, the objectives of this phase of the program had to be satisfied by estimating the pick-up of V-agent from the results of Field Test No. 1924 and Test Plan No. 29 which were prepared and executed by Test Division. Field Test No. 1924 provided for the conduct of a series of "creep and crawl" trials to determine the quantity of simulant picked up on the uniforms of test subjects crawling across terrain on which simulant was disseminated in specified ranges of contamination densities and particle sizes. Test Plan No. 29 provided for a series of trials to establish (1) the relative transferability of simulant from the ground to both man and a cloth-covered roller, and (2) the relative transferability of agent and simulant from the ground to the roller. The resulting man-to-roller and agent-to-simulant data provided the basis for estimating the quantities of agent that would have been picked up by test subjects had V-agent instead of simulant been used in the "creep and crawl" trials.

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The pick-up due to other activities in the field is yet to be studied. However, as a result of a series of field trials conducted at Army Chemical Center in March 1964, a considerable quantity of such data is available. This information is reported in CRLR 500, subject: Liquid Agent Picked Up by Troops Traversing Areas Contaminated with CW Agents, dated 7 December 1955. It is planned to study the extent to which this large body of information is applicable to the present problem.

All data relative to "pick-up" accumulated since the inception of this phase of the program in July 1957 are incorporated in this report. These results and the inferences drawn therefrom are regarded as interim in character, and as such are issued for temporary or limited use only. They may be superseded when additional data are received and evaluated.

IV. (C) EXPERIMENTAL

A. "Creep and Crawl" Trials

1. Procedure

The "creep and crawl" trials, as prescribed in the test directive for Field Test No. 1024, were conducted on "D" Field, Army Chemical Center, a site selected for the uniformity of vegetation which covered about 80 to 90% of the terrain surface. This area was divided into test strips, one mile by 1/2 mile long. To insure similar terrain conditions for each trial, the grass on these strips was maintained at 1 to 2 in. In each trial, five of six test strips were contaminated with simulant (diisobutyl phthalate dyed with FZ-100, 12 Red) disseminated uniformly by means of a mechanical device. The disseminating apparatus (figure 1, appendix C) was employed for the distribution of small particles, whereas the multi-jet disperser (figure 2, appendix C) was employed for large particles. The uniformity of the contamination and the particle size distribution were determined from sampling cans and 40 paper placed strategically along each test strip. As soon as practicable (15 to 30 min) after the dissemination of simulant, each test strip was traversed by two test subjects*, each crawling as if he were advancing under fire along an assigned path one at a time. For this reversal, the dress consisted of U.S. Army fatigue uniforms over cotton drawers and long-sleeved undershirts; the test subjects also wore cotton gloves and helmet liners, and carried simulated (wooden) rifles. As soon as the forwarder traversal was effected, all clothing was removed, and traces of simulant on the rifles, helmet liners and skin were swabbed with solvent. The clothing and all swabs were forwarded for analysis at the close of the trial. Items of clothing were photographed and sectioned prior to being analyzed for the quantities of simulant picked up on the various parts of the uniform.

*In the last four trials, a cloth-covered roller (figure 4, appendix C), was substituted for the second test subject traversing 3 of the 6 test strips. (cf, par B 1).

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2. Results.

During the period of July 1957 through May 1958, a total of eleven "creep and crawl" trials were conducted. In these trials simulant was disseminated in densities ranging from 0.3 to 13.6 $\mu/\text{sq m}$ with particle size distributions having mass median diameters of about 20 to 3,100 microns. The data derived from these trials, representing a total of 103 individual traversals, are presented in tables 1 through 11, appendix A. Photographs of the representative distributions of simulant on clothing are included as figures 5 through 7, appendix C.

The quantity of simulant picked up on the uniforms of test subjects was found to be directly proportional to the density of the disseminated agent. The average pick-up was equal to 1% of the contamination density per unit length of the traversal path, or as alternately phrased, equal to 0.01 times the contamination density times the distance traversed (viz, for the 50-meter traversal during these "creep and crawl" trials, the average pick-up was numerically equal to one-half the contamination density). This relationship, which appeared to hold equally well over the entire range of densities employed, appeared to be independent of the particle size of the dispersed agent.

In general the simulant on the uniforms was located, in descending order of contamination, on the gloves, lower abdomen, elbows, knees, forearms, upper abdomen, thighs, shins, chest, and upper arms. This distribution of simulant is presented graphically in figures 1 and 2, appendix B, and is summarized in the table below. Variations in pick-up and distribution of the simulant on uniforms were attributed to differences in the manner in which individuals crawled; these could be ascribed to the physical characteristics (ie, height and weight) of the subjects and to the traversal time.

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DISTRIBUTION OF SIMULANT ON CONTAMINATED UNIFORMS

Location	Average Percentage of Total Pick-Up
Jacket	
Chest, left	3.0
Chest, right	1.9
Upper Abdomen, left	6.5
Upper Abdomen, right	3.8
Upper Arm, left	1.3
Upper Arm, right	0.8
Elbow, left	7.6
Elbow, right	5.1
Forearm, left	6.0
Forearm, right	4.4
Trousers	
Lower Abdomen, left	8.1
Lower Abdomen, right	6.4
Thigh, left	5.7
Thigh, right	4.5
Knee, left	6.1
Knee, right	4.7
Lower Leg, left	3.4
Lower Leg, right	2.6
Gloves	
Left	8.0
Right	9.9

In three of the eleven trials, the pick-up deviated significantly from characteristic results. In trials 5 and 7 roughly half the anticipated quantity of simulant was picked up. This reduced pick-up was attributed to the frozen terrain during trial 5, and to the dead and very dry vegetation covering the area during trial 7. In trial 11 the use of a different dye in preparing the simulant was assumed responsible for the pick-up which was apparently twice the anticipated quantity.

B. "Man-Vs-Roller" Trials.

1. Procedure.

In accordance with Test Plan No. 29, as amended, the test site on Graces quarters was divided into 20 adjacent test strips, 2 meters by 25 meters, which were numbered consecutively. To eliminate grass height as a variable in these trials, the grass was mowed to 3 in. on days of test. On the ten

odd-numbered uniform sizes. multiple microns (figure simulant pans used as in the clothes of determinations select data which represent

the relative test subject appendages "crawl"

test subject length of the results (of par

of simulant picked up constant supplement Field.

more trials relation "crawl" of technique during t

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odd-numbered strips simulant (dibutyl phthalate dyed red) was disseminated uniformly in a specified range of densities in both large and small particle sizes. Large droplet sizes (about 3,000 microns) were generated by the multi-jet disperser (figure 2, appendix C); small particle sizes (about 500 microns), by the same device equipped with air-operated spray nozzles (figure 3, appendix C). As soon as practicable after the dissemination of simulant (ie, about 15 min, the time to collect the contents of sampling pans used to check the uniformity of dispersion), each test strip was traversed as in the "creep and crawl" trials described in par A, 1, above, however, with the cloth-covered roller substituting for the second test subject. The quantities of simulant picked up on both clothing and cloth of the roller were determined. (Note: One test subject was employed throughout these trials. His selection for these trials was based on a cursory review of "creep and crawl" data which indicated that his manner of crawling resulted in pick-up most representative of the average of all test subjects.)

2. Results.

The results of these ten trials conducted in June 1958 to establish the relative transferability of simulant from terrain to the uniform of a crawling test subject and to the cloth-covered roller are presented in tables 12 and 13, appendix A. These tables also include supplementary data derived from "creep and crawl" trials (see footnote b b).

The average quantity of simulant picked up on the uniform of the test subject was somewhat in excess of 1% of the contamination density per unit length of the traversal path. This pick-up was not significantly different from the results derived from "creep and crawl" trials conducted on "M" Field (cf par A, 2, above).

A good correlation was obtained between the comparative quantities of simulant picked up by man and the cloth-covered roller; ie, ratio of simulant picked up by the roller to that picked up by man appeared to be essentially constant and independent of particle size. The same relationship was found in the supplementary trials conducted in conjunction with "creep and crawl" tests on "M" Field.

Figure 3, appendix B, indicates that smaller particles are somewhat more transferable from the terrain to cloth than are the larger particles. This relationship between particle size and pick-up was not detectable from "creep and crawl" data because of the overshadowing effects of minor differences in crawling techniques of individual test subjects, and differences in terrain characteristics during the 10-mo test period.

C. "Agent-Vs-Simulant" Trials.

1. Procedure.

As prescribed in Test Plan No. 29, the trials described in par B, 1, above, were rerun on the even-numbered test strips with VX substituted for

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simulant and with the traversal of the strips by test subjects eliminated. As soon as practicable after the dispersion of toxic agent, the roller, covered with two layers of cotton sateen cloth, was rolled along the left side of the strip. In a like manner, the right side of the strip was traversed by the roller on the following day. In both cases, as soon as the traversal was effected, each layer of cloth was removed from the roller and analyzed for agent picked-up. The procedure of analysis used was the DB3 method.

2. Results.

The results of 10 trials conducted in July and August 1958 to determine the quantity of V-agent picked up from contaminated terrain by the cloth-covered roller are included as table 14, appendix A.

When the quantity of agent picked up on the roller traversing the test strip within an hour after contamination was compared with the quantity of simulant picked up under similar conditions in trials described in par B, above, it was found that the relative transferability of agent decreased with increasing contamination. This relationship is graphically depicted in figure 4, appendix B, where the ratio of agent to simulant pick-up is plotted against contamination density on semi-logarithmic paper to produce a straight line whose equation is $R = \exp(-0.06 C)$; where R is the ratio of agent to simulant pick-up; and C, the contamination density in g/sq m. This line was based on limited data, and the equation, therefore, requires substantiation by further testing.

As was the case with simulant, agent disseminated in smaller particles was picked up somewhat more efficiently by the roller on the first traversal than was agent disseminated in the larger droplets. Whereas the pick-up of simulant was found to be directly proportional to the contamination density (within test limits), the pick-up of agent leveled off or became less efficient with increasing ground contamination.

The penetration of agent from the top layer of cloth to the under layer was not significant during the first traversal, amounting to an average of about 2%. However, on the second traversals of trials 6 through 10 performed on wet terrain, the increased percentage of agent on the undercloth indicated the aid to penetration provided by moisture.

The quantity of agent picked up on the roller traversing the contaminated area one day after the dispersion of V-agent was found to average approximately 4% of that picked up on a roller traversing the area within an hour after contamination is effected. This indicates the rapid decline in agent available for transfer to troops traversing the area.

V. (C) DISCUSSION.

The over-all objective of the Traversal Program is the estimation of the casualty producing capabilities of V-agent dispersed as a ground contaminant. The performance of the trials covered in this report provided agent pick-up data which, when coupled with information relative to the percutaneous toxicity of the agent and its penetration through treated and untreated fabrics, permit an estimation of

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APPENDIX A

TABULATED DATA

	Page
Table 1 "Creep and Crawl" Trial No. 1.	13
Table 2 "Creep and Crawl" Trial No. 2.	14
Table 3 "Creep and Crawl" Trial No. 3.	15
Table 4 "Creep and Crawl" Trial No. 4.	16
Table 5 "Creep and Crawl" Trial No. 5.	17
Table 6 "Creep and Crawl" Trial No. 6.	18
Table 7 "Creep and Crawl" Trial No. 7.	19
Table 8 "Creep and Crawl" Trial No. 8.	20
Table 9 "Creep and Crawl" Trial No. 9.	21
Table 10 "Creep and Crawl" Trial No. 10.	22
Table 11 "Creep and Crawl" Trial No. 11.	23
Table 12 Pick-Up on Man in Man-vs-Roller Trials.	24
Table 13 Comparative Pick-Up on Roller and Man.	25
Table 14 Comparative Transferability of Agent and Simulant.	26

CONFIDENTIAL

Date: 15 July 1957

TABLE 1
ONEP AND CRACK TOTAL NO. 1

Task Subject	A	B	C	D	E	F	G	H	I	J
Height (in.)	71	59	75	67	70	71	67	69	65	69
Weight (lb.)	165	135	145	145	145	210	135	135	150	155
Uniform No.	00338	00330	00335	00335	00335	00335	00335	00335	00335	00335
Contamination density (g./sq. m.)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Particle size (μm)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Interval time (min. - sec.)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Location of Picked-up	Simulant Picked up (eq.) on Various Sections of Uniform									
Head										
Chest, left	3	1	2	10	2	2	7	0	2	6
Chest, right	4	3	3	7	0	0	5	0	3	6
Upper abdomen, left	7	15	5	9	4	6	8	17	3	6
Upper abdomen, right	10	4	5	7	2	3	8	14	0	6
Upper arm, left	0	0	0	0	0	0	0	0	0	0
Upper arm, right	0	0	0	0	0	0	0	0	0	0
Elbow, left	6	6	7	7	6	5	10	11	15	9
Elbow, right	3	5	5	4	1	1	7	3	2	3
Forearm, left	7	7	12	4	1	1	11	8	5	13
Forearm, right	2	6	9	5	2	1	7	4	7	9
Trunk										
Lower abdomen, left	11	8	16	6	12	2	9	17	2	6
Lower abdomen, right	12	1	9	11	12	7	15	14	11	10
Thigh, left	9	4	16	5	9	10	13	15	6	7
Thigh, right	6	7	13	5	7	7	8	13	8	1
Knee, left	6	7	13	1	7	7	7	8	8	6
Knee, right	6	7	13	6	7	6	7	8	8	6
Lower leg, left	0	1	1	6	0	5	0	5	3	0
Lower leg, right	0	2	0	6	0	0	1	5	1	0
Slaves										
Left	16	13	2	15	11	11	26	13	13	12
Right	16	15	6	11	8	13	26	13	11	16
Miscellaneous										
Rifle	3.2	3.4	0.5	2.3	2.4	0.4	1.8	2.9	1.1	0.9
Knife	0.7									
Gloves	0.6									
TOTAL	127	116	124	130	90	100	195	186	108	189
Pick-up Factor**	0.770	0.703	0.719	0.754	0.554	0.615	1.214	1.220	0.732	0.875

*Total quantity of simulant picked up on jacket, trousers, and gloves.
**Pick-up factor equals percent of the ground contamination picked up on the uniform per meter of traversal.

Remarks:

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1

TABLE 1
CREEP AND GRAB TABLE NO. 1

Date: 15 July 1957

Test Subject	A	B	C	D	E	F	G	H	I	J
Height (in.)	71	69	75	67	70	71	67	69	65	69
Weight (lb.)	165	155	175	145	190	240	175	175	155	155
Uniform No.	0330	0330	0335	0315	0335	0385	0335	0305	0335	0335
Contamination weight (g./sq. cm.)	560	560	505	530	535	555	535	535	535	535
Particle size (μ)	5-50	5-50	5-50	5-50	5-50	5-50	5-50	5-50	5-50	5-50
Location of Pick-up	Simulant Picked up (No. of Particles Settling on Uniform)									
Head										
Chest, left	3	1	2	12	2	2	7	0	2	6
Chest, right	4	2	3	9	0	6	5	0	0	6
Upper abdomen, left	7	1	3	7	0	3	8	0	0	6
Upper abdomen, right	10	0	0	0	0	0	0	0	0	0
Upper arm, left	0	0	0	0	0	0	0	0	0	0
Upper arm, right	0	0	0	0	0	0	0	0	0	0
Elbow, left	0	0	0	0	0	0	0	0	0	0
Elbow, right	0	0	0	0	0	0	0	0	0	0
Forearm, left	2	7	5	1	1	1	1	0	2	1
Forearm, right	2	6	9	5	2	1	7	0	3	9
Trunk										
Lower abdomen, left	11	2	16	6	12	2	9	17	0	6
Lower abdomen, right	17	1	9	11	12	7	15	17	0	20
Thigh, left	9	0	12	5	12	10	13	16	0	1
Thigh, right	9	0	10	5	12	7	13	16	0	1
Knee, left	6	0	3	6	3	7	7	8	0	0
Knee, right	6	0	3	6	3	7	7	8	0	0
Lower leg, left	0	0	0	0	0	0	0	0	0	0
Lower leg, right	0	0	0	0	0	0	0	0	0	0
Arms										
Left	16	13	2	15	11	11	26	13	12	12
Right	16	15	6	11	8	13	28	12	11	16
Extremities										
Head	3.2	3.4	0.5	0.3	2.4	0.0	1.3	2.9	1.1	0.9
Neck	0.7	0.6	0.5	0.8	1.8	0.4	3.8	2.9	0.5	1.0
Upper arm, left	0.6	0.6	0.5	0.8	1.8	1.4	3.4	2.9	0.5	1.0
Upper arm, right	0.6	0.6	0.5	0.8	1.8	1.4	3.4	2.9	0.5	1.0
TOTAL	127	116	124	130	90	150	185	186	106	189
Pick-up factor	0.775	0.703	0.710	0.754	0.554	0.615	1.214	1.220	0.732	0.875

Remarks:

*Total quantity of simulant picked up on jacket, trousers, and gloves.

**Pick-up factor equals percent of the ground contamination picked up on the uniform per meter of traversal.

2

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TABLE 2
GRAVE AND GRAVE DATA, NO. 2

15 July 1957

Test 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14 July 1957

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TABLE 2

CPSC AND ORNL TEST NO. 2

18 July 1967

Test Subject	H	I	C	S	F	B	U	U	F	A
Height (in.)	69	65	75	70	71	69	67	67	67	71
Weight (lb.)	175	150	195	180	210	155	165	135	135	185
Uniform No.	69	65	43	68	66	45	70	6	6	11
Contamination Density (g./sq.in.)	2.33	9.33	11.5	11.5	11.4	11.4	9.76	9.76	12.2	12.2
Particle Size (μ, MMD)	265	365	385	395	365	385	385	385	380	390
Inhalation Flow (min. - sec.)	6-12	7-19	5-19	5-26	3-9	3-11	3-23	2-13	3-10	5-10

Simulant Picked up (μg.) on Various Sections of Uniform

Location of Pick-up	1	2	3	4	5	6	7	8	9	10
Neck										
Chest, left	36	85	326	261	236	219	376	185	335	296
Chest, right	21	115	173	174	119	107	119	273	214	396
Upper Abdomen, left	52	231	218	174	150	150	184	215	514	505
Upper Abdomen, right	24	160	711	397	180	180	180	284	517	288
Upper Arm, left	50	62	61	220	180	180	180	180	180	314
Upper Arm, right	9	43	55	37	81	81	81	60	132	179
Elbow, left	232	219	291	352	126	126	126	163	425	415
Elbow, right	65	110	110	180	270	270	270	111	303	277
Forearm, left	209	195	329	623	235	235	383	213	187	277
Forearm, right	207	159	213	253	91	91	353	136	189	193
From arms										
Lower Abdomen, left	116	732	117	726	219	219	376	185	746	382
Lower Abdomen, right	151	732	636	567	298	298	388	475	605	156
Thigh, left	88	217	260	442	84	84	134	136	393	61
Thigh, right	82	217	234	233	130	130	118	136	278	282
Knee, left	82	217	217	188	35	35	306	101	343	139
Knee, right	82	217	156	164	86	86	259	131	229	136
Lower Leg, left	111	161	154	795	149	149	189	189	189	119
Lower Leg, right	90	161	154	795	149	149	189	189	189	119
Glases										
Left	315	15	110	360	506	506	762	600	862	586
Right	176	217	110	730	580	580	366	856	354	1044
Miscellaneous										
Rifle	25	37	24	34	40	40	40	76	54	92
Underwear										
Cuff, left	0.8	11.4	76.0	0.8	5.0	5.0	5.0	3.6	2.0	1.9
Cuff, right	51.6	1.1	129.0	cal	cal	cal	cal	52.6	cal	13.6
Shin										
Left	0.1	1.4	2.4	4.2	0.5	0.5	7.7	2.7	5.1	0.6
TOXILE										
TOXILE	1.74	233	5050	7331	3844	3844	6244	1551	5248	7450
Pick-up Packages										
Pick-up Package	1.035	0.439	0.879	1.031	0.673	0.673	1.274	0.936	1.359	1.222

1. Total quantity of simulant picked up on jacket, trousers, and gloves.
 2. Pick-up factor equals percent of the total contamination picked up on the uniform per action of Universal.

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TABLE 3

PROB. AND ORNL TOTAL NO. 3

18 July 1957

Test Subject	A	B	C	D	E	F	G	H	I	J
Age (yrs.)	69	65	75	70	69	71	67	71	67	69
Height (in.)	175	150	175	180	155	210	165	165	135	135
Weight (lb.)	69	55	143	68	44	66	70	44	17	17
Waistline No.	933	933	115	115	115	115	9.76	12.2	12.2	12.2
Contamination Density (g./sq.in.)	365	365	365	365	365	365	365	365	365	365
Particle Size (μ, std)	7-13	7-13	5-19	5-26	3-11	3-9	3-23	3-40	3-40	3-40
Average Size (μ, std)	6-12	6-12	5-19	5-26	3-11	3-9	3-23	3-40	3-40	3-40

Simulant Picked H (mg.) on Various Locations of Uniform

Location of Pick-up	A	B	C	D	E	F	G	H	I	J
Neck										
Chest, left	213	36	85	170	214	726	376	105	188	296
Chest, right	75	24	115	213	217	567	298	605	291	396
Upper Abdomen, left	146	52	175	213	217	567	298	605	291	396
Upper Abdomen, right	280	34	170	213	217	567	298	605	291	396
Upper Arm, left	275	50	170	213	217	567	298	605	291	396
Upper Arm, right	280	50	170	213	217	567	298	605	291	396
Elbow, left	146	52	175	213	217	567	298	605	291	396
Elbow, right	280	50	170	213	217	567	298	605	291	396
Forearm, left	275	50	170	213	217	567	298	605	291	396
Forearm, right	151	207	157	213	217	567	298	605	291	396
Trouser										
Lower Abdomen, left	113	116	117	117	117	726	376	105	188	296
Lower Abdomen, right	179	154	175	213	217	567	298	605	291	396
Thigh, left	300	154	217	213	217	567	298	605	291	396
Thigh, right	113	84	217	213	217	567	298	605	291	396
Knee, left	113	77	217	213	217	567	298	605	291	396
Knee, right	69	54	175	213	217	567	298	605	291	396
Lower Leg, left	219	114	175	213	217	567	298	605	291	396
Lower Leg, right	111	84	175	213	217	567	298	605	291	396
Glasses										
Left	315	306	75	117	117	365	75	867	600	576
Right	255	247	717	117	117	730	75	867	600	576
Miscellaneous										
Rifle	25	37	37	24	24	34	16	54	76	92
Underwear										
Cuff, left	0.8	73	11.4	26.0	0.8	0.8	5.40	2.0	3.6	1.2
Cuff, right	51.6	73	1.1	129.0	6.4	6.4	52.6	2.0	3.6	1.2
Shin										
Left	0.1	1.1	1.1	7.1	0.5	1.2	7.7	5.1	2.7	0.6
Right	1.71	233	5199	545	3844	7331	6211	8218	1551	7150
TOTALS	1.05	0.99	0.977	0.977	0.672	1.291	1.270	1.359	0.936	1.222
Pick-up Factors										
Neck										

Total quantity of simulant picked up on face, torso, trousers, and glasses.

Pick-up factor equals percent of the dry contamination picked up on the uniform per unit of uniform.

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TABLE 2

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*Total quantity of smelter picked up on jacket, trousers, and gloves.
**Pick-up factor equals percent of the ground contamination picked up on the uniform per meter of travel.

TABLE 1

PICK-UP AND CRAWL TRAIL NO. 1

22 October 1957

Test Subject	A	B	C	D	E	F	G	H	I	J
Height (in.)	69	69	75	69	67	71	70	69	60	71
Weight (lb.)	175	185	195	155	165	210	190	220	160	145
Uniform No.	84	82	21	24	27	51	85	83	25	28
Contamination Density (cc/sq. ft.)	2.67	2.67	0.91	0.91	1.22	1.28	1.06	1.07	2.00	2.00
Particle Size (μ, 40%)	595	595	605	605	590	590	660	660	770	770
Traversal Time (sec.)	7-0	2-10	1-25	3-35	2-20	2-45	2-20	2-15	2-30	2-20
Location of Pick-Up										
Simulant Picked Up (cc.) on Various Sections of Uniform										
Location										
Head, left	55	114	16	21	13	21	13	35	15	21
Head, right	25	65	17	24	22	27	71	11	11	17
Upper Arm, left	181	115	11	21	19	19	71	150	15	37
Upper Arm, right	70	75	13	19	13	25	4	90	36	26
Lower Arm, left	0	0	0	0	6	0	0	0	5	0
Lower Arm, right	0	0	0	0	0	0	0	0	0	0
Back, left	139	74	15	25	46	19	47	74	12	19
Back, right	22	125	23	7	11	25	63	64	33	27
Front, left	49	170	29	17	37	30	136	114	26	61
Front, right	30	51	12	12	15	19	62	36	37	37
Legs										
Upper Leg, left	104	106	19	28	45	20	155	129	72	62
Upper Leg, right	113	128	33	25	17	17	194	69	62	46
Thigh, left	94	65	7	21	29	15	94	56	79	34
Thigh, right	31	49	29	11	12	27	47	47	11	52
Shin, left	172	69	21	25	52	11	117	111	77	73
Shin, right	96	34	12	13	15	34	66	96	65	55
Lower Leg, left	59	47	16	15	17	15	59	12	37	19
Lower Leg, right	24	58	12	13	15	12	32	45	32	11
Feet										
Left	77	101	12	25	22	24	57	71	133	28
Right	77	62	33	11	14	15	45	85	75	75
Remarks										
Profile	2	4	1	1	2	3	4	2	2	2
Factor										
Left	1.5	5.3	2.7	0.7	1.5	0.4	4.1	1.6	2.4	1.8
Right	2.2	2.0	2.7	0.4	0.6	1.9	1.1	2.1	2.3	3.1
Factor*	1177	1712	394	368	493	432	1342	1102	1045	844
Pick-Up Factor**	1.106	1.252	0.438	0.283	0.770	0.675	0.878	0.917	1.035	0.832

REMARKS:

*Total quantity of simulant picked up on jacket, trousers, and gloves.

**Pick-up factor equals percent of the ground contamination picked up on the uniform per meter of traversal.

2

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TABLE 5

CREEP AND CRAWL TRIAL NO. 5

10 February 1953

Simulant Picked up (%.) on Various Sections of Uniform									
Test Subject	H	U	C	H	H	I	J	K	L
Height (in.)	69	67	75	67	67	69	72	70	70
Weight (lb.)	155	125	125	135	135	200	170	200	200
Uniform No.	8	7	6	57	63	63	87	88	88
Contamination Density (g./sq. in.)	5.66	6.77	6.29	6.59	6.59	6.59	7.09	7.09	7.09
Particle Size (in. μ)	1550	1000	1000	1000	1000	1000	1000	1000	1000
Transfer Rate (mln. - sec.)	3-12	3-12	3-30	3-30	3-30	3-40	3-33	3-33	3-33
Location of Pick-up									
Jacket									
Chest, left	8	5	39	4	5	91	9	15	15
Chest, right	9	31	31	3	6	13	6	6	6
Upper Abdomen, left	14	105	105	24	11	206	36	31	31
Upper Abdomen, right	23	175	175	2	12	101	12	12	12
Upper Arm, left	8	6	6	5	1	32	10	10	10
Upper Arm, right	15	55	55	13	4	9	6	4	4
Lower Arm, left	27	205	205	107	70	302	100	92	92
Lower Arm, right	26	149	149	105	79	27	51	97	97
Forearm, left	15	55	55	77	95	129	61	70	70
Forearm, right	55	106	106	94	179	54	19	109	109
Trousers									
Lower Abdomen, left	100	119	110	121	98	380	226	185	185
Lower Abdomen, right	93	100	110	110	133	79	56	81	81
Thigh, left	12	137	58	112	107	109	132	116	116
Thigh, right	18	117	67	61	38	117	51	130	130
Knee, left	27	86	90	67	101	278	79	87	87
Knee, right	11	25	15	86	118	103	66	69	69
Lower Leg, left	11	27	15	95	22	56	55	88	88
Lower Leg, right	11	27	15	95	22	31	23	29	29
Gloves									
Left	64	13	123	137	61	162	64	60	60
Right	67	89	106	149	92	135	89	57	57
Miscellaneous									
Rifle	6	3	7	5	4	10	3	6	6
Underwear									
Cuff, left					1	2	1	1	1
Cuff, right					10	1	8	1	1
Elbow					126	85	7		
Skin			0.4		0.1	0.3		0.4	
TOTAL	719	882	1582	1523	1202	2700	1175	1350	1350
Pick-up Factor**	0.254	0.311	0.503	0.164	0.384	0.616	0.331	0.393	0.393
REMARKS:									

NOTE: Trial performed on frozen terrain at ground temperature 6°F.

*Total quantity of simulant picked up on jacket, trousers, and gloves.

**Pick-up factor equals percent of the ground contamination picked up on the uniform per meter of traversal.

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TABLE 5

CREEP AND CRAWL TRIAL NO. 5

10 February 1958

Test Subject	B	M	C	C	N	K	O	E
Height (in.)	69	72	67	75	67	69	72	70
Weight (lb.)	155	200	135	135	135	200	190	180
Uniform No.	8	77	7	57	78	63	87	86
Contamination Density (g./sq. in.)	5.66	5.66	6.29	6.29	6.59	6.59	7.09	7.09
Particle Size (μ, M.D)	1550	1500	1100	1400	1100	1100	1300	1300
Traversal Time (min. - sec.)	3-12	4-22	3-18	3-30	5-10	5-40	4-18	4-18
Location of Pick-Up								
Simulant Picked up (μg.) on Various Sections of Uniforms								
Jacket								
Chest, left	8	5	39	4	5	31	9	15
Chest, right	9	3	31	3	8	43	6	18
Upper Abdomen, left	11	21	105	24	11	206	36	31
Upper Abdomen, right	23	14	175	26	25	101	12	45
Upper Arm, left	8	4	6	5	1	32	10	35
Upper Arm, right	15	5	55	13	4	9	6	4
Elbow, left	26	32	105	17	49	302	100	92
Elbow, right	26	27	49	45	70	79	51	97
Forearm, left	45	24	55	77	95	129	61	70
Forearm, right	55	29	106	98	179	54	49	109
Trousers								
Lower Abdomen, left	100	119	110	171	98	380	276	185
Lower Abdomen, right	83	100	210	210	173	79	50	83
Thigh, left	40	89	52	86	109	309	134	116
Thigh, right	42	117	58	112	38	117	51	130
Knee, left	18	51	67	61	171	284	79	87
Knee, right	27	88	90	67	112	103	66	69
Lower Leg, left	11	25	45	86	22	54	55	88
Lower Leg, right	11	27	45	95	22	31	23	29
Gloves								
Left	64	13	123	137	61	162	64	60
Right	67	59	106	128	92	135	89	37
Miscellaneous								
Rifle	6	3	7	5	4	10	3	6
Underwear								
Cuff, left					1	2	1	1
Cuff, right					10	1	8	1
Elbow					126	85	7	
Skin			0.4		0.2	0.3		0.4
TOTAL*	719	882	1582	1523	1202	2700	1175	1350
Pick-Up Factor**	0.254	0.311	0.503	0.684	0.364	0.814	0.331	0.381

REMARKS:

NOTE# Trial performed on frozen terrain at ground temperature 0°F.

*Total quantity of simulant picked up on jacket, trousers, and gloves.

**Pick-up factor equals percent of the ground contamination picked up on the uniform per meter of traversal.

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2

CHECK AND CRAWL TRIAL NO. 5

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TABLE 6

CREEP AND CRAWL TRIAL NO. 6

11 February 1958

Test Subject									
Height (in.)	67	75	67	65	78	69	70	69	68
Weight (lb.)	165	135	135	130	190	200	180	155	150
Uniform No.	60	89	1	79	80	71	61	71	58
Contamination: Density (g./sq. in.)	6.00	6.00	5.53	5.53	3.94	3.94	4.86	5.12	5.12
Particle Size (u. m.)	1300	1300	1300	1300	1100	1100	1300	1300	1300
Inversion Time (min. - sec.)	3-0	4-23	6-0	7-43	4-35	5-55	4-10	2-28	6-45
Location of Pick-up									
Simulant Picked up (wt.) on Various Sections of Uniform									
Jacket									
Chest, left	101	4	51	25	10	50	64	31	188
Chest, right	37	2	23	11	8	15	20	33	19
Upper Abdomen, left	159	32	104	210	167	138	373	248	372
Upper Abdomen, right	53	29	70	40	24	70	119	269	72
Upper Arm, left	38	0	29	55	7	18	65	28	77
Upper Arm, right	123	135	140	3	4	0	27	55	3
Elbow, left	106	109	72	12	79	44	91	76	113
Elbow, right	107	78	108	53	62	15	140	85	95
Forearm, left	62	76	176	373	85	25	116	179	211
Forearm, right				34	40	35	7	62	139
Trousers									
Lower Abdomen, left	233	122	226	60	311	271	49	100	200
Lower Abdomen, right	107	137	371	39	125	122	112	143	143
Thigh, left	54	86	85	137	204	159	110	150	110
Thigh, right	35	119	127	59	123	11	117	52	119
Knee, left	89	104	127	253	121	88	135	134	30
Knee, right	83	78	251	72	94	82	125	91	51
Lower Leg, left	55	33	57	116	94	92	101	109	100
Lower Leg, right	29	67	116	29	27	55	128	22	45
Gloves									
Left	137	104	202	217	10	256	99	140	108
Right	154	67	302	169	107	172	82	219	134
Miscellaneous									
Belt	7	6	9	9	38	10	19	7	25
Underwear									
Cuff, left	19								
Cuff, right	1								
Skin	2-1		0.2	3.5	1.3	0.9	0.1	2.5	1.4
TOTAL	1841	1330	2729	2224	1697	2174	2113	1982	2647
Pick-up Factor**	0.613	0.443	0.968	0.805	0.862	1.104	0.882	0.817	1.000
REMARKS:									1.229

*Total quantity of simulant picked up on jacket, trousers, and gloves.
**Pick-up factor equals percent of the ground contamination picked up on the uniform per meter of traversal.

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TABLE 6

CREEP AND CRAWL TRIAL NO. 6

11 February 1958

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Stimulant Pick-up (mg.) on Various Sections of Uniforms

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*Total quantity of siliant picked up on jacket, trousers, and gloves.
 *Pick-up factor equals percent of the ground contamination picked up on the uniform per meter of universal.

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TABLE 7

17 March 1958

	P	H	P	F	C
East Subgroup	69	69	65	70	67
Weight (lb.)	135	175	150	165	150
Weight (lb.)	171	175	150	165	150
Uniform No.	67	72	77	88	73
Contamination	67	5.09	5.13	60	1.05
Density (g./cc.)	1.180	1.180	1.180	1.180	1.180
Permeability	1.180	1.180	1.180	1.180	1.180
Initial Rate (lb./sec.)	1.180	1.180	1.180	1.180	1.180
Slant Picked up (No.)	1.180	1.180	1.180	1.180	1.180
Location of Pick-Up	1.180	1.180	1.180	1.180	1.180

STRUCTURE PLOTTED UP (mg.) ON VARIOUS SECTIONS OF UNIFORM

Location of Pick-Up

Height	Chest, left	Chest, right	Upper abdomen, left	Upper abdomen, right	Upper arm, left	Upper arm, right	Elbow, left	Elbow, right	Forearm, left	Forearm, right
12	12	12	32	31	3	3	27	26	15	15
12 1/2	12 1/2	12 1/2	32 1/2	31 1/2	3 1/2	3 1/2	27 1/2	26 1/2	15 1/2	15 1/2
13	13	13	33	32	4	4	28	27	16	16
13 1/2	13 1/2	13 1/2	33 1/2	32 1/2	4 1/2	4 1/2	28 1/2	27 1/2	16 1/2	16 1/2
14	14	14	34	33	5	5	29	28	17	17
14 1/2	14 1/2	14 1/2	34 1/2	33 1/2	5 1/2	5 1/2	29 1/2	28 1/2	17 1/2	17 1/2
15	15	15	35	34	6	6	30	29	18	18
15 1/2	15 1/2	15 1/2	35 1/2	34 1/2	6 1/2	6 1/2	30 1/2	29 1/2	18 1/2	18 1/2
16	16	16	36	35	7	7	31	30	19	19
16 1/2	16 1/2	16 1/2	36 1/2	35 1/2	7 1/2	7 1/2	31 1/2	30 1/2	19 1/2	19 1/2
17	17	17	37	36	8	8	32	31	20	20
17 1/2	17 1/2	17 1/2	37 1/2	36 1/2	8 1/2	8 1/2	32 1/2	31 1/2	20 1/2	20 1/2
18	18	18	38	37	9	9	33	32	21	21
18 1/2	18 1/2	18 1/2	38 1/2	37 1/2	9 1/2	9 1/2	33 1/2	32 1/2	21 1/2	21 1/2
19	19	19	39	38	10	10	34	33	22	22
19 1/2	19 1/2	19 1/2	39 1/2	38 1/2	10 1/2	10 1/2	34 1/2	33 1/2	22 1/2	22 1/2
20	20	20	40	39	11	11	35	34	23	23
20 1/2	20 1/2	20 1/2	40 1/2	39 1/2	11 1/2	11 1/2	35 1/2	34 1/2	23 1/2	23 1/2
21	21	21	41	40	12	12	36	35	24	24
21 1/2	21 1/2	21 1/2	41 1/2	40 1/2	12 1/2	12 1/2	36 1/2	35 1/2	24 1/2	24 1/2
22	22	22	42	41	13	13	37	36	25	25
22 1/2	22 1/2	22 1/2	42 1/2	41 1/2	13 1/2	13 1/2	37 1/2	36 1/2	25 1/2	25 1/2
23	23	23	43	42	14	14	38	37	26	26
23 1/2	23 1/2	23 1/2	43 1/2	42 1/2	14 1/2	14 1/2	38 1/2	37 1/2	26 1/2	26 1/2
24	24	24	44	43	15	15	39	38	27	27
24 1/2	24 1/2	24 1/2	44 1/2	43 1/2	15 1/2	15 1/2	39 1/2	38 1/2	27 1/2	27 1/2
25	25	25	45	44	16	16	40	39	28	28
25 1/2	25 1/2	25 1/2	45 1/2	44 1/2	16 1/2	16 1/2	40 1/2	39 1/2	28 1/2	28 1/2
26	26	26	46	45	17	17	41	40	29	29
26 1/2	26 1/2	26 1/2	46 1/2	45 1/2	17 1/2	17 1/2	41 1/2	40 1/2	29 1/2	29 1/2
27	27	27	47	46	18	18	42	41	30	30
27 1/2	27 1/2	27 1/2	47 1/2	46 1/2	18 1/2	18 1/2	42 1/2	41 1/2	30 1/2	30 1/2
28	28	28	48	47	19	19	43	42	31	31
28 1/2	28 1/2	28 1/2	48 1/2	47 1/2	19 1/2	19 1/2	43 1/2	42 1/2	31 1/2	31 1/2
29	29	29	49	48	20	20	44	43	32	32
29 1/2	29 1/2	29 1/2	49 1/2	48 1/2	20 1/2	20 1/2	44 1/2	43 1/2	32 1/2	32 1/2
30	30	30	50	49	21	21	45	44	33	33
30 1/2	30 1/2	30 1/2	50 1/2	49 1/2	21 1/2	21 1/2	45 1/2	44 1/2	33 1/2	33 1/2
31	31	31	51	50	22	22	46	45	34	34
31 1/2	31 1/2	31 1/2	51 1/2	50 1/2	22 1/2	22 1/2	46 1/2	45 1/2	34 1/2	34 1/2
32	32	32	52	51	23	23	47	46	35	35
32 1/2	32 1/2	32 1/2	52 1/2	51 1/2	23 1/2	23 1/2	47 1/2	46 1/2	35 1/2	35 1/2
33	33	33	53	52	24	24	48	47	36	36
33 1/2	33 1/2	33 1/2	53 1/2	52 1/2	24 1/2	24 1/2	48 1/2	47 1/2	36 1/2	36 1/2
34	34	34	54	53	25	25	49	48	37	37
34 1/2	34 1/2	34 1/2	54 1/2	53 1/2	25 1/2	25 1/2	49 1/2	48 1/2	37 1/2	37 1/2
35	35	35	55	54	26	26	50	49	38	38
35 1/2	35 1/2	35 1/2	55 1/2	54 1/2	26 1/2	26 1/2	50 1/2	49 1/2	38 1/2	38 1/2
36	36	36	56	55	27	27	51	50	39	39
36 1/2	36 1/2	36 1/2	56 1/2	55 1/2	27 1/2	27 1/2	51 1/2	50 1/2	39 1/2	39 1/2
37	37	37	57	56	28	28	52	51	40	40
37 1/2	37 1/2	37 1/2	57 1/2	56 1/2	28 1/2	28 1/2	52 1/2	51 1/2	40 1/2	40 1/2
38	38	38	58	57	29	29	53	52	41	41
38 1/2	38 1/2	38 1/2	58 1/2	57 1/2	29 1/2	29 1/2	53 1/2	52 1/2	41 1/2	41 1/2
39	39	39	59	58	30	30	54	53	42	42
39 1/2	39 1/2	39 1/2	59 1/2	58 1/2	30 1/2	30 1/2	54 1/2	53 1/2	42 1/2	42 1/2
40	40	40	60	59	31	31	55	54	43	43
40 1/2	40 1/2	40 1/2	60 1/2	59 1/2	31 1/2	31 1/2	55 1/2	54 1/2	43 1/2	43 1/2
41	41	41	61	60	32	32	56	55	44	44
41 1/2	41 1/2	41 1/2	61 1/2	60 1/2	32 1/2	32 1/2	56 1/2	55 1/2	44 1/2	44 1/2
42	42	42	62	61	33	33	57	56	45	45
42 1/2	42 1/2	42 1/2	62 1/2	61 1/2	33 1/2	33 1/2	57 1/2	56 1/2	45 1/2	45 1/2
43	43	43	63	62	34	34	58	57	46	46
43 1/2	43 1/2	43 1/2	63 1/2	62 1/2	34 1/2	34 1/2	58 1/2	57 1/2	46 1/2	46 1/2
44	44	44	64	63	35	35	59	58	47	47
44 1/2	44 1/2	44 1/2	64 1/2	63 1/2	35 1/2	35 1/2	59 1/2	58 1/2	47 1/2	47 1/2
45	45	45	65	64	36	36	60	59	48	48
45 1/2	45 1/2	45 1/2	65 1/2	64 1/2	36 1/2	36 1/2	60 1/2	59 1/2	48 1/2	48 1/2
46	46	46	66	65	37	37	61	60	49	49
46 1/2	46 1/2	46 1/2	66 1/2	65 1/2	37 1/2	37 1/2	61 1/2	60 1/2	49 1/2	49 1/2
47	47	47	67	66	38	38	62	61	50	50
47 1/2	47 1/2	47 1/2	67 1/2	66 1/2	38 1/2	38 1/2	62 1/2	61 1/2	50 1/2	50 1/2
48	48	48	68	67	39	39	63	62	51	51
48 1/2	48 1/2	48 1/2	68 1/2	67 1/2	39 1/2	39 1/2	63 1/2	62 1/2	51 1/2	51 1/2
49	49	49	69	68	40	40	64	63	52	52
49 1/2	49 1/2	49 1/2	69 1/2	68 1/2	40 1/2	40 1/2	64 1/2	63 1/2	52 1/2	52 1/2
50	50	50	70	69	41	41	65	64	53	53
50 1/2	50 1/2	50 1/2	70 1/2	69 1/2	41 1/2	41 1/2	65 1/2	64 1/2	53 1/2	53 1/2
51	51	51	71	70	42	42	66	65	54	54
51 1/2	51 1/2	51 1/2	71 1/2	70 1/2	42 1/2	42 1/2	66 1/2	65 1/2	54 1/2	54 1/2
52	52	52	72	71	43	43	67	66	55	55
52 1/2	52 1/2	52 1/2	72 1/2	71 1/2	43 1/2	43 1/2	67 1/2	66 1/2	55 1/2	55 1/2
53	53	53	73	72	44	44	68	67	56	56
53 1/2	53 1/2	53 1/2	73 1/2	72 1/2	44 1/2	44 1/2	68 1/2	67 1/2	56 1/2	56 1/2
54	54	54	74	73	45	45	69	68	57	57
54 1/2	54 1/2	54 1/2	74 1/2	73 1/2	45 1/2	45 1/2	69 1/2	68 1/2	57 1/2	57 1/2
55	55	55	75	74	46	46	70	69	58	58
55 1/2	55 1/2	55 1/2	75 1/2	74 1/2	46 1/2	46 1/2	70 1/2	69 1/2	58 1/2	58 1/2
56	56	56	76	75	47	47	71	70	59	59
56 1/2	56 1/2	56 1/2	76 1/2	75 1/2	47 1/2	47 1/2	71 1/2	70 1/2	59 1/2	59 1/2
57	57	57	77	76	48	48	72	71	60	60
57 1/2	57 1/2	57 1/2	77 1/2	76 1/2	48 1/2	48 1/2	72 1/2	71 1/2	60 1/2	60 1/2
58	58	58	78	77	49	49	73	72	61	61
58 1/2	58 1/2	58 1/2	78 1/2	77 1/2	49 1/2	49 1/2	73 1/2	72 1/2	61 1/2	61 1/2
59	59	59	79	78	50	50	74	73	62	62
59 1/2	59 1/2	59 1/2	79 1/2	78 1/2	50 1/2	50 1/2	74 1/2	73 1/2	62 1/2	62 1/2
60	60	60	80	79	51	51	75	74	63	63
60 1/2	60 1/2	60 1/2	80 1/2	79 1/2	51 1/2	51 1/2	75 1/2	74 1/2	63 1/2	63 1/2
61	61	61	81	80	52	52	76	75	64	64
61 1/2	61 1/2	61 1/2	81 1/2	80 1/2	52 1/2	52 1/2	76 1/2	75 1/2	64 1/2	64 1/2
62	62	62	82	81	53	53	77	76	65	65
62 1/2	62 1/2	62 1/2	82 1/2	81 1/2	53 1/2	53 1/2	77 1/2	76 1/2	65 1/2	65 1/2
63	63	63	83	82	54	54	78	77	66	66
63 1/2	63 1/2	63 1/2	83 1/2	82 1/2	54 1/2	54 1/2	78 1/2	77 1/2	66 1/2	66 1/2
64	64	64	84	83	55	55	79	78	67	67
64 1/2	64 1/2	64 1/2	84 1/2	83 1/2	55 1/2	55 1/2	79 1/2	78 1/2	67 1/2	67 1/2
65	65	65	85	84	56	56	80	79	68	68
65 1/2	65 1/2	65 1/2	85 1/2	84 1/2	56 1/2	56 1/2	80 1/2	79 1/2	68 1/2	68 1/2
66	66	66	86	85	57	57	81	80	69	69
66 1/2	66 1/2	66 1/2	86 1/2	85 1/2	57 1/2	57 1/2	81 1/2	80 1/2	69 1/2	69 1/2
67	67	67	87	86	58	58	82	81	70	70
67 1/2	67 1/2	67 1/2	87 1/2	86 1/2	58 1/2	58 1/2	82 1/2	81 1/2	70 1/2	70 1/2
68	68	68	88	87	59	59	83	82	71	71
68 1/2	68 1/2	68 1/2	88 1/2	87 1/2	59 1/2	59 1/2	83 1/2	82 1/2	71 1/2	71 1/2
69	69	69	89	88	60	60	84	83	72	72
69 1/2	69 1/2	69 1/2	89 1/2	88 1/2	60 1/2	60 1/2	84 1/2	83 1/2	72 1/2	72 1/2
70	70	70	90	89	61	61	85	84	73	73
70 1/2	70 1/2	70 1/2	90 1/2	89 1/2	61 1/2	61 1/2	85 1/2	84 1/2	73 1/2	73 1/2
71	71	71	91	90	62	62	86	85	74	74
71 1/2	71 1/2	71 1/2	91 1/2	90 1/2	62 1/2	62 1/2</				

IT'S ALL ABOUT

Lower Abdomen, left	125	230	72	0	137	119
Lower Abdomen, right	127	232	72	0	143	121
Thigh, left	124	1	25	0	57	50
Thigh, right	79	74	13	0	67	55
Knee, left	351	259	38	0	56	62
Knee, right	119	72	36	0	54	62
Lower Leg, left	56	132	120	125	14	100
Lower Leg, right	55	131	7	11	16	25
Lower Leg,	16	17	1	11	17	20

Page 1

Miscellaneous		Rifle	
137	112	5	11
169	200	9	9
	95	29	72
	107	27	108
			64
			115

Answer:

Conf., Left	h ₁ L	g ₁ g ₂	h ₂ h ₃	g ₃ g ₄	h ₄ h ₅	g ₅ g ₆	h ₆ h ₇	g ₇ g ₈	h ₈ h ₉	g ₉ g ₁₀	h ₁₀ h ₁₁	g ₁₁ g ₁₂	h ₁₂ h ₁₃	g ₁₃ g ₁₄	h ₁₄ h ₁₅	g ₁₅ g ₁₆	h ₁₆ h ₁₇	g ₁₇ g ₁₈	h ₁₈ h ₁₉	g ₁₉ g ₂₀	h ₂₀ h ₂₁	g ₂₁ g ₂₂	h ₂₂ h ₂₃	g ₂₃ g ₂₄	h ₂₄ h ₂₅	g ₂₅ g ₂₆	h ₂₆ h ₂₇	g ₂₇ g ₂₈	h ₂₈ h ₂₉	g ₂₉ g ₃₀	h ₃₀ h ₃₁	g ₃₁ g ₃₂	h ₃₂ h ₃₃	g ₃₃ g ₃₄	h ₃₄ h ₃₅	g ₃₅ g ₃₆	h ₃₆ h ₃₇	g ₃₇ g ₃₈	h ₃₈ h ₃₉	g ₃₉ g ₄₀	h ₄₀ h ₄₁	g ₄₁ g ₄₂	h ₄₂ h ₄₃	g ₄₃ g ₄₄	h ₄₄ h ₄₅	g ₄₅ g ₄₆	h ₄₆ h ₄₇	g ₄₇ g ₄₈	h ₄₈ h ₄₉	g ₄₉ g ₅₀	h ₅₀ h ₅₁	g ₅₁ g ₅₂	h ₅₂ h ₅₃	g ₅₃ g ₅₄	h ₅₄ h ₅₅	g ₅₅ g ₅₆	h ₅₆ h ₅₇	g ₅₇ g ₅₈	h ₅₈ h ₅₉	g ₅₉ g ₆₀	h ₆₀ h ₆₁	g ₆₁ g ₆₂	h ₆₂ h ₆₃	g ₆₃ g ₆₄	h ₆₄ h ₆₅	g ₆₅ g ₆₆	h ₆₆ h ₆₇	g ₆₇ g ₆₈	h ₆₈ h ₆₉	g ₆₉ g ₇₀	h ₇₀ h ₇₁	g ₇₁ g ₇₂	h ₇₂ h ₇₃	g ₇₃ g ₇₄	h ₇₄ h ₇₅	g ₇₅ g ₇₆	h ₇₆ h ₇₇	g ₇₇ g ₇₈	h ₇₈ h ₇₉	g ₇₉ g ₈₀	h ₈₀ h ₈₁	g ₈₁ g ₈₂	h ₈₂ h ₈₃	g ₈₃ g ₈₄	h ₈₄ h ₈₅	g ₈₅ g ₈₆	h ₈₆ h ₈₇	g ₈₇ g ₈₈	h ₈₈ h ₈₉	g ₈₉ g ₉₀	h ₉₀ h ₉₁	g ₉₁ g ₉₂	h ₉₂ h ₉₃	g ₉₃ g ₉₄	h ₉₄ h ₉₅	g ₉₅ g ₉₆	h ₉₆ h ₉₇	g ₉₇ g ₉₈	h ₉₈ h ₉₉	g ₉₉ g ₁₀₀	h ₁₀₀ h ₁₀₁	g ₁₀₁ g ₁₀₂	h ₁₀₂ h ₁₀₃	g ₁₀₃ g ₁₀₄	h ₁₀₄ h ₁₀₅	g ₁₀₅ g ₁₀₆	h ₁₀₆ h ₁₀₇	g ₁₀₇ g ₁₀₈	h ₁₀₈ h ₁₀₉	g ₁₀₉ g ₁₁₀	h ₁₁₀ h ₁₁₁	g ₁₁₁ g ₁₁₂	h ₁₁₂ h ₁₁₃	g ₁₁₃ g ₁₁₄	h ₁₁₄ h ₁₁₅	g ₁₁₅ g ₁₁₆	h ₁₁₆ h ₁₁₇	g ₁₁₇ g ₁₁₈	h ₁₁₈ h ₁₁₉	g ₁₁₉ g ₁₂₀	h ₁₂₀ h ₁₂₁	g ₁₂₁ g ₁₂₂	h ₁₂₂ h ₁₂₃	g ₁₂₃ g ₁₂₄	h ₁₂₄ h ₁₂₅	g ₁₂₅ g ₁₂₆	h ₁₂₆ h ₁₂₇	g ₁₂₇ g ₁₂₈	h ₁₂₈ h ₁₂₉	g ₁₂₉ g ₁₃₀	h ₁₃₀ h ₁₃₁	g ₁₃₁ g ₁₃₂	h ₁₃₂ h ₁₃₃	g ₁₃₃ g ₁₃₄	h ₁₃₄ h ₁₃₅	g ₁₃₅ g ₁₃₆	h ₁₃₆ h ₁₃₇	g ₁₃₇ g ₁₃₈	h ₁₃₈ h ₁₃₉	g ₁₃₉ g ₁₄₀	h ₁₄₀ h ₁₄₁	g ₁₄₁ g ₁₄₂	h ₁₄₂ h ₁₄₃	g ₁₄₃ g ₁₄₄	h ₁₄₄ h ₁₄₅	g ₁₄₅ g ₁₄₆	h ₁₄₆ h ₁₄₇	g ₁₄₇ g ₁₄₈	h ₁₄₈ h ₁₄₉	g ₁₄₉ g ₁₅₀	h ₁₅₀ h ₁₅₁	g ₁₅₁ g ₁₅₂	h ₁₅₂ h ₁₅₃	g ₁₅₃ g ₁₅₄	h ₁₅₄ h ₁₅₅	g ₁₅₅ g ₁₅₆	h ₁₅₆ h ₁₅₇	g ₁₅₇ g ₁₅₈	h ₁₅₈ h ₁₅₉	g
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157819.

NOVOK. Terrain covering consisted of dead, dry, matted grass.

total quantity of a student picked up on a subject. + month after a subject. + month after a subject.

pick-up factor equals percent of the ground contamination picked up on the uniform meter of traversal.

CONFIDENTIAL

17 March 1958

CRISP AND CHAML FULL NO. 7									
17 March 1958									
Test Subject	H	P	C	F	F	F	F	F	F
Height (in.)	69	68	75	69	68	70	67	70	70
Weight (lb.)	175	195	195	155	155	180	155	180	180
Uniform No.	31	62	13	72	72	88	45	45	45
Contamination Density (g./sq. cm.)	6.15	1.58	5.79	5.89	6.18	5.57	4.45	4.45	4.45
Particle Size (µ, 450)	1180	1180	1275	1275	1275	1350	1200	1200	1200
Interval Time (min. - sec.)	1-0	1-0	1-0	1-0	1-0	5-20	3-0	3-0	3-0
Standard Picked up (mg.) on Various Sections of Uniforms									
Location of Pick-Up									
Jacket									
Chest, left	142	13	3	7	11	52	72	72	72
Chest, right	71	0	1	0	4	30	25	25	25
Upper Abdomen, left	277	383	125	151	34	151	220	220	220
Upper Abdomen, right	116	44	42	73	16	40	113	113	113
Upper Arm, left	11	33	30	0	7	2	10	10	10
Upper Arm, right	8	5	3	10	0	2	11	11	11
Elbow, left	219	238	305	191	106	194	305	305	305
Elbow, right	116	151	154	176	57	120	305	305	305
Forearm, left	115	62	90	8	8	111	38	38	38
Forearm, right	32	108	94	52	0	60	49	49	49
Trousers									
Lower Abdomen, left	125	283	230	71	0	137	24	24	24
Lower Abdomen, right	127	32	120	25	0	113	59	59	59
Thigh, left	104	113	4	25	0	51	52	52	52
Thigh, right	79	33	74	54	0	67	58	58	58
Knee, left	354	270	259	54	19	86	67	67	67
Knee, right	119	118	77	172	15	28	53	53	53
Lower Leg, left	86	43	113	40	5	40	14	14	14
Lower Leg, right	65	36	37	17	11	16	25	25	25
Gloves									
Left	157	112	75	136	118	72	64	64	64
Right	169	200	157	138	118	79	115	115	115
Miscellaneous									
Rifle	20	20	2	15	9	11	9	9	9
Underwear									
Cuff, left	144	607	125	136	146	77	104	104	104
Cuff, right	1	302	302	237	37	2	43	43	43
Skin									
TOILET	0.7	10.0		0.6	1.0	0.9	1.2	1.2	1.2
TOTAL	2311	2285	1871	1378	173	1102	1301	1301	1301
Pick-Up Factors	0.749	0.710	0.636	0.669	0.605	0.568	0.584	0.584	0.584
Remarks									
NOTE: Terrain covering consisted of dead, dry, sated grass.									
Critical quantity of sulant picked up on jacket, trousers, and gloves.									
Pick-up factor equals percent of the ground contamination picked up on the uniform per meter of traversal.									

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2

11 April 1958

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TABLE 3

ORANGE AND GRAY UNIFORM NO. 8

Test Subject	P	G	F	B	D	A	R	I	Q
Height (in.)	68	75	70	69	67	71	67	65	70
Weight (lbs.)	195	195	180	185	185	185	180	180	160
Uniform No.	160	139	59	15	34	36	33	37	22
Contamination Density (g./sq. in.)	2.38	2.33	2.13	2.58	2.53	2.45	2.03	2.03	2.08
Particle Size (u. in.)	9.0	9.0	10.0	9.0	9.0	9.0	9.0	9.0	9.0
Traversal Time (in. - sec.)	1-10	1-10	2-15	2-30	2-20	3-12	2-30	2-30	2-30
Simulant picked up (wt.) on Various Sections of Uniforms									
Location of Pick-up									
Jacket									
Chest, left	20	13	23	16	19	16	35	13	11
Chest, right	6	0	20	1	8	6	9	6	12
Upper Abdomen, left	87	53	132	16	117	130	76	30	140
Upper Abdomen, right	295	36	66	19	28	92	51	20	60
Upper Arm, left	53	16	25	6	23	16	10	56	6
Upper Arm, right	11	12	13	19	12	14	8	11	11
Elbow, left	130	92	110	68	93	158	89	79	105
Elbow, right	76	79	110	117	53	111	85	70	115
Shoulder, left	67	60	13	12	55	61	83	61	70
Shoulder, right	79	69	106	12	37	71	67	83	13
Trousers									
Lower abdomen, left	286	113	101	100	134	116	77	20	216
Lower abdomen, right	50	139	59	70	81	116	93	13	11
Thigh, left	185	66	71	27	47	195	100	17	93
Thigh, right	188	64	50	67	21	98	62	22	16
Knee, left	131	57	41	61	64	231	106	63	118
Knee, right	63	50	34	184	39	193	65	71	13
Lower leg, left	115	103	11	35	39	88	70	24	106
Lower leg, right	272	10	16	31	1	43	35	16	74
Gloves									
Left	79	50	34	63	107	89	67	70	54
Right	166	27	117	144	91	230	94	69	115
Miscellaneous									
Knife	17	15	11	13	24	25	14	28	28
Underwear									
Cuff, left	2.0	38				0.2	0.7	2.2	10.8
Cuff, right	0.3	1.2	0.4	0.2	1.0	0.2	17.0	3.1	5.2
Elbow						0.7	1.6	1.2	
Wrist	0.5		0.2	0.6					
Thigh									
Skin	0.4	3.5	0.2	1.4	0.1	0.3	0.1	0.2	0.2
Foot	21.8	10.2	11.0	10.4	12.6	19.1	12.7	7.6	11.4
Foot	1.816	1.024	1.380	0.829	0.939	1.622	1.288	0.784	1.108
Pick-up Factors									

Total quantity of simulant picked up on jacket, trousers, and gloves.

Reference for details of the test on contamination of the uniform for the use of the uniform.

14 April 1958

TABLE B
DEEP AND CRUEL TRAIL NO. 3

	P	C	E	B	D	A	F	I	Q
Test Subject	68	75	70	69	67	72	67	65	70
Weight (lbs.)	175	192	180	155	185	172	130	150	160
Uniform No.	39	39	59	4	34	152	33	37	22
Contamination Density (g./sq.in.)	2.38	2.34	2.13	2.59	2.59	2.15	2.03	2.03	2.08
Particle Size (u, MO)	940	940	1100	940	940	940	940	940	940
Traversal Time (min. - sec.)	4-10	4-10	2-15	2-30	2-22	3-12	2-30	5-15	5-15
Stellant Pick-up (%) on Various Sections of Uniforms									
Location of Pick-up									
Jacket									
Chest, left	20	13	23	16	19	16	35	13	14
Chest, right	6	0	20	1	8	6	9	1	12
Upper Abdomen, left	295	23	132	156	110	130	76	30	120
Upper Abdomen, right	51	28	66	1	28	92	51	9	60
Upper Arm, left	11	12	13	19	12	16	10	56	6
Upper Arm, right	18	92	115	62	93	158	8	6	11
Shoulder, left	12	12	117	117	53	111	85	79	102
Shoulder, right	67	78	143	11	55	61	93	70	5
Forearm, left	79	49	106	12	37	71	67	61	73
Forearm, right								83	43
Trousers									
Lower Abdomen, left	286	113	101	109	184	115	77	20	216
Lower Abdomen, right	50	139	59	70	61	116	93	13	11
Thigh, left	175	66	71	77	47	152	160	17	93
Thigh, right	88	14	50	67	21	182	49	22	16
Knee, left	131	97	123	61	24	231	106	71	118
Knee, right	49	57	51	14	32	123	65	21	13
Lower Leg, left	113	103	127	3	22	96	70	24	106
Lower Leg, right	272	10	17	31	11	43	35	16	74
Gloves									
Left	27	59	34	42	127	59	62	70	54
Right	17	37	17	11	94	239	94	69	115
Miscellaneous									
Rifle	17	15	11	13	24	25	14		28
Footwear									
Left, left	20	38							
Left, right	0.3	3.2			1.0	0.2	0.7	2.2	12.8
Shoelace	0.5				0.6	0.7	1.0	1.1	5.2
Thigh	0.5								
Skin	0.5	1.6	0.2	1.0	0.1	0.3	0.1	0.2	0.2
TOTAL*	2198	1212	1170	1574	1216	1371	1777	736	1404
Pick-up Factors**	1.816	1.024	1.250	0.909	0.239	1.622	1.258	0.794	1.105

*Total quantity of stellant picked up on jacket, trousers, and gloves.

**Pick-up factor equals percent of the total contamination picked up on the uniform or other of traversal.

Remarks:

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TABLE 2

GRAVE AND GRAVE IDENT. NO. 2

17 April 1958

Test Subject	8	6	5	7	4	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800	801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820	821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840	841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858	859	860	861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880	881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900	901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920	921	922	923	924	925	926	927	928	929	930	931	932	933	934	935	936	937	938	939	940	941	942	943	944	945	946	947	948	949	950	951	952	953	954	955	956	957	958	959	960	961	962	963	964	965	966	967	968	969	970	971	972	973	974	975	976	977	978	979	980	981	982	983	984	985	986	987	988	989	990	991	992	993	994	995	996	997	998	999	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021	1022	1023	1024	1025	1026	1027	1028	1029	1030	1031	1032	1033	1034	1035	1036	1037	1038	1039	1040	1041	1042	1043	1044	1045	1046	1047	1048	1049	1050	1051	1052	1053	1054	1055	1056	1057	1058	1059	1060	1061	1062	1063	1064	1065	1066	1067	1068	1069	1070	1071	1072	1073	1074	1075	1076	1077	1078	1079	1080	1081	1082	1083	1084	1085	1086	1087	1088	1089	1090	1091	1092	1093	1094	1095	1096	1097	1098	1099	1100	1101	1102	1103	1104	1105	1106	1107	1108	1109	1110	1111	1112	1113	1114	1115	1116	1117	1118	1119	1120	1121	1122	1123	1124	1125	1126	1127	1128	1129	1130	1131	1132	1133	1134	1135	1136	1137	1138	1139	1140	1141	1142	1143	1144	1145	1146	1147	1148	1149	1150	1151	1152	1153	1154	1155	1156	1157	1158	1159	1160	1161	1162	1163	1164	1165	1166	1167	1168	1169	1170	1171	1172	1173	1174	1175	1176	1177	1178	1179	1180	1181	1182	1183	1184	1185	1186	1187	1188	1189	1190	1191	1192	1193	1194	1195	1196	1197	1198	1199	1200	1201	1202	1203	1204	1205	1206	1207	1208	1209	1210	1211	1212	1213	1214	1215	1216	1217	1218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17 April 1958

CREEP AND CRIME, TRIAL NO. 2

Test Subject:
Height (in.)
Weight (lbs.)
Uniform No.
Contamination Band V. (cc./sq. ft.)
Particle Size (µm) (avg.)
Particle Size (µm) (max.)

69
155
3
13.6
25.10
1-35
3-35

Location of Picked-up

Simulant Picked up (µg.) on Various Sections of Uniform

Neck

Shirt, left
Chest, right
Upper abdomen, left
Upper abdomen, right
Upper arm, left
Upper arm, right
Elbow, left
Elbow, right
Forearm, left
Forearm, right

28
28
23
35
24
17
207
332
13
12

Trousers

Lower abdomen, left
Lower abdomen, right
Thigh, left
Thigh, right
Knee, left
Knee, right
Lower leg, left
Lower leg, right

77
39
690
169
11
25
278
116
150
137

Shoes

Left
Right

95
16
140
172
11
12
160
200
281
132

Miscellaneous

Rifle

126
231
273
67
315
134
252
56

Underwear

Cuff, left
Cuff, right
Elbow
Ankle
Heel
Instep

14
12
13
0.8
2.8
0.3
1.8

Skin

134
297

TOTALS

134
297

Pick-up Factor

0.773

REMARKS

Total quantity of simulant picked up on jacket, trousers, and shoes.
Pick-up factor equals percent of the ground contamination picked up on the uniform per meter of unravel.

CONFIDENTIAL

2

CONFIDENTIAL

TABLE 10

CNSP AND CRAM TRIAL NO. 10

15 May 1953

Test Subject	H	J	D	F	G	I	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT	BU	BV	BW	BX	BY	BZ	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CZ	DA	DB	DC	DD	DE	DF	DG	DH	DI	DJ	DK	DL	DM	DN	DO	DP	DQ	DR	DS	DT	DU	DV	DW	DX	DY	DZ	EA	EB	EC	ED	EE	EF	EG	EH	EI	EJ	EK	EL	EM	EN	EO	EP	EQ	ER	ES	ET	EU	EV	EW	EX	EY	EZ	FA	FB	FC	FD	FE	FF	FG	FH	FI	FJ	FK	FL	FM	FN	FO	FP	FQ	FR	FS	FT	FU	FV	FW	FX	FY	FZ	GA	GB	GC	GD	GE	GF	GG	GH	GI	GJ	GK	GL	GM	GN	GO	GP	GQ	GR	GS	GT	GU	GV	GW	GX	GY	GZ	HA	HB	HC	HD	HE	HF	HG	HH	HI	HJ	HK	HL	HM	HN	HO	HP	HQ	HR	HS	HT	HU	HV	HW	HX	HY	HZ	IA	IB	IC	ID	IE	IF	IG	IH	II	IJ	IK	IL	IM	IN	IO	IP	IQ	IR	IS	IT	IU	IV	IW	IX	IY	IZ	JA	JB	JC	JD	JE	JF	JG	JH	JI	IJ	JK	KL	KM	KN	KO	KP	KQ	KR	KS	KT	KU	KV	KW	KX	KY	KZ	LA	LB	LC	LD	LE	LF	LG	LH	LI	LJ	LK	LM	LN	LO	LP	LQ	LR	LS	LT	LU	LV	LW	LX	LY	LZ	MA	MB	MC	MD	ME	MF	MG	MH	MI	MJ	MK	ML	MM	MN	MO	MP	MQ	MR	MS	MT	MU	MV	MW	MX	MY	MZ	NA	NB	NC	ND	NE	NF	NG	NH	NI	NJ	NK	NL	NM	NN	NO	NP	NQ	NR	NS	NT	NU	NV	NW	NX	NY	NZ	OA	OB	OC	OD	OE	OF	OG	OH	OI	OJ	OK	OL	OM	ON	OO	OP	OQ	OR	OS	OT	OU	OV	OW	OX	OY	OZ	PA	PB	PC	PD	PE	PF	PG	PH	PI	PJ	PK	PL	PM	PN	PO	PP	PQ	PR	PS	PT	PU	PV	PW	PX	PY	PZ	QA	QB	QC	QD	QE	QF	QG	QH	QI	QJ	QK	QL	QM	QN	QO	QP	QQ	QR	QS	QT	QU	QV	QW	QX	QY	QZ	RA	RB	RC	RD	RE	RF	RG	RH	RI	RJ	RK	RL	RM	RN	RO	RP	RQ	RR	RS	RT	RU	RV	RW	RX	RY	RZ	SA	SB	SC	SD	SE	SF	SG	SH	SI	SJ	SK	SL	SM	SN	SO	SP	SQ	SR	SS	ST	SU	SV	SW	SX	SY	SZ	TA	TB	TC	TD	TE	TF	TG	TH	TI	TJ	TK	TL	TM	TN	TO	TP	TQ	TR	TS	TT	TU	TV	TW	TX	TY	TZ	UA	UB	UC	UD	UE	UF	UG	UH	UI	UJ	UK	UL	UM	UN	UO	UP	UQ	UR	US	UT	UU	UV	UW	UX	UY	UZ	VA	VB	VC	VD	VE	VF	VG	VH	VI	VJ	VK	VL	VM	VN	VO	VP	VQ	VR	VS	VT	VU	VV	VW	VX	VY	VZ	WA	WB	WC	WD	WE	WF	WG	WH	WI	WJ	WK	WL	WM	WN	WO	WP	WQ	WR	WS	WT	WU	WV	WW	WX	WY	WZ	XA	XB	XC	XD	XE	XF	YG	YH	YI	YJ	YK	YL	YM	YN	YO	YP	YQ	YR	YS	YT	YU	YV	YW	YX	YY	YZ	ZA	ZB	ZC	ZD	ZE	ZF	ZG	ZH	ZI	ZJ	ZK	ZL	ZM	ZN	ZO	ZP	ZQ	ZR	ZS	ZT	ZU	ZV	ZW	ZX	ZY	ZZ	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT	BU	BV	BW	BX	BY	BZ	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CZ	DA	DB	DC	DD	DE	DF	DG	DH	DI	DJ	DK	DL	DM	DN	DO	DP	DQ	DR	DS	DT	DU	DV	DW	DX	DY	DZ	EA	EB	EC	ED	EE	EF	EG	EH	EI	EJ	EK	EL	EM	EN	EO	EP	EQ	ER	ES	ET	EU	EV	EW	EX	EY	EZ	FA	FB	FC	FD	FE	FF	FG	FH	FI	FJ	FK	FL	FM	FN	FO	FP	FQ	FR	FS	FT	FU	FV	FW	FX	FY	FZ	GA	GB	GC	GD	GE	GF	GG	GH	GI	GJ	GK	GL	GM	GN	GO	GP	GQ	GR	GS	GT	GU	GV	GW	GX	GY	GZ	HA	HB	HC	HD	HE	HF	HG	HH	HI	HJ	HK	HL	HM	HN	HO	HP	HQ	HR	HS	HT	HU	HV	HW	HX	HY	HZ	IA	IB	IC	ID	IE	IF	IG	IH	II	IJ	IK	IL	IM	IN	IO	IP	IQ	IR	IS	IT	IU	IV	IW	IX	IY	IZ	JA	JB	JC	JD	JE	JF	JG	JH	JI	IJ	JK	KL	KM	KN	KO	KP	KQ	KR	KS	KT	KU	KV	KW	KX	KY	KZ	LA	LB	LC	LD	LE	LF	LG	LH	LI	LJ	LK	LM	LN	LO	LP	LQ	LR	LS	LT	LU	LV	LW	LX	LY	LZ	MA	MB	MC	MD	ME	MF	MG	MH	MI	MJ	MK	ML	MM	MN	MO	MP	MQ	MR	MS	MT	MU	MV	MW	MX	MY	MZ	NA	NB	NC	ND	NE	NF	NG	NH	NI	NJ	NK	NL	NM	NN	NO	NP	NQ	NR	NS	NT	NU	NV	NW	NX	NY	NZ	OA	OB	OC	OD	OE	OF	OG	OH	OI	OJ	OK	OL	OM	ON	OO	OP	OQ	OR	OS	OT	OU	OV	OW	OX	OY	OZ	PA	PB	PC	PD	PE	PF	PG	PH	PI	PJ	PK	PL	PM	PN	PO	PP	PQ	PR	PS	PT	PU	PV	PW	PX	PY	PZ	QA	QB	QC	QD	QE	QF	QG	QH	QI	QJ	QK	QL	QM	QN	QO	QP	QQ	QR	QS	QT	QU	QV	QW	QX	QY	QZ	RA	RB	RC	RD	RE	RF	RG	RH	RI	RJ	RK	RL	RM	RN	RO	RP	RQ	RR	RS	RT	RU	RV	RW	RX	RY	RZ	SA	SB	SC	SD	SE	SF	SG	SH	SI	SJ	SK	SL	SM	SN	SO	SP	SQ	SR	SS	ST	SU	SV	SW	SX	SY	SZ	TA	TB	TC	TD	TE	TF	TG	TH	TI	TJ	TK	TL	TM	TN	TO	TP	TQ	TR	TS	TT	TU	TV	TW	TX	TY	TZ	UA	UB	UC	UD	UE	UF	UG	UH	UI	UJ	UK	UL	UM	UN	UO	UP	UQ	UR	US	UT	UU	UV	UW	UX	UY	UZ	VA	VB	VC	VD	VE	VF	VG	VH	VI	VJ	VK	VL	VM	VN	VO	VP	VQ	VR	VS	VT	VU	VV	VW	VX	VY	VZ	WA	WB	WC	WD	WE	WF	WG	WH	WI	WJ	WK	WL	WM	WN	WO	WP	WQ	WR	WS	WT	WU	WV	WW	WX	WY	WZ	XA	XB	XC	XD	XE	XF	YG	YH	YI	YJ	YK	YL	YM	YN	YO	YP	YQ	YR	YS	YT	YU	YV	YW	YX	YY	YZ	ZA	ZB	ZC	ZD	ZE	ZF	ZG	ZH	ZI	ZJ	ZK	ZL	ZM	ZN	ZO	ZP	ZQ	ZR	ZS	ZT	ZU	ZV	ZW	ZX	ZY	ZZ	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT	BU	BV	BW	BX	BY	BZ	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CZ	DA	DB	DC	DD	DE	DF	DG	DH	DI	DJ	DK	DL	DM	DN	DO	DP	DQ	DR	DS	DT	DU	DV	DW	DX	DY	DZ	EA	EB	EC	ED	EE	EF	EG	EH	EI	EJ	EK	EL	EM	EN	EO	EP	EQ	ER	ES	ET	EU	EV	EW	EX	EY	EZ	FA	FB	FC	FD	FE	FF	FG	FH	FI	FJ	FK	FL	FM	FN	FO	FP	FQ	FR	FS	FT	FU	FV	FW	FX	FY	FZ	GA	GB	GC	GD	GE	GF	GG	GH	GI	GJ	GK	GL	GM	GN	GO	GP	GQ	GR	GS	GT	GU	GV	GW	GX	GY	GZ	HA	HB	HC	HD	HE	HF	HG	HH	HI	HJ	HK	HL	HM	HN	HO	HP	HQ	HR	HS	HT	HU	HV	HW	HX	HY	HZ	IA	IB	IC	ID	IE	IF	IG	IH	II	IJ	IK	IL	IM	IN	IO	IP	IQ	IR	IS	IT	IU	IV	IW	IX	IY	IZ	JA	JB	JC	JD	JE	JF	JG	JH	JI	IJ	JK	KL	KM	KN	KO	KP	KQ	KR	KS	KT	KU	KV	KW	KX	KY	KZ	LA	LB	LC	LD	LE	LF	LG	LH	LI	LJ	LK	LM	LN	LO	LP	LQ	LR	LS	LT	LU	LV	LW	LX	LY	LZ	MA	MB	MC	MD	ME	MF	MG	MH	MI	MJ	MK	ML	MM	MN	MO	MP	MQ	MR	MS	MT	MU	MV	MW	MX	MY	MZ	NA	NB	NC	ND	NE	NF	NG	NH	NI	NJ	NK	NL	NM	NN	NO	NP	NQ	NR	NS	NT	NU	NV	NW	NX	NY	NZ	OA	OB	OC	OD	OE	OF	OG	OH	OI	OJ	OK	OL	OM	ON	OO	OP	OQ	OR	OS	OT	OU	OV	OW	OX	OY	OZ	PA	PB	PC	PD	PE	PF	PG	PH	PI	PJ	PK	PL	PM	PN	PO	PP	PQ	PR	PS	PT	PU	PV	PW	PX	PY	PZ	QA	QB	QC	QD	QE	QF	QG	QH	QI	QJ	QK	QL	QM	QN	QO	QP	QQ	QR	QS	QT	QU	QV	QW	QX	QY	QZ	RA	RB	RC	RD	RE	RF	RG	RH	RI	RJ	RK	RL	RM	RN	RO	RP	RQ	RR	RS	RT	RU	RV	RW	RX	RY	RZ	SA	SB	SC	SD	SE	SF	SG	SH	SI	SJ	SK	SL	SM	SN	SO	SP	SQ	SR	SS	ST	SU	SV	SW	SX	SY	SZ	TA	TB	TC	TD	TE	TF	TG	TH	TI	TJ	TK	TL	TM	TN	TO	TP	TQ	TR	TS	TT	TU	TV	TW	TX	TY	TZ	UA	UB	UC	UD	UE	UF	UG	UH	UI	UJ	UK	UL	UM	UN	UO	UP	UQ	UR	US	UT	UU	UV	UW	UX	UY	UZ	VA	VB	VC	VD	VE	VF	VG	VH	VI	VJ	VK	VL	VM	VN	VO	VP	VQ	VR	VS	VT	VU	VV	VW	VX	VY	VZ	WA	WB	WC	WD	WE	WF	WG	WH	WI	WJ	WK	WL	WM	WN	WO	WP	WQ	WR	WS	WT	WU	WV	WW	WX	WY	WZ	XA	XB	XC	XD	XE	XF	YG	YH	YI	YJ	YK	YL	YM	YN	YO	YP	YQ	YR	YS	YT	YU	YV	YW	YX	YY	YZ	ZA	ZB	ZC	ZD	ZE	ZF	ZG	ZH	ZI	ZJ	ZK	ZL	ZM	ZN	ZO	ZP	ZQ	ZR	ZS	ZT	ZU	ZV	ZW	ZX	ZY	ZZ	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT	BU	BV	BW	BX	BY	BZ	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CZ	DA	DB	DC	DD	DE	DF	DG	DH	DI	DJ	DK	DL	DM	DN	DO	DP	DQ	DR	DS	DT	DU	DV	DW	DX	DY	DZ	EA	EB	EC	ED	EE	EF	EG	EH	EI	EJ	EK	EL	EM	EN	EO	EP	EQ	ER	ES	ET	EU	EV	EW
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15 MAY 1958

TABLE 10

CREW AND CRIME TRIAL NO. 10

Test Subject	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
Height (in.)	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69
Weight (lb.)	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175
Uniform No.	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100
Contamination Density (g./sq.m.)	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100
Particle Size (μ, 50%)	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120
Traversal Time (min. - sec.)	3-30	3-30	3-30	3-30	3-30	3-30	3-30	3-30	3-30	3-30	3-30	3-30	3-30	3-30	3-30	3-30	3-30	3-30	3-30

Location of Pick-up

Simulant Picked up (mg.) on Various Sections of Uniforms

Jacket	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
Chest, left	38	112	112	112	112	112	112	112	112	112	112	112	112	112	112	112	112	112	112
Chest, right	26	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
Upper Abdomen, left	73	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98
Upper Abdomen, right	42	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26
Upper Arm, left	10	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47
Upper Arm, right	3	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24
Elbow, left	88	217	217	217	217	217	217	217	217	217	217	217	217	217	217	217	217	217	217
Elbow, right	11	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Forearm, left	24	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108
Forearm, right	22	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44
Trousers																			
Lower Abdomen, left	38	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93
Lower Abdomen, right	32	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
Right, left	28	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52
Right, right	38	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45
Knee, left	64	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66
Knee, right	122	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
Lower Leg, left	59	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
Lower Leg, right	0	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26
Slaves																			
Left	71	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127
Right	115	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139
Wise Flowers																			
Right	6	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Underwear																			
Cuff, left	54	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17
Cuff, right		193	193	193	193	193	193	193	193	193	193	193	193	193	193	193	193	193	193
Elbow																			
Skin																			
TOTAL	853	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104
Pick-up Factors*	1.176	1.177	1.176	1.176	1.176	1.176	1.176	1.176	1.176	1.176	1.176	1.176	1.176	1.176	1.176	1.176	1.176	1.176	1.176

REMARKS:

NOTE: Trial was performed on damp terrain.

*Pick-up factor equals percent of the ground contamination picked up on the uniform as a factor of traversal.

CONFIDENTIAL

2

Jackman

Chest, left	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Chest, right	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Upper abdomen, left	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Upper abdomen, right	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Upper arm, left	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Upper arm, right	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Elbow, left	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Elbow, right	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Forearm, left	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Forearm, right	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Trousers	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Lower abdomen, left	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Lower abdomen, right	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Thigh, left	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Thigh, right	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Knee, left	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Knee, right	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Ankle, left	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Ankle, right	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Lower leg, left	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Lower leg, right	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Glances	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100

*Total quantity of clothing picked up on jacket, in case, in case.

REMARKS:

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1. $\frac{1}{2} \log \frac{1}{2} = -0.1532$

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1900	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100
1900	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100

21. 2

Year	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100
1971	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100

4

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Total quantity of effluent picked in one batch, 200000, and given.

*Plexip factor available at the ground concentration indicated on the uniform indicator of traversal.

Mickelson v. A. in Ex-og-willor Trale

Mickelson v. A. in Ex-og-willor Irple



A total quantity of stainless steel used on breast, trousers, and gloves, multiplied by factor 0.4, gave personal steel ground contamination (in $\mu\text{Ci/g}$) due to the influence of factor 0.4 (the real).

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APPENDIX A

Table 13

Cooperative Pick Up on Roller and Man

Date	Test subject	Contamination density	Approx particle size	Pick-Up		
				Roller	Man	Roller/Man
19 Jun 58	A	2/84 μ 10.5	Large	3.61	3.30	1.08
19 Jun 58	A	6.95	Large	2.66	2.31	1.15
19 Jun 58	A	9.42	Large	3.85	2.84	1.36
19 Jun 58	A	2.90	Large	0.94	0.77	1.22
19 Jun 58	A	0.72	Large	0.49	0.39	1.25
19 Jun 58	A	1.44	Small	0.94	0.40	2.04
19 Jun 58	A	3.11	Small	1.20	0.99	1.21
19 Jun 58	A	5.29	Small	1.41	1.07	0.77
19 Jun 58	A	7.70	Small	3.93	2.69	1.46
19 Jun 58	A	10.4	Small	4.40	3.41	1.17
14 Apr 58	E	2.13	1100	1.90	1.47	1.29
14 Apr 58	A	2.43	1000	1.07	1.37	1.05
14 Apr 58	A	2.08	700	1.48	1.46	1.01
17 Apr 58	D	12.1	2500	6.48	5.06	1.28
17 Apr 58	I	9.85	2500	5.00	3.43	1.46
17 Apr 58	R	8.00	2500	3.82	3.30	1.14
15 May 58	H	1.45	700	1.09	0.85	1.28
15 May 58	G	0.81	3100	0.80	0.57	1.40
15 May 58	E	1.62	3100	1.45	1.01	1.44
28 May 58	G	0.90	600	1.24	0.77	1.61
28 May 58	H	2.53	600	3.08	2.82	1.09
28 May 58	A	0.21	600	1.32	0.63	2.09

Remarks:

1. Trials conducted on 19 Jun 58 were run in accordance with Test Plan No. 29. The other data presented were obtained in conjunction with "creep and crawl" trials.
2. Physical characteristics of test subjects appear in preceding tables.

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APPENDIX A

Table 14

Comparative Transferability of Agent and Simulant

Trial No.	Contamination density g/sq m	Particle size	Roller Pick-Up				
			First Traversal			Second Traversal	
			Top cloth	Under cloth	Ratio agent/sim*	Top cloth	Under cloth
			mg	mg		mg	mg
1	8.5	Small	2,440	23	0.68	27	1
2	13.9	Small	2,390	43	0.41	80	2
3	6.9	Small	2,530	40	0.89	17	2
4	3.6	Small	1,270	52	0.85	16	1
5	2.2	Small	250	25	0.29	10	1
6	10.0	Large	2,000	7	0.53	76	54
7	12.9	Large	1,300	23	0.25	60	59
8	8.2	Large	1,250	2	0.40	47	23
9	3.4	Large	1,100	15	0.85	18	11
10	1.0	Large	520	16	1.34	7	5

Remarks:

*In establishing the ratio of agent to simulant pick-up, corresponding values of simulant pick-up were obtained from curves in figure 3, appendix B, which were fitted to data obtained on 10 June 1953 as presented in table 13, this appendix.

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APPENDIX B

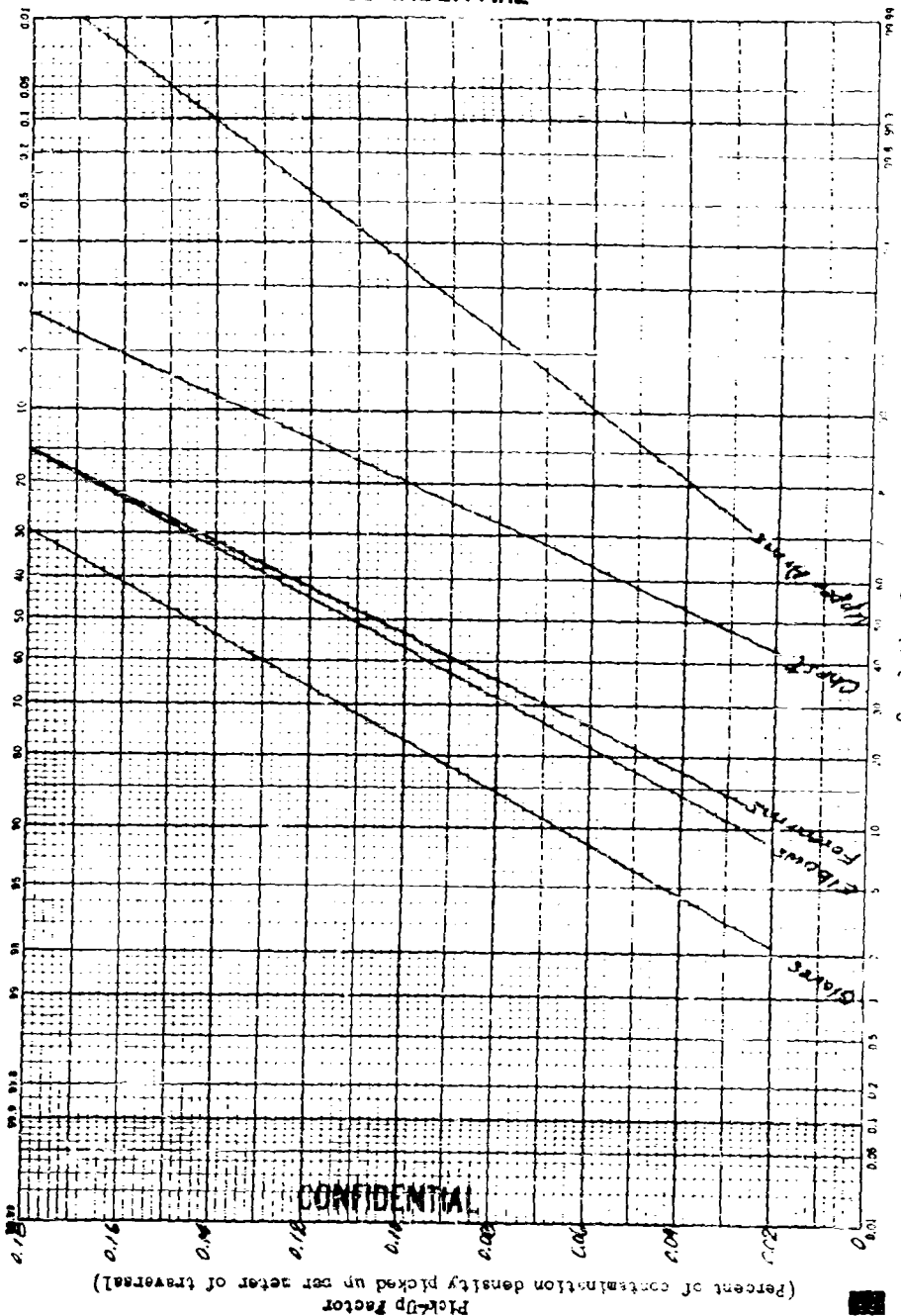
GRAPHS AND CHARTS

	Page
Figure 1 Distribution of Simulant on Uniforms of Test Subjects.	28
Figure 2 Distribution of Simulant on Uniforms of Test Subjects.	29
Figure 3 Pick-Up of Simulant on Cloth-Covered Roller.	30
Figure 4 Comparative Transferability of Agent and Simulant.	31

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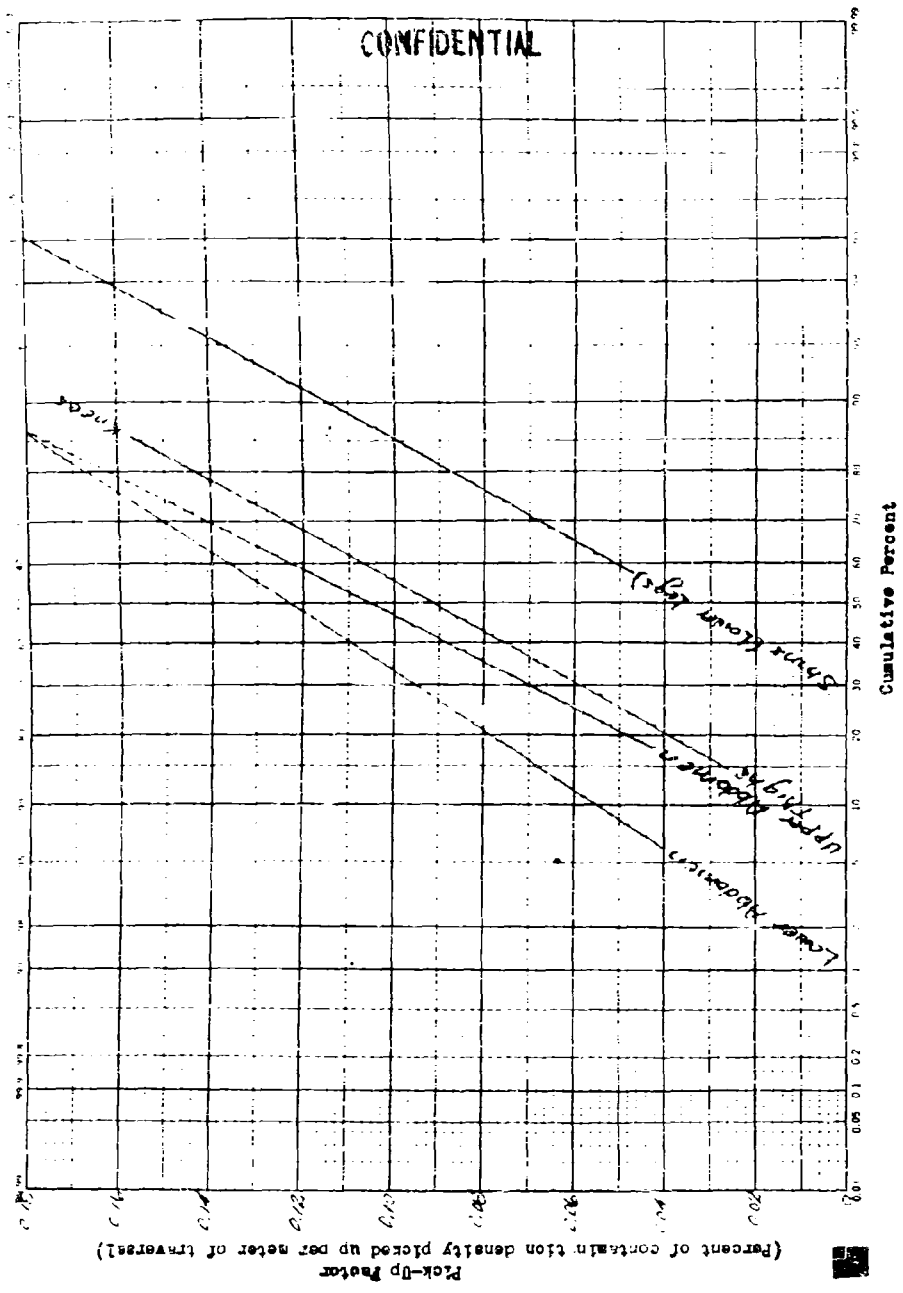
FIGURE 1
DISTRIBUTION OF SIMULANT ON UNIFORMS OF TEST SUBJECTS



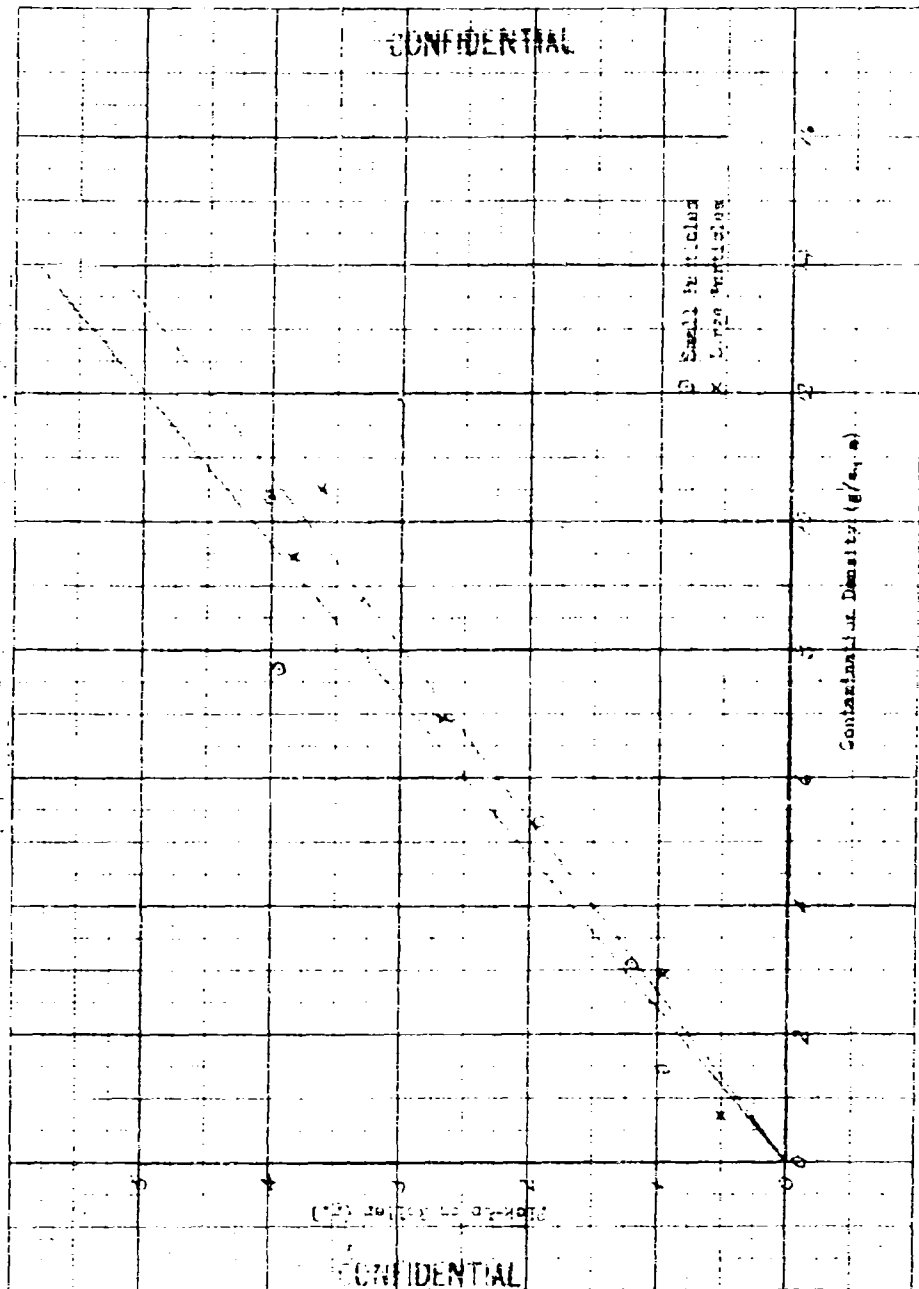
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K&E DIVISION
NEUPPEL H. SEER CO. NEWARK, N.J.

FIGURE 2

FIGURE 2
DISTRIBUTION OF SIMULANT ON UNIFORMS OF TEST SUBJECT



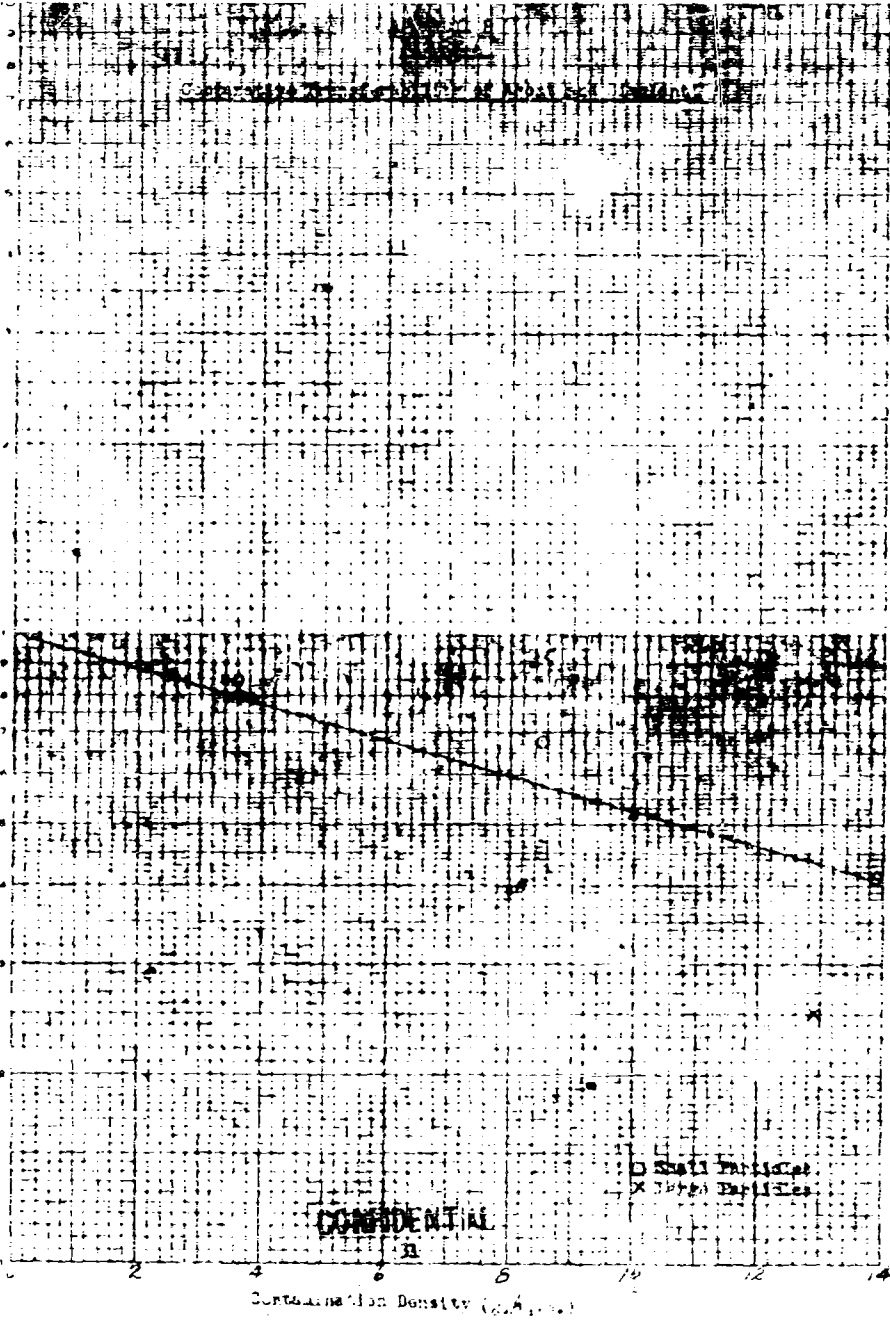
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Figure 1 - Effect of Contamination Density



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APPENDIX C

PHOTOGRAPHS

	Page
Figure 1 Spinning Tip apparatus.	33
Figure 2 Multijet Disperser.	34
Figure 3 Nozzles for Multijet Disperser.	35
Figure 4 Cloth-Covered Roller.	36
Figure 5 Contaminated Uniform (Light).	37
Figure 6 Contaminated Uniform (Medium).	38
Figure 7 Contaminated Uniform (Heavy).	39

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FIGURE 1

SPINNING TIP APPARATUS

View shows sled-mounted spinning tip apparatus employed in dispersing simulant in fine droplets.

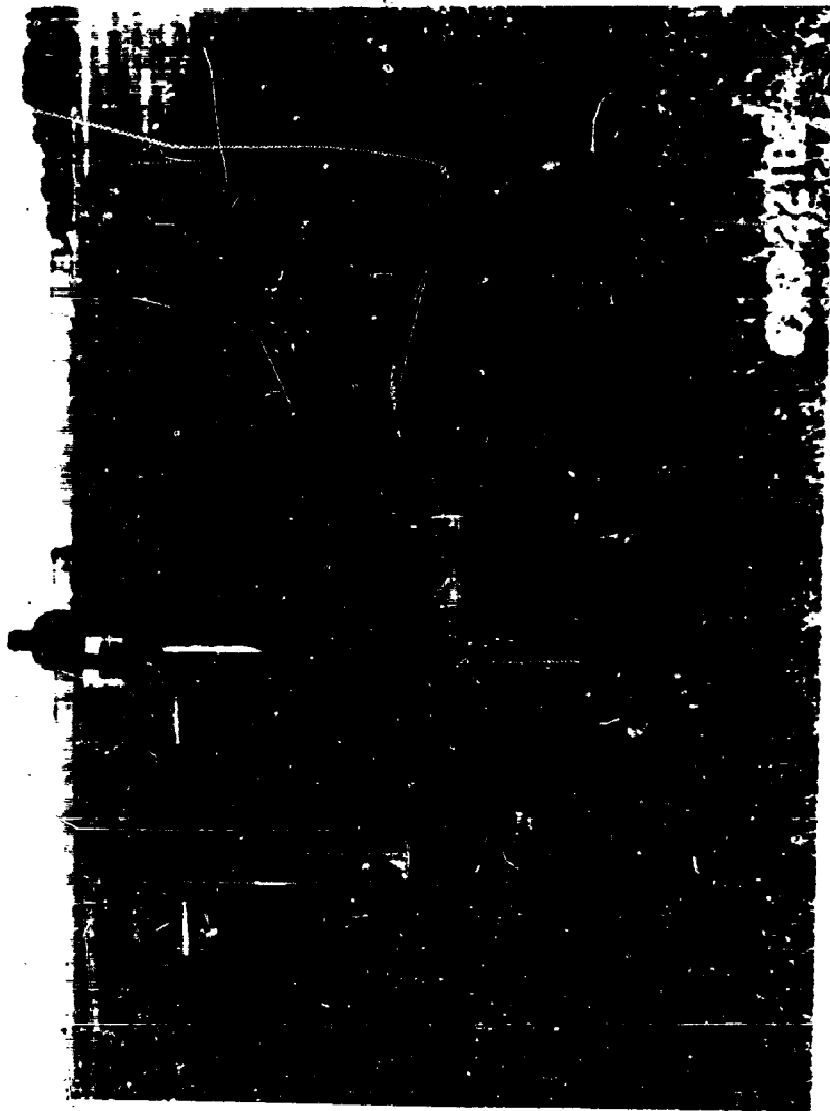


FIGURE 2

MULTIJET DISPENSER

View shows sled-mounted multijet dispenser employed in the dissemination of large droplets. The sled for the spinning the generator is seen in the background.

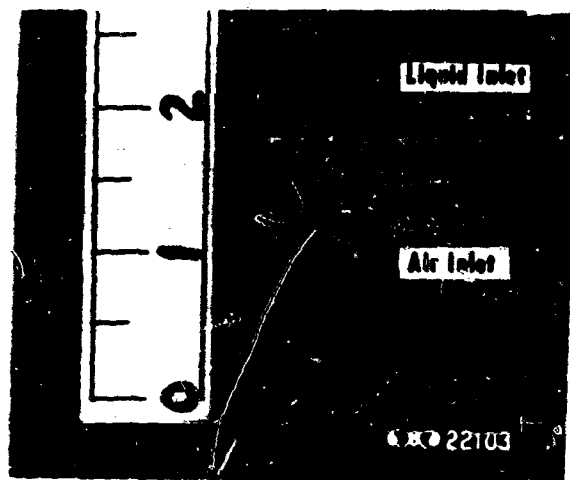
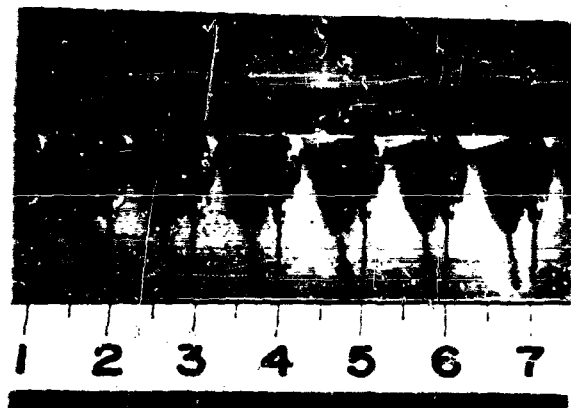


FIGURE 1

NOZZLES FOR MULTI-JET DISPERSER

Top view shows a section of the disperser manifold with needles for disseminating 3 μ droplets. Bottom view shows nozzles for disseminating shattered droplets averaging less than 0.5 μ in diameter.

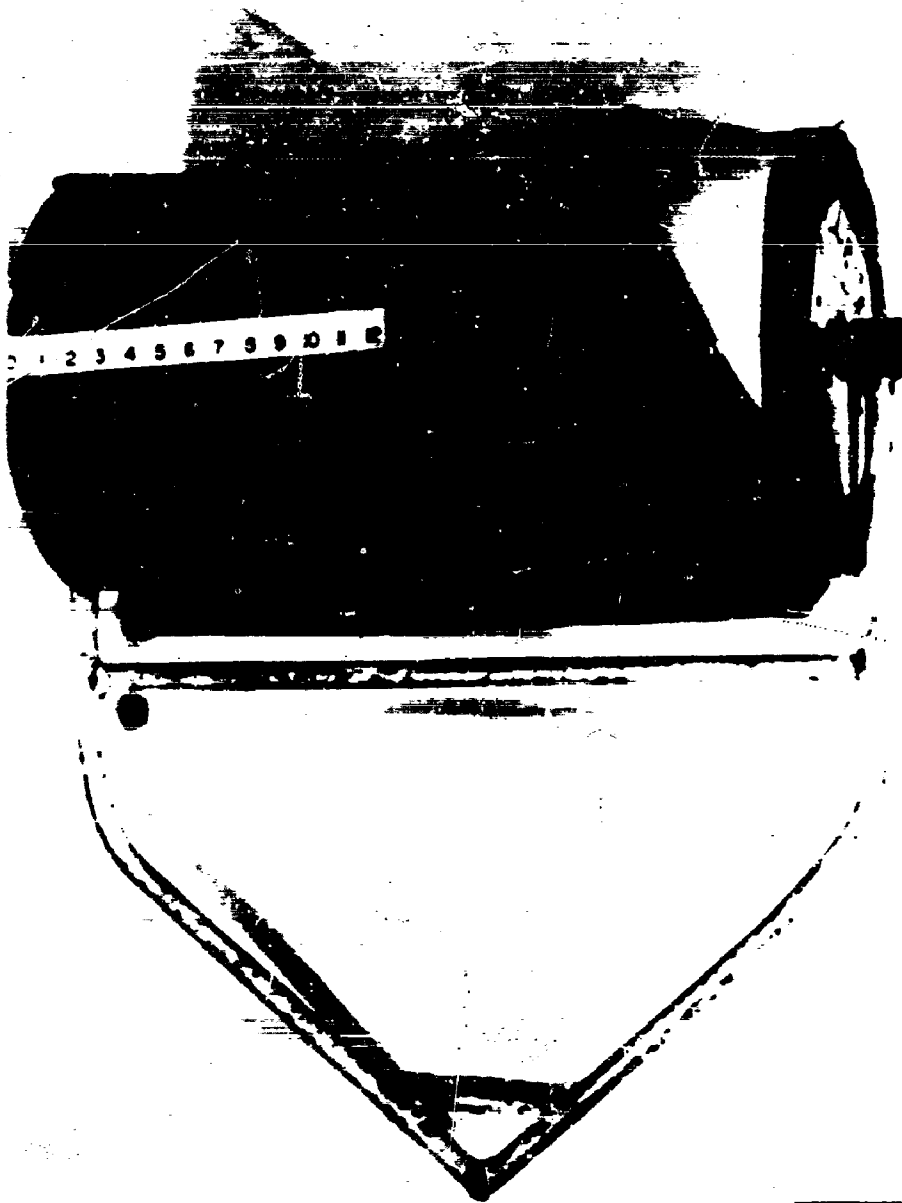


FIGURE 4

CLOTH-COVERED ROLLER

In this view the cotton sateen cover is lifted to show the 1/2-in. thick foam rubber pad covering the steel drum of the roller.



FIGURE 5
CONTAMINATED JACKET (LIGHT)



FIGURE 6
CONTAMINATE UNIFORM (SEDITH)

View shows contaminated clothing mounted on a plane surface after seams were cut.

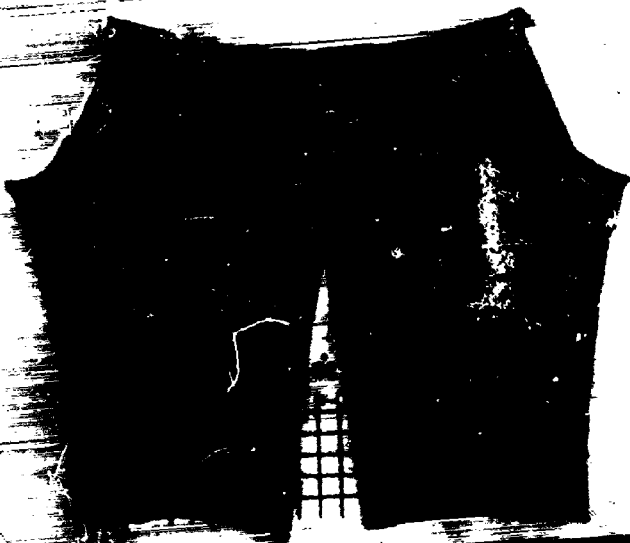


FIGURE 7

CONTAMINATED (HEAVY)

View shows contaminated clothing material on a white surface after being worn out.

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