

Reproduced by

AIR DOCUMENTATION

HEADQUARTERS AIR MATERIAL COMMAND

the

U.S. GOVERNMENT

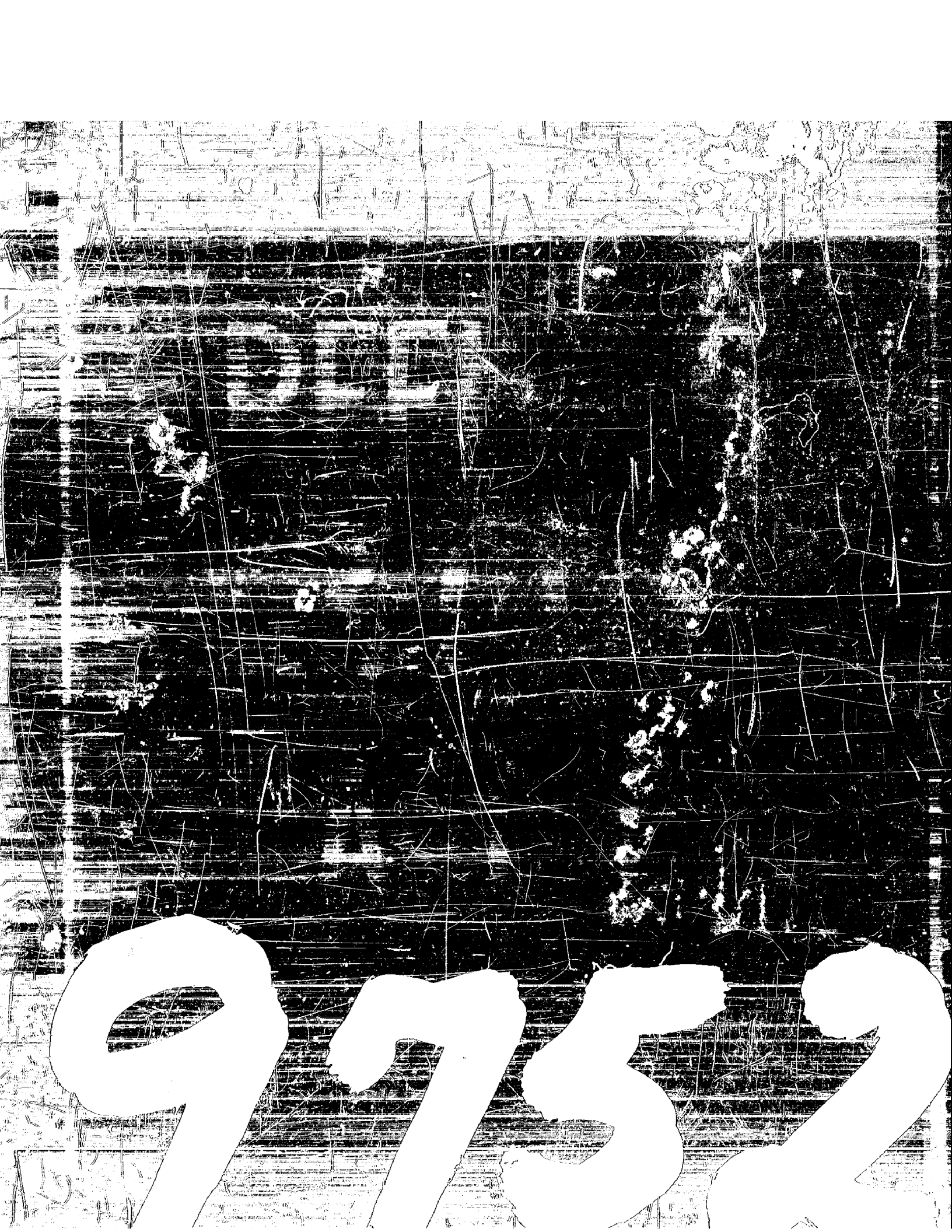
IS ABSOLVED

FROM ANY LITIGATION WHICH MAY

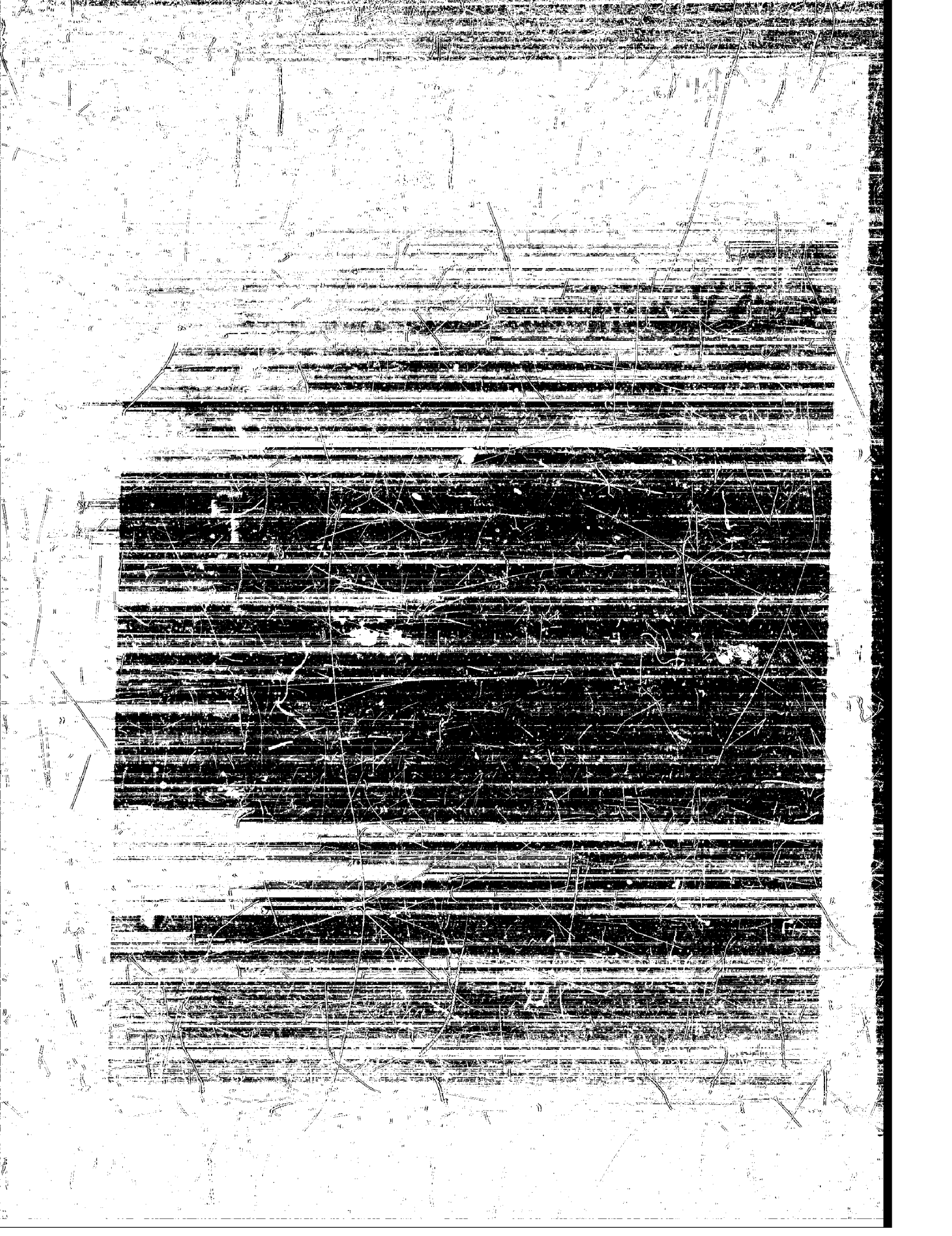
ENSUE FROM THE CONTRACTORS

FRINGING ON THE FOREIGN PATENT

RIGHTS WHICH MAY BE INVOLVED.



9752



G-3060

R. P. G. Report
No. 107
of July, 1955.

ASSOCIATE COMMITTEE ON AVIATION MEDICAL RESEARCH

from

SUBCOMMITTEE ON PROTECTIVE CLOTHING

SUBJECT: Review of the work of the Subcommittee
on Protective Clothing (1949-55),
Associate Committee on Aviation Medical
Research, National Research Council,
Canada.

AUTHORS: E. J. Vining
E. Page

Working at the Banting and Best Department of
Medical Research, University of Toronto, under a
grant from the National Research Council of Canada.

TABLE OF CONTENTS

	<u>Page</u>
SUMMARY	I - VII
 ORGANIZATION OF THE SUBCOMMITTEE	
Origin and Terms of Reference	1
Work	1
Members and Associated Workers	2
Places of Work	3
Meetings, Minutes and Reports	4
Relations with other Committees	5
Relations with Industry	6
Service Requirements	6
Prototypes, Service Trials, Specification and Production	10
 PROPERTIES OF MATERIALS USED IN CLOTHING	
 Tests Used for the Evaluation of Fabrics	
Thermal Insulation	14
Scope and Validity of Measurements	17
General Methods of Measurement	18
Open Method vs. Two Plate Method	19
Effect of Air Movement	20
Transmission of Heat Through Fabrics	21
Insulation by Reflection	22
Effect of Thickness on Thermal Insulation	23
Thickness of Pile Fabrics	24
Index of Warmth	25
Index of Comfortability	26
Comparison of Different Types of Pile Fabrics, and Effect of Moisture	28
Tuft Binding Power of Pile Fabrics	29
Permeability of Materials to Water Vapour	30
General	31
Test Method	32
Permeability of Fabrics to Water Vapour	33
Permeability of Leather to Water Vapour	34
Water Retention and Rate of Drying of Fabrics	35
The Slipperiness of Lining Fabrics	37
Filling Materials for Life Jackets	37
Use of Kapok	37
Test of Buoyancy of Filling Materials	38
Substitutes for Kapok	39
 CLOTHING AS PHYSIOLOGICAL PROTECTION	
Historical Note	41
Thermal Insulation of Clothing	41

Table of Contents (Cont'd)

	Page
General Considerations: and effect of Air Movement	44
Effective Curvature of Body Surface	46
Effect of Altitude	46
Significance in Respect to a Clothed Man	46
Thermal Insulation of Clothing: Cold Conditions	47
The ICLO Unit	47
Insulation Needed for Comfort	49
Means of Measuring Thermal Insulation of Flying Suits	49
Effects of Inadequate Clothing	51
Thermal Insulation of Clothing: Warm Conditions	52
Heat Exchange	52
Heat Load Imposed by Solar Radiation	54
Criteria of Heat Stress	54
Distribution of Moisture in Clothing	55
Compression Loads in Flying Clothing	57
ARTICLES OF EQUIPMENT	
Flying Helmets	57
Historical Note	57
Flying Goggles	60
Winter Flying Suits	65
Historical Note	65
Windbreak Overall Fabrics for Winter Flying Suits	65
Thermally-insulating Fabrics for Winter Flying Suits	65
Slide Fasteners	70
Electrically-Heated Clothing	71
Historical Outline	71
General Requirements	74
Amount and Distribution of Heating	75
Automatic Control of Heating	76
Undersuits	82
Electrically Heated Undergloves	82
Electrically Heated Underboots	84
Air-Heated Undersuit	85
Description of Air-Heated Undersuit	86
Light Weight Flying Suit	88
Aircrew Suit	89
Winter Underwear	90
Skiing Hat Vests	90

	Page
Flying Gloves	89
Historical Note	89
Description of Type E Flying Gloves	91
Flying Boots	93
Life Jackets	94
Historical Note	94
Inflatable Life Jacket Type C	97
Tropical Inflatable Life Jacket	98
Flotation Jacket with Permanent Flotation Only	99
The Packing of Inflated Ploas in Flotation Jackets	99
Emergency Light	100
Flight Exposure Suits	101
Flight Exposure Suit, Type A	102
Flight Exposure Suit, Type B	103
Repair-Resistant Plastic-Coated Fabric	104
Uniforms for Aircrew	105
Clothing for Ground Wear	106
Airmen's Mills	106
Special Cold Weather Clothing	108
Camouflage Suits	107
Marine Crew Clothing	107
Emergency Kits	108
Film on Survival in Emergency	113
Conspicuous Colours	114
Casualty Bag	114
Ditching Suits	115
Introduction	115
Development	117
The Thermal Insulation of an Inflatable Emergency Exposure Suit, Designed by Canadian Leader Park, R.A.F.	120
Containers for Survival	121
Mixation of Fresh Water with Sea Water for Castaways	121
Miscellaneous	122
Equipment for Pressurised Breathing	123
Origin of Development	123
Circulatory Effects	124
Work Carried out in the United Kingdom	126
Work Carried out in Canada	128
Film on Pressurised Breathing	129
Conferences and Liaison on Pressurised Breathing	129

REFERENCE TO REPORTS OF THE ASSOCIATE COMMITTEE ON
AVIATION MEDICAL RESEARCH AND OF ITS SUBCOMMITTEE ON
PROTECTIVE CLOTHING

REFERENCE TO EXTERNAL LITERATURE

5-3038

28 July, 1945.

REPORT

to

ASSOCIATE COMMITTEE ON AVIATION MEDICAL RESEARCH

from

SUBCOMMITTEE ON PROTECTIVE CLOTHING.

Subject: Review of the work of the Subcommittee on
Protective Clothing (1942-45), Associate
Committee on Aviation Medical Research,
National Research Council, Canada.

Authors: J.A. Kitching and B. Page.

SUMMARY

Purpose:

The purpose of this report is to describe briefly and to review the work of the Subcommittee on Protective Clothing, in order that a historical record may be available of the Subcommittee's work, and that its contributions of the Subcommittee may be made readily available to military and other national services, to whom the design of special protective clothing is of concern, and that the lessons learnt through the experiences of the Subcommittee as to the organization of this kind of work may not be forgotten.

Scope:

This report covers the origin, organization, and work of the Subcommittee on Protective Clothing, and other work begun shortly before the formation of the Subcommittee.

(a) Organization Until the beginning of 1942, work on protective clothing on behalf of the C.I.P. was carried out primarily at R.C. A.P. Headquarters, the Air Force and East Department of Medical Research of the University of Toronto, and at No. 1 Clinical Investigation

The Subcommittee on Protective Clothing was formed in January, 1942, as a Sub-committee of the Associated Committee on Aviation Research, to coordinate work in this field, and shortly afterwards under its auspices the work was transferred to the Ontario Research Foundation and the Research Council Laboratories. The Subcommittee contained civilian and Air Force members, representing the various organizations participating in

During the period 1942 to 1945, the Subcommittee on Protective Clothing undertook investigations of fundamental problems connected with clothing in the sphere of textiles and physiology, it undertook projects at the request of the Flying Clothing Committee and Dress and Clothing Committee, for the development of equipment for use in the R.C.A.F. in Canada (both in training and in operational commands), and it published a monograph on "Aviation Medical Clothing". The Subcommittee also held a series of conferences at the disposal of the various interested scientific bodies and of the various military departments.

The Subcommittee on Protective Clothing held thirty meetings during the period in question, in Ottawa and in Toronto. Guests attended from suitably accredited civilian institutions and military services. Minutes were prepared in which were specified the actions assigned to the various members and the continuation of the work. A high degree of cooperation was established and to this may be attributed much of the success that was achieved. Reports submitted to the Subcommittee were considered extremely valuable, and were used as far as necessary, in order that the service committees for which the work was undertaken might be assured of reliable and authoritative advice.

During the course of the work many materials were tested in order that their suitability for incorporation into articles of clothing or other equipment might be determined. These tests were carried out at the Research Council Laboratories and at the Ontario Research Foundation. A library of fabrics was maintained, in which were deposited samples of all those fabrics and the results of the tests carried out on them.

The experience of the Subcommittee confirmed the importance of a knowledge of the service requirements and conditions for which an article of equipment was required. Lack of knowledge led to failures and waste of time in certain cases, while proper access to these conditions resulted in progress in other cases. This matter is of the greatest importance in the development of military equipment.

Properties of Fabrics and Other Materials.

A series of tests was established for the assessment of fabrics. Although most of these were well recognized tests, certain important new tests had to be developed. It was confirmed that for the less dense fabrics the thermal insulation of fabrics is proportional to the thickness. This applies both to a single fabric under various conditions, and in the comparison of various different fabrics, provided the bulk density is low. In the case of fabrics through a fabric, the part played by conduction across the fibres was shown to be very small, nor was radiation considered a significant factor in view of the very large number of subdivisions of space offered by the fibres.

In view of the fact that the thermal insulation depends on thickness, an extensive investigation was made of the effect of pile fabrics and of their ability to retain their thickness under conditions of repeated compression and relaxation. A test was developed by which it was possible to make an estimate of the effective thickness of a pile fabric, due account being taken of the repeated compressions which would be experienced in service. After a comparative examination of many types of pile fabrics, made from wool, cotton, rayon, and synthetic materials, it was concluded that a double pile fabric made of wool was the best, although the possibility remained that the addition of mohair might be beneficial. The wool double pile fabric was improved in respect of lightness and pliability by reduction of the number of tufts per inch in the ground to the minimum necessary to hold the pile. A test specially developed for this purpose indicated that the tuft binding power, though reduced, was still adequate.

A test method was developed by which for the first time it was possible to determine in common physical units the permeability of a fabric to air. By means of air the actual multiple exposure to which the air spaces between the layers of the fabric are subjected, and the number of layers of fabric, were each varied in a controlled way. It was found possible to determine independently the resistance offered by the air space below the fabric, the fabric, and the air above the fabric. The results proved important in the design of tropical clothing and of flight exposure suits, and formed a basis for the study of the distribution of moisture in clothing. The test method was also applied to leather, and proved valuable in the interpretation of field tests on boots conducted by the Canadian Army.

In view of the loss to the Japanese of stores of wool, now as it does for life jackets, a study was made of possible substitutes. An attempt to make cotton

or wool buoyant by treatment with a water-repellent substance proved unsuccessful. It was shown that the use of wool, even more readily on agitation than dry kapok, although under still conditions it gave good results. It was concluded that wool and cotton lack some property necessary for buoyant materials for life jackets. This property is probably the maintenance of rigidity under humid conditions. Milkweed fibres were found to maintain excellent buoyancy even when investigated, and its use for life jackets was recommended.

Physiological Aspects of Clothing. In the early part of the war it was recognized that protection against cold would be one of the most important problems in the design of clothing. Accordingly, a physiological method was developed by which the thermal insulation of clothing could be estimated from a consideration of the heat production, skin temperature, and loss of body heat of a subject standing in the clothing in question under cold conditions. The results were corroborated by tests carried out with an 'artificial man' containing an electric heater, and a fan to circulate the air inside it. The amount of electricity needed over a given period of time to maintain the body temperature was used to determine the insulation of the clothing worn. In all this work an attempt was made to determine the insulation of the clothing in the tropics. The results were very different from those obtained in the temperate zone. The thermal insulation was expressed in a new unit, the 'tropical thermal unit', which was physiologically equivalent to the 'thermal unit' used in the temperate zone. The results were also used to determine the needs of electrical heating under various conditions, and the exchange of heat under tropical conditions and under direct solar radiation.

An investigation was made of the distribution of moisture in the body. The results were obtained from various layers of the subject's clothing, and from the skin. The temperature of the various layers was measured, and from this the humidity was estimated, and from this and the temperature the vapour pressure is equal to that of the air was deduced. The results are in agreement with theoretical expectations.

Equipment Developed. The first project completed for the R.C.A.F. was the recommendation of shape and construction of an aircrew suit of battlesuit style; this was accepted. A new design of flying glove, having fingers curved in the natural position of the hand at rest, was also accepted without delay and rapidly

produced and issued by the R.C.A.F. This was followed
by the development of a flying suit later immediately accepted
3) incorporating the double pile fabrics and constructed
with the knees and elbows bent to suit a sitting man.
An extensive programme of work for the improvement of this
type of flying suit and its components was undertaken.
This included the investigation of windbreak covering
fabrics, with recommendation of a light material of high
quality. The survey of the properties and weaknesses of
slide fasteners, with completion of a specification of
requirements, the investigation of double pile fabrics of
many types, the development of an alternative lining fabric,
the improvement of many features of style and construction,
and the assessment of the reaction of aircrew to this suit
by analysis of the results of a questionnaire.

out for the R.C.A.F. An electrically heated electric suit
took the form of a lining worn as a separate suit under
the flying suit. Two types were developed, one controlled by
thermostats and the other controlled by a single
master regulator of novel design placed in the hand.
Electrically heated undershirts and undersocks were also
specially developed. The second type of suit was accepted
by the R.C.A.F. and produced for use by bomber reconnaissance
crews.

An air heated undersuit was also developed,
specially for use in the form of a separate suit worn
as a lining. This article did not receive any great en-
couragement and was never given service trials by the
R.C.A.F. but was later tested for use in the R.C.N.

The development of a new type of jacket was under-
taken by the R.C.A.F. although no flying suit was
submitted as to service requirements. Both an inflatable
jacket and a jacket having permanent insulation were
developed. The inflatable jacket was found in service trials to be very
acceptable to aircrew, and was accepted by the R.C.A.F.
Flying Clothing Committee as the general type desired.
However, the project was then removed from the Subcommittee
by the R.C.A.F. without explanation. It appears that no
definite policy as to service requirements was attained.
The jacket with permanent insulation was further modified
by the R.C.A.F. and issued by them in large numbers for
operational use. The automatically flashing light
incorporated in cooperation with the R.C.A.F. and having a
brighter flash and longer life than any other light of
similar size, was also issued in quantity by the R.C.N.

It was purchased in small quantities by the R.C.A.F. but appears never to have been issued. Some of these were used on a limited scale and for a special purpose by the R.C.F. and are known to have proved valuable.

Development of a new flying boot free of rubber was initiated soon after the loss of rubber-producing areas to the Japanese. Service requirements remained in effect for some time, and the boots eventually produced never received service trials. They would admittedly be expensive to manufacture.

A new flying goggle was developed, having very wide field of vision, with the transparent components all in one position and made of plastic. This goggle was produced and issued by the R.C.A.F. but was subsequently abandoned in favour of a substantially similar goggle of improved design first produced in the United States.

A type of leather flying helmet was developed which was much more comfortable than the original R.C.F. issue, and which, in various modifications, provided a good exclusion of external noise. A mesh helmet was also developed of similar type, and this was adopted by the R.C.A.F. and has become the regular helmet used in Canada.

An improved knitted underwear fabric was developed for aircrew use, but was not adopted by the R.C.F. It was clear that flying personnel were reluctant to change their underwear before a flight and would not be able to wear winter underwear in a heated aircraft.

The development of a 'flight exposure suit' was undertaken in January, 1944. This suit was intended for continuous wear during flight, and was to be capable of keeping out water from the underlying clothing in the event of immersion such as might arise at low-level operations or from falling into the sea. It was therefore considered necessary for the suit to exclude water and yet to permit the evaporation of sweat during flight. The first type was designed with a drawstring neck-closure. The upper half of the suit was made of a special fabric (of a type designed in 1941) which permitted the passage of water vapour while being fairly impermeable to water. Sufficient samples for service trials were available by August, 1944. Completion of the trials in February, 1945, led to an improved type of suit, with front closure by means of a drawstring fastener, was completed within a further month. The R.C.A.F. valuable cooperation was received from the U.S. National Research Council throughout this work.

... 1943 ... These included a tropical uniform, cap, and boots. Tests were also carried out on an air conditioning belt fitted with a small blower. Even under these hot conditions imitative of aircraft parked in the sun, the circulation of environmental air with the clothing proved helpful provided that the shirt was first wetted to provide water for evaporation.

A very extensive programme was carried through for the development of emergency kits for aircrow in case of a forced abandonment of aircraft. A personal kit was developed very rapidly incorporating rations, medical aids, and other special emergency aids. All packed in a bandolier for wear by each member of aircrow. This development was followed by an aircraft kit of much larger size, which would be available in case of a forced landing, and of a sleeping bag kit, containing also extra clothing suitable for use in the bush in winter. Assistance was also given in connection with gingly kits. All these kits were put into production and issued by the R.C.A.F. in the shortest possible time.

A special casualty bag was developed for the transport of wounded by air. This bag received very favourable comment in service trials, but has so far not been adopted. A solution was also found to the problem of protecting the distilled water in serum administration kits from freezing under cold conditions.

In October, 1943, an urgent request was received for the development of a waterproof ditching suit to be donned on 'ditching' as a protection against immersion and exposure. Prototypes were developed and were given sea trials off Halifax in November, 1943. The R.C.A.F. undertook production of the ditching suit (with certain modifications) and issued it to bomber reconnaissance aircraft on Atlantic patrols.

Research on the physiology of pressurized breathing and on the development of equipment for pressurized breathing for raising the physiological ceiling of fliers was carried out in conjunction with the Subcommittees on Oxygen and Intercommunication Equipment (National Research Council). Completion of the project was carried out by representatives of the National Research Council at the R.A.F. Physiological Laboratory, Farnborough, England. This equipment was accepted by the R.C.A.F. and was used on high altitude photographic reconnaissance operations over Europe. A film entitled "Boost Your Breathing" was produced which explained the theory and use of pressurized breathing. This film was shown in England to medical officers and flying personnel concerned.

ORGANIZATION OF THE SUBCOMMITTEE

Mission and Terms of Reference

The Subcommittee on Protective Clothing was formed as a Subcommittee of the Associate Committee on Aviation Medical Research of the National Research Council, Ottawa, in February, 1942. The terms of reference (12th Executive Meeting of the Associate Committee on Aviation Medical Research) were as follows:

1. To co-ordinate existing work sponsored by the Associate Committee in relation to clothing;
2. To study the physical characteristics of available materials and all possible substitutes (fabrics, leather, rubber and plastic goods), and to determine the suitability of such materials or substitutes in clothing from a physiological and medical point of view;
3. The formation of a fabric library, listing materials according to their proper availability;
4. To carry out research, development tests, etc., on all articles of clothing, if requested by the R.C.A.F. Flying Clothing Committee or the Dress and Clothing Committee;
5. To report to the National Research Council and R.C.A.F. on the research, development, and testing of protective clothing.

The Subcommittee on Protective Clothing was a means whereby problems of the R.C.A.F. in protective clothing (including a wide range of personal equipment) could be presented as clearly as possible by responsible air force officers to the investigators who were to attempt their solution, whereby the members of the Subcommittee could be discussed and criticized, and whereby the solutions obtained could be made known to the administrative officers concerned. In the Subcommittee, service and civilian research workers met officers from R.C.A.F. Headquarters (Ottawa), whose duty it was to advise the service or to make administrative decisions regarding the provisioning of personal equipment for use in Canada in the light of operational requirements.

The work of the Subcommittee consisted in the investigation of fundamental physiological and textile problems with a view to service application, and in the design and testing of articles of protective personal equipment for the air force. It was the particular function of the Subcommittee to present to the R.C.A.F. in Canada the information and the designs obtained by its efforts in an

pressure, so that executive decisions to be made by the Air Force regarding personal equipment could be securely founded.

The developments and the results of investigations conducted by the Subcommittee were made available to other interested allied services and in many cases investigations of widespread application were carried out. There was unfortunately no special connection with the I.C.A.P. overseas, except such as might be established temporarily by personal contacts and visits.

Members and Associated Others

The membership of the Subcommittee is given in Table 1.

TABLE 1

<u>Name</u>	<u>Representation</u>	<u>Period of Service</u>	<u>Address</u>
G. E. Hall, C/M	Chairman	February 1942 - June 1945	National Research Council Headquarters, Ottawa
H. C. Barrett		Feb. 1942 - July 1945	Dept. of Medical Res. University of Toronto
A. G. Burton		Feb. 1942 - June 1945	Dept. of Medical Res. University of Toronto
Chairman, Committee on Aviation Medicine	P. Graham	October 1942 - June 1945	No. 1 Clinical Investig. Unit, Toronto, RCAF
C. E. Gault, S/D		March 1942 - June 1945	Ontario Research Foundation
P. Larose		March 1942 - June 1945	National Research Council Laboratories
R. C. A. P. Civilian Liaison Officer	P. W. Webb, W/C	Feb. 1942 - Jan. 1944	R.C.A.P. Headquarters Ottawa
	J. MacCott	Feb. 1944 - June 1945	
A. Ferguson, W/C		October 1943 - June 1945	No. 1 Clinical Investig. Unit, Toronto, RCAF

Continued

NAME	Organization and Dates of Employment	Place of work for
Directorate of Aeronautical Engineering	W. J. Cunningham, S/L April 1942 - May, 1944	R.C.A.F. Headquarters Ottawa
Directorate of Aeronautical Engineering	W. J. Cunningham, S/L Nov. 1942 - July 1944	R.C.A.F. Headquarters, Ottawa
Directorate of Aeronautical Engineering	N. F. Huch, S/L Sept. 1944 - June 1945	
Directorate of Operational Requirements	M. M. Foss, W/C Oct 1943 - May 1944	R.C.A.F. Headquarters, Ottawa
	G. P. Stevens, S/L July 1944 - June 1945	
	A. J. Rothschild, S/L Nov. 1944 - June 1945	
	G. R. Harland, P/L Feb 1945 - June 1945	
R.C.A.F. No. 1 Clinical Investigation Unit, Medical Officer in Charge	A. C. Coles, W/C June 1942 - April 1944	No. 1 Clinical Investigation Unit, Toronto
	G. B. Stewart, W/C May 1944 - June 1945	
	J. K. W. Ferguson, S/C June 1945	
A. F. Foss	Nov. 1942 - Sept. 1944	Department of Medical Research, University of Toronto.
H. G. Williams, S/L		Department of Medical Research, University of Toronto.
J. A. Hitching, Secretary	Feb. 1942 - June 1945	Department of Medical Research, University of Toronto.

The following were appointed as corresponding members for the period (May, 1944 to January 1945) during which they were posted to the United Kingdom, in order that the results of their observations might be available.

A list of those who have assisted in the investigations of the Subcommittee, together with particulars as to their civil occupations before the war, is given in the Appendix. A large number of the workers were university teachers or research workers, chiefly in textiles. Nevertheless it is to be emphasized that a training in scientific methods of investigation in general was perhaps even more important than technical knowledge of physiology or biochemistry, since this enabled the investigators to tackle problems which hitherto had received little scientific attention and which did not apparently fall within the scope of any one particular subdivision of the sciences.

List of Workers Who Have Submitted Reports to
the Subcommittee on Protective Clothing

<u>NAME</u>	<u>Occupation before the war</u>
Archer, A. G. (S/L)	Broker
Bassett, H. C.	University teacher and research worker, Physiology.
Bentley, A.	Research worker, Psychology.
Brill, H. L. (S/L)	Medical practitioner.
Brill, H. L. (S/L)	Medical intern at hospital.
Brown, A. C.	University teacher and research worker, Physiology.
Clark, E. (Mine)	Research worker, Textiles
Clark, G. B. (S/L)	Research worker, textiles.
Clark, H. (S/L)	Medical practitioner.
Clark, H. (S/L)	Medical student.
Clark, W. L.	Engineer
Connington, W. J. (S/L)	Textile manufacturer's agent

NAME

Davis, R.C. (W/C)

Duff, R.H.

Emery, J.E. (W/C)

Farnett, R.L.R.

Ferguson, J.M.H. (W/C)

Foss, R.A. (W/C)

Fry, P.H. (W/C)

Gooding, A.S.

Hall, R.H. (W/C)

Hart, J.S. (W/C)

Hewson, D.P. (P/L)

Hoch, H.P. (W/C)

Horn, G.H. (W/C)

Kirk, R. (P/L)

Kitching, J.A.

Kolesar, F.M.

Larose, P.

Lisbel, R. (W/C)

Manderson, G.H.

Moses, T.

Page, R.

Rankin, J.

Robinson, J.

Rogers, J.

Short, J.

Smith, J.

Stewart, J.

Stewart, J.

Thompson, J.W.

Thomson, P.B. (W/C)

Tucker, J.

Waters, R.T. (W/C)

Webb, P.W. (W/C)

Williams, R.S. (W/C)

Woods, J.

Occupation before the war

Researcher in training for commission in R.C.A.F.

University teacher and research

worker, Botany.

Senior teacher, Physics.

Teacher, Mathematics, Agents.

University teacher and research

worker, Pharmacology and Physiology.

Business executive.

University teacher and research

worker, Botany.

Research worker, Botany.

Research worker, Medicine.

Research worker, Zoology.

Research worker, Botany.

Research worker, Botany.

Industrial chemist.

Medical research worker.

University teacher and research

worker, Zoology.

Student of Engineering, Ex-operational

aircrew.

Research worker, textiles.

Medical practitioner.

Student in Physiology.

University teacher and research

worker, Botany.

University teacher and research

worker, Botany.

University teacher and research

worker, Botany.

University teacher and research

worker, Botany.

University teacher and research

worker, Botany.

University teacher and research

worker, Botany.

University teacher and research

worker, Botany.

University teacher and research

worker, Botany.

University teacher and research

worker, Botany.

University teacher and research

worker, Botany.

University teacher and research

worker, Botany.

University teacher and research

worker, Botany.

University teacher and research

worker, Botany.

University teacher and research

worker, Botany.

University teacher and research

worker, Botany.

The office work of the Subcommittee was carried out by Miss M.L. White, while the library of books was in charge of Miss M. Day, in the Department of Medical Research of the University of Toronto.

The clothing on behalf of the R.C.A.F. was carried out in the Department of Medical Research of the University of Toronto, at No. 1 Clinical Investigation Unit, of the R.C.A.F. and at R.C.A.F. Headquarters, Ottawa. The auspices of the Subcommittee of work was extended to include the textile laboratories of the Ontario Research Foundation, Toronto, and National Research Council Laboratories, Ottawa.

Investigations of the properties of textiles, and the wearing of textile materials and leathers for use in aircraft and personal equipment, were carried on in the two divisions. The work done at the Clinical Investigation Unit was in the field of physiological

Research consisted chiefly of the investigation of physiological problems and the design of equipment. The cold room, which was built from 1940, installed by the National Research Council, was located at No. 1 Clinical Investigation Unit. The work of the Subcommittee's representatives at the various laboratories was concerned both with the design

in the Directorate of Aeronautical Engineering, with the representation of the Subcommittee's work to the appropriate service authorities, and with the provision of information as to service requirements. However it is not possible to delineate firmly the type of work done in each place, since there was considerable overlapping. It is also of particular importance to note that, for the solution of any one problem or the development of any one piece of equipment, work was in general contributed by several or all of the institutions mentioned, so that none can claim exclusive credit for a successful outcome. In the same way the scientific contributions of fundamental interest which have resulted from the Subcommittee's work are the result of the interplay of ideas. The work of the Subcommittee consists essentially of the collaborative effort of the various institutions and workers concerned.

Meetings, Minutes and Reports

Meetings of the Subcommittee were usually held approximately every six weeks, although there was no inflexible rule as to this. Alternate meetings were usually open to all interested parties and closed respectively. Closed meetings were held for the discussion of matters of local interest only, while at open meetings it was for the purpose of more general publication to be presented. The minutes of the Subcommittee meetings, which in all cases were prepared by the open meetings, were distributed to all interested parties, including the various armed services.

...the United Kingdom, ...
...the ...
...the ...

...all ... the ... of progress ...
...further action ... followed by the ...
...work towards completion.
...certain suitably qualified indi-
...the Subcommittee for carrying
...the completed development ... handed over
...all necessary information ... appropriate

...the ... were ...
...in ...
...by each ...
...the ...
...a comprehensive account of the
...written record of matters of interest and in order to ensure
...responsibility by their authors, ...
...of each meeting were ...
...visitors, and to ... other services and institutions
...authorized to receive them by the Associate Committee
...Reports were also printed in part or in full in the ...
...of the Associate Committee

...reports by the various members of the Subcommittee
...and by associated workers were discussed very thoroughly and
...in necessary ... with the consent of the authors
...before acceptance. For this purpose they had to be ...
...mitted to the ...
...for reading in advance of the meeting. After acceptance by
...the Subcommittee they were submitted to the Associate
...Committee in the names of their authors but ...
...of the Subcommittee ...
...reports. ... every one possible to reach agreement on
...criteria ... there was very considerable debate,
...frequently referred back to the authors for revision or
...the reporting of data was maintained, and the ...
...the ...
...persons who had given
...and who were supposed to be
...admission

Relations with other Committees

...the ... were ...
...the development
...the ...
...the ...

...when the National Research
...Committee on Protective Equipment was
...investigations were undertaken for this
...also it should be noted that through this last
...at all of it carried out in the first
...Committee on Protective Clothing on behalf
...the air force was applied for the other armed services.

However, it was not necessary for the initial
...formal request be received from a
...Committee. Actually, as might be expected, the
...important contributions of the Subcommittee were
...individual members or groups, and only excited
...the Subcommittee after they had reached a
...stage of development. After difficulties were by
...the Subcommittee to anticipate service requirements,
...since such requirements were made known there was
...usually little time left for the proper development of all

Relations with Industry

Facilities available in the Subcommittee's
...places of work were not suitable for the construction of
...types of equipment required to be developed by the
...it was clearly necessary that much develop-
...should be undertaken in factories having the
...sufficient personnel and equipment. Fortunately
...good co-operation was obtained from busi-
...and not by the scarcity of man power or facilities result-
...ing from a great quantity of urgent government orders of
...kind. As far as possible the Subcommittee endeavoured
...to have work carried out on its behalf, but it is to be
...that the nominal expenses often charged could not in
...many cases repay the time spent by skilled designers in
...attempting to solve unconventional problems. In some cases
...declined to accept payment for
...work. It was always made clear at the
...the Subcommittee had no authority over the
...which might ensue. It was inevitable
...chiefly with firms whose
...from the Subcommittee's
...places of work. It was in some cases a disadvantage that
...Canadian companies were associated with much bigger parent
...companies in the United States, since in these cases the
...industrial research is usually restricted. The
...of individual employees

is also greatly to be appreciated.

Service Requirements

most important and yet most difficult requisite for the carrying out of useful work is the proper understanding of service requirements and conditions to the investigator. Failure to obtain this understanding results in a waste of time in the laboratory and in the factory, and the goal will be jeopardized. Before the Subcommittee much work was carried out without any knowledge of service requirements. The work was done on living aircraft. It was circulated and in 1942 it was much to clarify the general position. Nevertheless it did not and could not provide complete information as to requirements; nor could the view be accepted as a qualification that what members of aircraft think is necessarily what is best for them. It also must insist on full information as to service requirements before entering an investigation. (The work on life jackets and flight suits) Besides all this, the experiences of the Subcommittee confirmed the view, held from the beginning, for an administrative officer, however efficient, to see through the service requirements for an operational experience was found to be essential in every case, and if necessary it was necessary for the research worker to take field conditions for himself. The preliminary of development of equipment in the course that this equipment might be as complete as possible when the work was recorded. All this, incidentally, investigations which could not have been obtained in any other way. The lack of adequate facilities for this purpose was a severe handicap on the early work of the Subcommittee.

On October 10, 1943, at a representative meeting of the Subcommittee on Operational Requirements, the Subcommittee did much to rectify the situation. The members of the Flying Clothing Committee were made to the field both by civilian workers of the Subcommittee. The Flying Clothing Committee at service trials conducted by that Committee proved to be a most useful means of enabling the investigator to see what the requirements were for equipment, and incidentally to see the value of the work. Similar facilities were afforded by visits of members to the Air Command School at Maxwell Field, Alabama, and the U.S. Army Air Corps Field in the

...to the R.C.A. in the United States. It should be pointed out that these visits in the field are approached on the essential and most valuable work of those officers whose duty it was to ascertain the actual requirements, and to enable research workers to study the equipment. It has already been indicated through the more formal channels, the provision of facilities for field visits by investigators and the close cooperation of the Directorate of Operational Requirements enabled certain important pieces of equipment to be developed with a speed which in no way have been approached. In spite of all this, a need for better contact with field conditions throughout the Subcommittee's work. It seems in particular undesirable that a special occasion should have been made of the provision of an Anson aircraft to No. 1 Clinical Investigation Unit, which would for testing equipment, could in no way replace such visits.

Prototypes, Service Trials, Specification and Construction

On completion of the development, it was customary for the Subcommittee to prepare a small number of prototypes of the article concerned and to submit these to the Flying Clothing Committee or Dress and Clothing Committee of the R.C.A. together with a report explaining the construction, methods of use, and performance under laboratory tests of the equipment in question. The fact that several members of the Subcommittee also attended the meetings of the R.C.A. Flying Clothing or Dress and Clothing Committees enabled the Subcommittee's work to be presented the more easily.

In cases where the equipment was requested, these were authorized and supervised by the R.C.A. Flying Clothing Committee. It was usual for the Subcommittee to submit a recommendation for use at the service trials, and as already stated, it was sometimes deemed desirable by the Flying Clothing Committee that a member of the Subcommittee should attend the trials. It was found that a member attending in this way was able to assist very materially in ensuring that questionnaires were answered carefully and seriously. The answers to questionnaires were usually sent to the Subcommittee for analysis in order that a decision could be determined before the specifications were drawn up.

As a result of experience it was found necessary to select individuals who had been most concerned in the development of the equipment and who had been heavily involved in the preparation of the specifications. Accordingly it

the practice for draft specifications to be prepared by the Subcommittee for the two service committees concerned. The draft specifications incorporated all the provisions which those responsible for development considered necessary to ensure that the articles in question would be manufactured in accordance with the method of manufacture. The draft specifications were then converted to the proper form under the supervision of those officers knowledgeable in such matters still in cooperation with the Subcommittee.

Formally the Subcommittee's responsibility ended with the completion of draft specifications. In the case of the more simple articles it was possible for the designers to consider their job finished at this point. More usually, assistance was required for modifications during production and for inspection, and this was done by the Subcommittee at the request of those branches of the Service responsible. The Subcommittee's excellent cooperation with the A.R. Directorate of Aeronautical Inspection, which both assisted the Subcommittee in obtaining services required by the development and production branches, was of great assistance in this respect to production and inspection.

In the case of one entirely novel article of development it was necessary for the development to be completed in accordance with operational needs in close touch with operational pilots, and finally for this equipment to be introduced to the officers in charge of operations and the pilots who used it (page 125). In this particular case only a close cooperation between research workers and pilots made the successful completion of the development possible. Finally, the initial production was undertaken by the Aeronautical Council, which was of great assistance in the development and production of the equipment.

A few instances have arisen in which an article did not receive service trials when its development had been completed, because of lack of immediate need. However, additional prototypes were required long afterwards for trial, because of renewed service interest. It then proved difficult to acquire a sufficient number of prototypes, since materials were scarce and the research and factory workers were busy with other work. In testing of aircraft engines (page 126) the use of prototypes for the failure of the engine for use in the engine, leading to test service requirements (page 126) prototypes resulted in an inferior product. This situation could be avoided by the purchase of a reasonable number of prototypes as soon as development is completed and preliminary testing has shown it to be promising.

FABRIC TESTS

Material to be supplied with same:

MANUFACTURER: _____ MANUFACTURED BY: _____ NO. _____

POSSIBLE USE: _____ FIBRE TYPES: _____ COLOR: _____

AND ADDITIONAL INFORMATION: _____

- * CHEESE RESISTANCE
- * EXTENSION AT BREAK
- * ELASTIC PROOFNESS
- * SLASH RESISTANCE
- * HYDROSTATIC RESISTANCE
- * PERMEABILITY
- * SHRINKAGE
- * SLIPPERINESS
- * TEAR RESISTANCE
- * THERMAL INSULATION
- * ELONGATION
- * FIBRE BINDING POWER
- * FIBRE RESILIENCE
- * FIBRE PERMEABILITY
- * FIBRE SLIPPAGE

received by Secretary:

The work on routine testing of fabrics and other materials was divided between the National Research Council and the Ontario Research Foundation. Some work on leathers was also done at the Ontario Research Foundation. Although an extensive program was carried out on these materials, reports and literature was rarely concerned with leather articles. Work with plastics was for the most part restricted to plastic-coated fabric.

The selection of fabrics for testing and the ordering of results followed an organized routine. Samples of a size sufficient for testing were submitted to the Secretary together with the appropriate form (Figure 1) indicating the proposed use of the fabric and the tests to be made. A part of each sample was retained by the Secretary for record purposes, and the remainder was forwarded to the test laboratories (National Research Council Laboratories and/or Ontario Research Foundation) together with copies of the test form. Completion of the tests requested was indicated on the form, and the testing investigator and the Secretary, and unnecessary tests were avoided if a fabric was found in some respect to be hopelessly unsuitable. Copies of the test reports were forwarded by the Secretary to the investigator and requested the tests. The test results, together with all other data relative to identification of the fabric, were entered on a library card (Figures 2 and 3) on which was also fastened a 6" x 6" sample of the fabric. The library card was prepared in triplicate. A series of the fabric library were maintained in the Secretary's office in the Department of Medical Research, University of Toronto, at No. 1 G. I. B. Building, University of Toronto, and at R. C. A. P. Headquarters, Ottawa, under the care of the Civilian Service Liaison Officer).

During the course of the development of tests, a considerable amount of work of a fundamental nature was done on the properties of fabrics. The relative importance of conduction, convection, and radiation in the transmission of heat through fabrics, and the possibility of obtaining a quantitative evaluation of the rate of radiation exchange from a fabric (G2411, G2412). A fundamental experiment was carried out on the relation of thickness and thermal insulation (G2401). Investigations were also made on the effect of air movement on the thermal insulation of combinations of fabrics (G2411, G2412), the effects of moisture on the thickness and compressibility of pile fabrics (G2490, G2684), and the compressibility of pile fabrics made from various types and weights of fibres (G2337, G2408, G2409, G2570). All these results contributed to the design of the pile lining of the Arctic sleeping bag. The investigation of water vapour transmission through fabrics was also carried out (G2555, G2556) and were applied to the development and evaluation of

the type of vapour permeable fabrics for exposure tests. The work was extended to cover the effect of oil content on the permeability of leather to water vapour (C2724). The rate of drying of fabrics with various initial moisture contents was investigated; it was shown that the type of material is important under certain circumstances (C2724). An unsuccessful attempt was made to render cotton or wool buoyant by means of water repellents (C2318, C2319, C2445). An extensive investigation followed of the properties required for buoyancy in filling materials for life jackets. It appeared that wool and cotton lack certain properties which a buoyant fibre must possess if it is to form a satisfactory filler (C2446). A number of different kinds of animal and vegetable fibres were examined, and several fibres were selected as a suitable substitute for kapok (C2400, C2345, C2414, C2752).

Tests Used for the Evaluation of Fabrics

General Introductory Note

In view of the urgency of military requirements, it was not possible for the Subcommittee to develop a complete range of tests the applicability of which was thoroughly understood and accepted. Nor was any opportunity given to the Subcommittee of comparing the evaluation of fabrics based on laboratory tests with the usefulness of fabrics as proven in service use. There is no doubt that many comparisons of this sort will have to be made before the reliability of various laboratory tests can be established and a means of comparing them can be thoroughly understood. This point of view has been clearly put forward by Peirce (1937). In particular, it seems clear that the interpretation of tests such as breaking strength, tear resistance, abrasion resistance, etc., such as are now used for the evaluation of general fabrics, will remain fraught with uncertainty until a prolonged investigation has been made on serviceability in the field and on performance in the laboratory. Therefore, faced with urgency, the Subcommittee took the best tests it could find and invented some new ones when that was necessary. The various tests used are described fully in a special report on the subject (C2419). A list follows:

Test

Air permeability

Reference to Description

Canadian Government Purchasing Standards - Schedule of Methods of Testing Textiles, 1st Edition, or A.S.T.M. Standards on Textile Materials.

Reference to Description

Breaking strength: grab
test

Canadian Government Purchasing Standards- Schedule of Methods of Testing Textiles, 4-SP-2-1944, or A.S.T.M. Standards on Textile Materials.

Breaking strength: Mullen
burst tester

Canadian Government Purchasing Standards- Schedule of Methods of Testing Textiles, 4-SP-2-1944.

Compressibility

See page 69, also Reports Nos. C2665, C2607.

Compression fluidity

Canadian Government Purchasing Standards- Schedule of Methods of Testing Textiles, 4-SP-2-1944, and A.S.T.M. Standards on Textile Materials.

Colour fastness: effect of

- a. light
- b. perspiration
- c. laundering
- d. salt water
- e. dry cleaning

Canadian Government Purchasing Standards- Schedule of Methods of Testing Textiles, 4-SP-2-1944, and U.S. Department of Commerce. Commercial Standard C3 59-41.

Extensibility

- a. grab test for woven fabrics
- b. Mullen tester for knitted fabrics.

See Report No. C2419

Flameproofness: vertical
burning test

See Report No. C2419. Also Canadian Government Purchasing Standards- Schedule of Methods of Testing Textiles, 4-SP-2-1944, and A.S.T.M. Standards on Textile Materials

Flame Resistance

See pages 34 and 35, also Reports Nos. C2506, C2419.

Non-fibrous Materials

Canadian Government Purchasing Standards- Schedule of Methods of Testing Textiles, 4-SP-2-1944, and A.S.T.M. Standards on Textile Materials.

Test

Reference to Description

thick fabric

Journal of Research of the National Bureau of Standards Vol. 10, 1933.
See Report No. C2419.

See Report No. C2419

See Report No. C2419

Resistance to abrasion
Test Method

Canadian Government Purchasing Standards - Schedule of Methods of Testing Textiles, 4-27-2-1944, Art. 4.3.1 Standards on Textile Materials

On impact on wetting

Canadian Government Purchasing Standards - Schedule of Methods of Testing Textiles, 4-27-2-1944.

Resistance to laundering
fabrics

See Report No. C2419

Slipperiness of lining
fabrics

See page 37, also Report No. C2509.

Snag Resistance:
appraisal

See Report No. C2344

Snag Resistance: tongue
method

A.S.T.M. Standards on Textile Materials - Canadian Government Purchasing Standards - Schedule of Methods of Testing Textiles, 4-27-2-1944.

Thermal insulation

See page 17, also Report No. C2419

See Report No. C2419, also page 37

Lighting power of

See Report No. C2419, also page 31

A hydrostatic test
on fabric

A.S.T.M. Standards on Textile Materials - Modification of A.S.T.M. Code, also Report No. C2419.

Tests specially developed or modified by the Subcommittee described in the preceding sections and furnished by the Subcommittee are also discussed

Thermal Insulation

Scope and Validity of Measurements

Thermal insulation is the resistance offered to the flow of heat, as for instance the resistance offered by clothing to the escape of heat through it from the body to the surroundings. Unfortunately, in the case of clothing it is not possible to characterize the thermal insulation by a fixed value, since it varies with all conditions of wear. It may be affected considerably by such factors as movement, air masses between layers of clothing, (whether arising from wind or from the movements of the wearer), moisture due for example to rain or perspiration on the fabric, such as may occur under the heat and sweat when the wearer is working. However, for the evaluation of certain types of clothing, and as a first approximation, it is possible to make a determination of the thermal insulation of whole garments under certain conditions. This section deals with the thermal insulation of fabrics used in clothing; the physiological aspects of the thermal insulation of clothing are discussed on pages 47.

Measurement of thermal insulation is based on the relation

$$\text{Thermal Insulation} = \frac{\text{Difference of temperature}}{\text{Heat flow per unit area}}$$

There is a clear analogy with Ohm's law. Just as in the case of electricity it is much more convenient (because of the smallness of thermal resistance (insulation) than of conductivity) to speak of layers of insulating material placed between the source and destination of heat, the resistive effect of these resistances is additive, just as for electrical resistance impeding the flow of electricity.

$$\text{Total area} = \frac{\text{Difference of temperature}}{I_1 + I_2 + I_3 \text{ etc}}$$

Of the various thermal resistances, the most important is that of a particular fabric to the thermal insulation of the clothing. In practical application it is necessary for the thermal insulation of the fabric to be measured under conditions affecting the body.

The thermal insulation of the body may be determined in a number of ways. The most common method is to measure the heat loss from the body under various conditions. This may be done by measuring the heat loss from the body in a calorimeter, or by measuring the heat loss from the body in a room with a known heat loss.

... through the test specimen over-lying it. The difference of temperature on the two sides of the specimen, and from the thermal insulation, heat flow is assumed to be identical. From the experimental arrangement, with that through the test sample. From this and from the difference of temperature between the two sides of the test sample, the thermal insulation of the latter is then computed.

Experiment (2410) resulting from the test-
 of numerous samples has shown the importance of very
 thorough precautions to prevent loss of heat by ways other
 than through the test sample. The second apparatus des-
 cribed above was rather too small (7 inches in diameter,
 including the guard ring), so that the ratio of edge to
 central area was high. As a result, a small loss of heat
 from the edges introduced a serious error in the estima-
 tion of the heat flow through the test fabric. Much more
 satisfactory results were got with the B.R.C. apparatus
 (surface 13 inches square, including the guard
 plate).

The results of the measurements of thermal in-
 sulation may be expressed in British thermal units or in
 the "C.I.U." unit. In the evaluation of clothing a new unit,
 the "C.I.U." has been proposed (see, Burton and Foxett,
 1941, page 47). It has been found convenient to use
 this unit also for the expression of the thermal insula-
 tion of fabrics. The thermal insulation of 1 cm. of ideal
 still air (see below) may also be used as a unit. The
 following are the conversion factors:

1 C.I.U. = 0.176 B.T.U./sq. ft. = 0.18 C.G.
 B.T.U./hr./sq. ft. = 0.18 C.G. = 1 C.I.U.

0.18 C.G. of ideal still air

Open Method

As already indicated above, for measurement
 of thermal insulation the fabric sample may either be cover-
 ed with a glass plate or left open to the air. The results
 of the two methods are widely different (22410). In
 the open method the estimation of flying soil inter-
 vening (such as the pile fabrics), which are used under
 winter wear, the open method might be considered more
 suitable for the evaluation of fur as used in fur coats,
 and of half facing fabrics. The insulation of an outward-

... of wind and convection currents by convection currents. ... (Grell). ... Type B (Ready Board) facing outwards. When these were worn with the side facing normal insulation (as measured experimentally) addition of a very light ... had a similar beneficial effect.

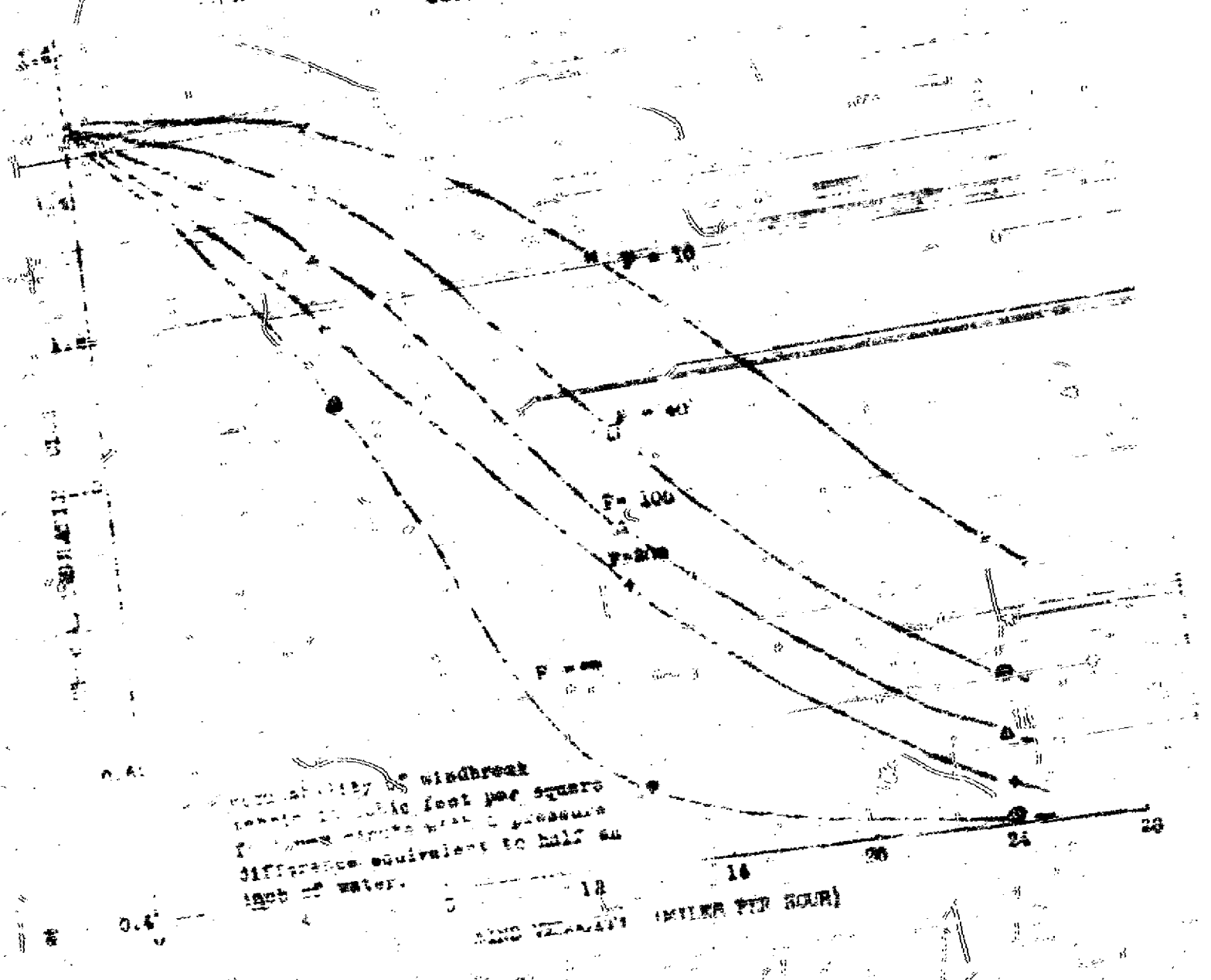
There is a further important difference between the closed and open methods. When the open method is used, the temperature is usually measured, not immediately on the inside of the fabric sample, but immediately on the inside of the room. In the room air at some distance from the fabric sample, the air is immediately overlying the fabric and contributes to the estimated insulation (Grell). It is difficult to determine how much of the observed insulation is due to the fabric and how much to the room air. A standard method of correction from the observed total (see page 30) is used. This procedure may lead to an appreciable error for the purpose of air movement, since under such conditions the air movement results in a considerable error in the estimation of the insulation of the fabric.

AIR MOVEMENT

As stated above, the thermal insulation of a clothed man is reduced by air movement. The air layer immediately adjacent to the body is disturbed and its insulation is impaired, and the insulation of the body is thereby reduced. (Grell, 1941) on the effect of air movement on the thermal insulation of pile fabrics these tests were of course done by the open method, and a correction has been made for the thermal insulation of the air. It is to be noted that the results given below are for the case where a stream of air was directed at the body. The velocity of air movement was controlled with diaphragms and the velocity of air movement was measured in three ways. A pressure indicator at the fabric surface was used. The last method seems to be the most convincing in that it depends on conditions at the fabric surface and not at a little distance away.

(Grell, 1941) got with the wind directed at the surface of the fabric and the results were as follows:

FIGURE 4
Thermal Insulation of Combination of Coverall Fabric
and Double Pile Fabric beneath it with Various Degrees
of Air Movement and Various Resistances to Air of
Coverall Fabric.



...the much larger loss in ...
...of the overriding all due to air movement. This
... (1941) has been confirmed by the U.S. War
... Department's Climatic Research Laboratory. For higher
... altitudes there is a much greater advantage in a
... high degree of impermeability to air. This is illustrated
... only to the fabrics used for the tent.

TABLE 1

7415 Fabric (0.00" thick at 0.1 lb./sq.in.), with overlying
coverall fabric having a permeability to air of 10 cu.ft./
sq.ft./min. at water difference of air pressure

CONDITIONS OF SALE

THE ~~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~~ ~~2101~~ ~~2102~~ ~~2103~~ ~~2104~~ ~~2105~~ ~~2106~~ ~~2107~~ ~~2108~~ ~~2109~~ ~~2110~~ ~~2111~~ ~~2112~~ ~~2113~~ ~~2114~~ ~~2115~~ ~~2116~~ ~~2117~~ ~~2118~~ ~~2119~~ ~~2120~~ ~~2121~~ ~~2122~~ ~~2123~~ ~~2124~~ ~~2125~~ ~~2126~~ ~~2127~~ ~~2128~~ ~~2129~~ ~~2130~~ ~~2131~~ ~~2132~~ ~~2133~~ ~~2134~~ ~~2135~~ ~~2136~~ ~~2137~~ ~~2138~~ ~~2139~~ ~~2140~~ ~~2141~~ ~~2142~~ ~~2143~~ ~~2144~~ ~~2145~~ ~~2146~~ ~~2147~~ ~~2148~~ ~~2149~~ ~~2150~~ ~~2151~~ ~~2152~~ ~~2153~~ ~~2154~~ ~~2155~~ ~~2156~~ ~~2157~~ ~~2158~~ ~~2159~~ ~~2160~~ ~~2161~~ ~~2162~~ ~~2163~~ ~~2164~~ ~~2165~~ ~~2166~~ ~~2167~~ ~~2168~~ ~~2169~~ ~~2170~~ ~~2171~~ ~~2172~~ ~~2173~~ ~~2174~~ ~~2175~~ ~~2176~~ ~~2177~~ ~~2178~~ ~~2179~~ ~~2180~~ ~~2181~~ ~~2182~~ ~~2183~~ ~~2184~~ ~~2185~~ ~~2186~~ ~~2187~~ ~~2188~~ ~~2189~~ ~~2190~~ ~~2191~~ ~~2192~~ ~~2193~~ ~~2194~~ ~~2195~~ ~~2196~~ ~~2197~~ ~~2198~~ ~~2199~~ ~~2200~~ ~~2201~~ ~~2202~~ ~~2203~~ ~~2204~~ ~~2205~~ ~~2206~~ ~~2207~~ ~~2208~~ ~~2209~~ ~~2210~~ ~~2211~~ ~~2212~~ ~~2213~~ ~~2214~~ ~~2215~~ ~~2216~~ ~~2217~~ ~~2218~~ ~~2219~~ ~~2220~~ ~~2221~~ ~~2222~~ ~~2223~~ ~~2224~~ ~~2225~~ ~~2226~~ ~~2227~~ ~~2228~~ ~~2229~~ ~~2230~~ ~~2231~~ ~~2232~~ ~~2233~~ ~~2234~~ ~~2235~~ ~~2236~~ ~~2237~~ ~~2238~~ ~~2239~~ ~~2240~~ ~~2241~~ ~~2242~~ ~~2243~~ ~~2244~~ ~~2245~~ ~~2246~~ ~~2247~~ ~~2248~~ ~~2249~~ ~~2250~~ ~~2251~~ ~~2252~~ ~~2253~~ ~~2254~~ ~~2255~~ ~~2256~~ ~~2257~~ ~~2258~~ ~~2259~~ ~~2260~~ ~~2261~~ ~~2262~~ ~~2263~~ ~~2264~~ ~~2265~~ ~~2266~~ ~~2267~~ ~~2268~~ ~~2269~~ ~~2270~~ ~~2271~~ ~~2272~~ ~~2273~~ ~~2274~~ ~~2275~~ ~~2276~~ ~~2277~~ ~~2278~~ ~~2279~~ ~~2280~~ ~~2281~~ ~~2282~~ ~~2283~~ ~~2284~~ ~~2285~~ ~~2286~~ ~~2287~~ ~~2288~~ ~~2289~~ ~~2290~~ ~~2291~~ ~~2292~~ ~~2293~~ ~~2294~~ ~~2295~~ ~~2296~~ ~~2297~~ ~~2298~~ ~~2299~~ ~~2300~~ ~~2301~~ ~~2302~~ ~~2303~~ ~~2304~~ ~~2305~~ ~~2306~~ ~~2307~~ ~~2308~~ ~~2309~~ ~~2310~~ ~~2311~~ ~~2312~~ ~~2313~~ ~~2314~~ ~~2315~~ ~~2316~~ ~~2317~~ ~~2318~~ ~~2319~~ ~~2320~~ ~~2321~~ ~~2322~~ ~~2323~~ ~~2324~~ ~~2325~~ ~~2326~~ ~~2327~~ ~~2328~~ ~~2329~~ ~~2330~~ ~~2331~~ ~~2332~~ ~~2333~~ ~~2334~~ ~~2335~~ ~~2336~~ ~~2337~~ ~~2338~~ ~~2339~~ ~~2340~~ ~~2341~~ ~~2342~~ ~~2343~~ ~~2344~~ ~~2345~~ ~~2346~~ ~~2347~~ ~~2348~~ ~~2349~~ ~~2350~~

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, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 26

1.60

1.42



1. **THE STATE OF TEXAS, County of _____, do hereby certify that _____, of the County of _____, State of _____, is the duly qualified and authorized representative of the _____, a corporation organized under the laws of the State of _____, and is authorized to execute and deliver the foregoing instrument, and to perform all acts and duties required of him in connection with the execution and delivery of the same.**

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, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 26

—

1990年12月

TABLE 1. Outside net

1725

2.30

1.70

0.95

102-51

Administrations

44

100

able to other fabrics, or approximately the same characteristics. The presence of other fabrics or air spaces (as in clothing) underneath the pile fabric might to some extent modify the results. In any case, it must be remembered that in clothing the shape of the exposed surface is different from the flat surface used in laboratory tests, and part of this surface will be on the side sheltered from the wind, so that the effect of air movement ~~may~~ will be less. The loss of insulation due to wind penetration is considerably less when the angle between the direction of the wind and the surface of the fabric is less than 90° (C2831).

[Faint, illegible text]

ANALYSIS (GS404) has been made of the relative importance of improving the design of existing facilities might be explored.

...evidence (C2454) to indicate
"best" construction by the "best" process in insignificant
fabrics used in clothing. Speaker and Chamberlain (1930)
...the least dense fabric. Further reduction
...the

... fabric used for ... is extremely ... within the range of densities over which ... Furthermore, compression of the double pile ... less than half its original thickness does not ... its thermal insulation per unit (actual) thickness ... In all these cases the thermal insulation ... thickness is the same as that for air space filled with kapok (G2464), which is one of the best insulating materials available. However, for denser fabrics (such as uniform material), the thermal insulation per unit thickness is distinctly lower (Speckman and Chamberlain, 1930). It can be concluded that, in the case of the best insulating materials, such as the double pile fabrics, there is no practical possibility of decreasing heat loss due to conduction by the fibres or yarn, since the ideal of no conduction has already been so nearly achieved (G2464). It is represented by the thermal insulation of a very narrow air space (G2464).

The parts played by convection, conduction, and radiation in the transmission of heat across the air spaces in fabrics have been investigated indirectly (G2464) by measurement of the thermal insulation of air spaces of various thicknesses between two plates. From Figure 8, it is seen that the insulation of an air space increases with thickness, but that the rate of increase gradually levels off. Finally (at about 0.7 cm. the approximate thickness of "still" air) there is no further increase no matter how wide the air space. This falling off is to be sacrificed to the development of convection currents. For narrow air spaces the thermal insulation is practically proportional to the thickness, and from the shape of the curve (Figure 8), it is clear that the narrower the air space the more nearly is this true. Therefore it is reasonable to assume that for the extremely small air spaces in fabrics convection has already for all practical purposes been reduced to the minimal attainable value. Therefore no further improvement in the insulating power of a fabric is to be expected from a change in the size of the individual fibres or pores. (This statement does not apply to the case in which the pores approximate to the mean free path of the molecules in the air, as in the case of silica aerogel. In this case, the transfer of heat by conduction in the air spaces is still further reduced. The diameter of the pores under consideration is of the order of one tenth of a micron -- far below the average for textile fibres.)

Consideration (G2464) has been given to the problem of the thermal insulation of clothing by the suppression of radiation, both within the fabrics and at their surfaces. The part played by radiation in the transfer of heat across air spaces was investigated by ... which in some cases the two plates

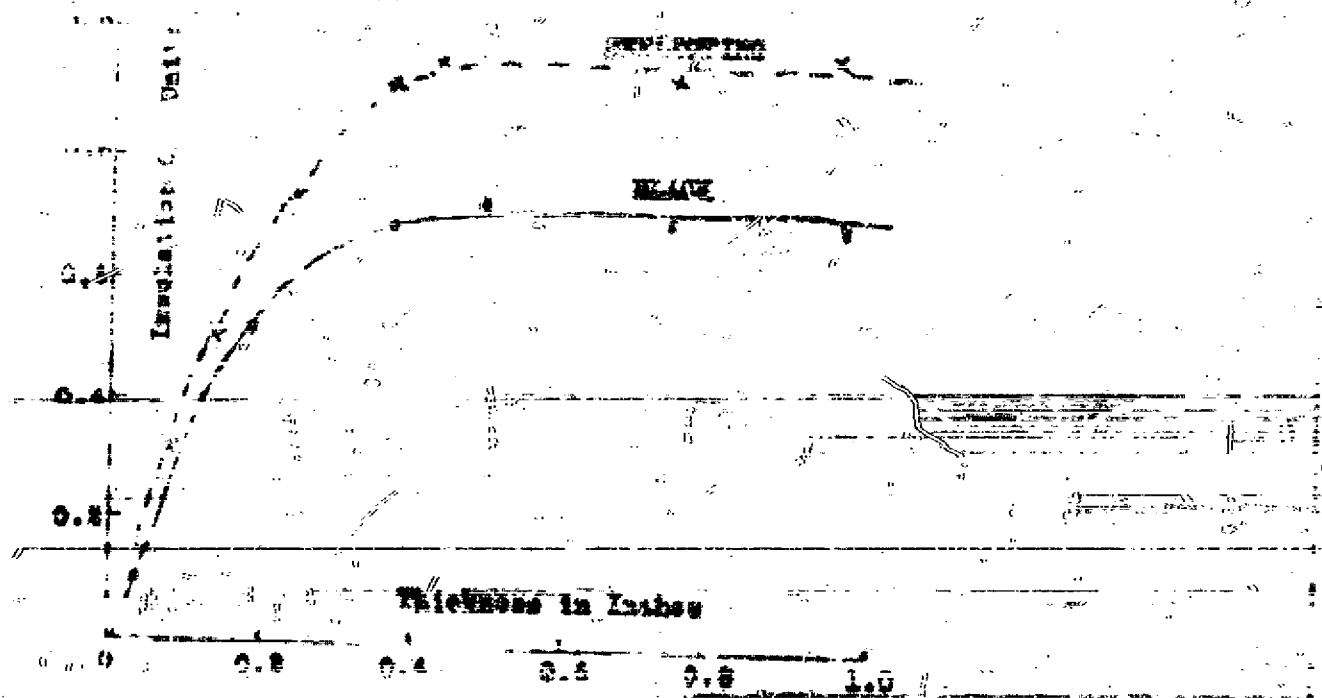


FIGURE 2
 Thermal insulation of an Air Space of Varying Thickness
 with the Boundary Black and Reflecting.

and in some cases were covered with a polished metal surface so that radiation was reduced to a minimum. For air spaces wider than 0.7 inches, the thermal insulation increased by about 40% by suppression (as far as possible) of radiation. For narrower air spaces the relative importance of radiation became progressively more important. The narrower the air space the greater the loss by means other than radiation, while radiation is independent of the width of the air space. Suppression of radiation from an air space bounded by plates one tenth of an inch thick improved the insulation by about 20%. It was therefore concluded that for the small air spaces in clothing the elimination of this radiation loss, such as it may be, would need textile fibres with reflecting surfaces.

From these tests it seems that radiation must play a more important part in the transfer of heat across air spaces than that occurs between the different layers of clothing and in the loss of heat from the outside surface of the clothing. Other tests were carried out with fabric covered with a layer of paper. The paper was coated with a reflecting aluminium paint (reflecting power probably around 90%) on each side. In some tests one or both sides of the paper were then painted over with a dull black paint (reflecting power around 10%). The following results were got: (Table IV)

TABLE IV

Thermal Insulation of Fabric Covered with a Layer of Paper, at C.I. per sq. cm. covered with a layer of Paper, with Overlying Room Air, Measured by the Open Method under Conditions of Still Air

Surfaces of Paper	Thermal Insulation (C.I.)
Both surfaces black	2.0
Upper surface reflecting	2.3
Lower surface reflecting	2.2
Both surfaces reflecting	2.45

From some additional insulation was gained by reduction of surface loss between the pile and the paper, and from the gain in insulation of the outside air (under still conditions), which agrees with the value (C.I. 0.3) for the gain in insulation by the use of reflection for all air spaces above about three quarters of

in such cases. However, under windy conditions a reflecting surface inside of the clothing can make little difference. Under such conditions the rate of loss of heat by convection from the surface of the clothing is so great that the loss by radiation is relatively negligible.

It is concluded from the above considerations, that there is extremely little scope for the improvement of materials such as the double pile fabric in respect of thermal insulation. This statement is based on tests made under conditions of still air, and might not be applicable when there is movement of air within the clothing. Apart from this, the slight improvement could be achieved by the use of ~~more insulating~~ materials within the clothing, but it is very doubtful if the gain in insulation would outweigh the increased weight and difficulties of manufacture. The usefulness of a heat-reflecting surface on the outside of the clothing, to reduce heat loss, is much impaired by air movement, so that this also is likely to be of very small value. This statement does not apply to helmets, which are discussed briefly in the next section.

Insulation by Reflection

Considerations of insulation by reflection, as applied to clothing, have been discussed in the previous section. Some consideration has also been given to the properties required for reflecting surfaces (C2463).

Insulation by reflection may be used (C2464) for quite different purposes: to reduce heating of the body by absorption of the sun's radiation at the surface of the clothing, and to reduce cooling of the man by radiant transmission of heat through the clothing from him to the outside. The requirements of reflecting surfaces for these purposes are quite different. To shield heating by the sun a surface must reflect the sun's radiation, which is spread over a fairly wide range of wavelengths but which lies mainly in the visible range. Thus the outside of sun helmets, sunburn creams, etc., cannot both be inconspicuous and remain cool in a strong sun. On the other hand, for the conservation of heat there must be good reflecting power for long wave (or heat) radiation. The reflecting surface must be of no consequence.

A number of tests were carried out (C2464) with the cooperation of Canada's Industries Limited (Paint and Varnish Division, Toronto), of the reflecting power of various paints for the sun's radiation. For convenience a carbon arc or gas-filled tungsten filament light was used, the spectral distribution of its radiation being sufficiently similar to that of sunlight. Various identical metal cans

A suit with reflecting layers was constructed under the auspices of the National Research Council. It is understood that this conclusion was supported by their experience.

...this radiation. The ... black ... assumed to be 5%, another polished ... assumed to be 0.5% and the third ... The percentage ... of the rise in temperature of the air inside ... in each of the other two. The results ... the best camouflage have ...

Lead olive green ... (C2444) ... ordinary olive drab camouflage ... from ... in infra-red absorption, and therefore showed ... This point was found ... to have a distinctly better power of ... than ordinary olive drab ... because of its infra-red reflecting properties. Objects ... with this special paint would get slightly less ... than if painted with ordinary olive drab ... more effective than aluminum paint (C2444).

The reflecting power of ealene fabrics (which ... for M.A. gun's radiation was tested (C2444) ... a report (Gregory, 1930) that it is higher than ... of other fabrics. However, it was found that this ... is strongly reflected from these ... that the total reflecting power of the ealene side is no ... greater than that of the dull side.

For the purpose of increasing the ... in ... to coat a cloth with a heat-reflecting ... layer of metal paint. It was found that commercially ... cloth had poor reflecting power ... conditions must be fulfilled by ... the medium in which the particles ... must transmit heat radiation with the least ... absorption, and the particles themselves must ... of a number of lacquers used for ... suspending metallic particles showed that these varied ... in their absorption of heat radiation. Vinylite, ... vinyl acetate, and ethyl cellulose were good (coefficient ... of absorption small) while a small ... was found to be particularly bad. The ... aluminum particles used was also found to be ... that particles of average diameter ... poor reflection and heat ... to be expected ... of the reflecting power ... by the particles ...

...to the wave length of the light to be reflected. This means a surface covered with small particles which reflect light as a body reflects long wave (or heat) radiation.

Following the principles outlined above, a cloth of heat-reflecting power of about 70% was obtained by the application of a light tan varnish. This was done by spraying with a paint made of fairly uniform sized aluminum particles suspended in a medium of Vinylite (Vino) and appropriate solvents and plasticizers. No attempt was actually made to incorporate this fabric in clothing as it was felt that the possible gain was very slight. But the same paint could be used on the inside of hats, coats, etc., especially under hot conditions when it is desired to reduce the inward radiation of heat resulting from the absorption of sunlight.

Effect of Thickness on Thermal Insulation

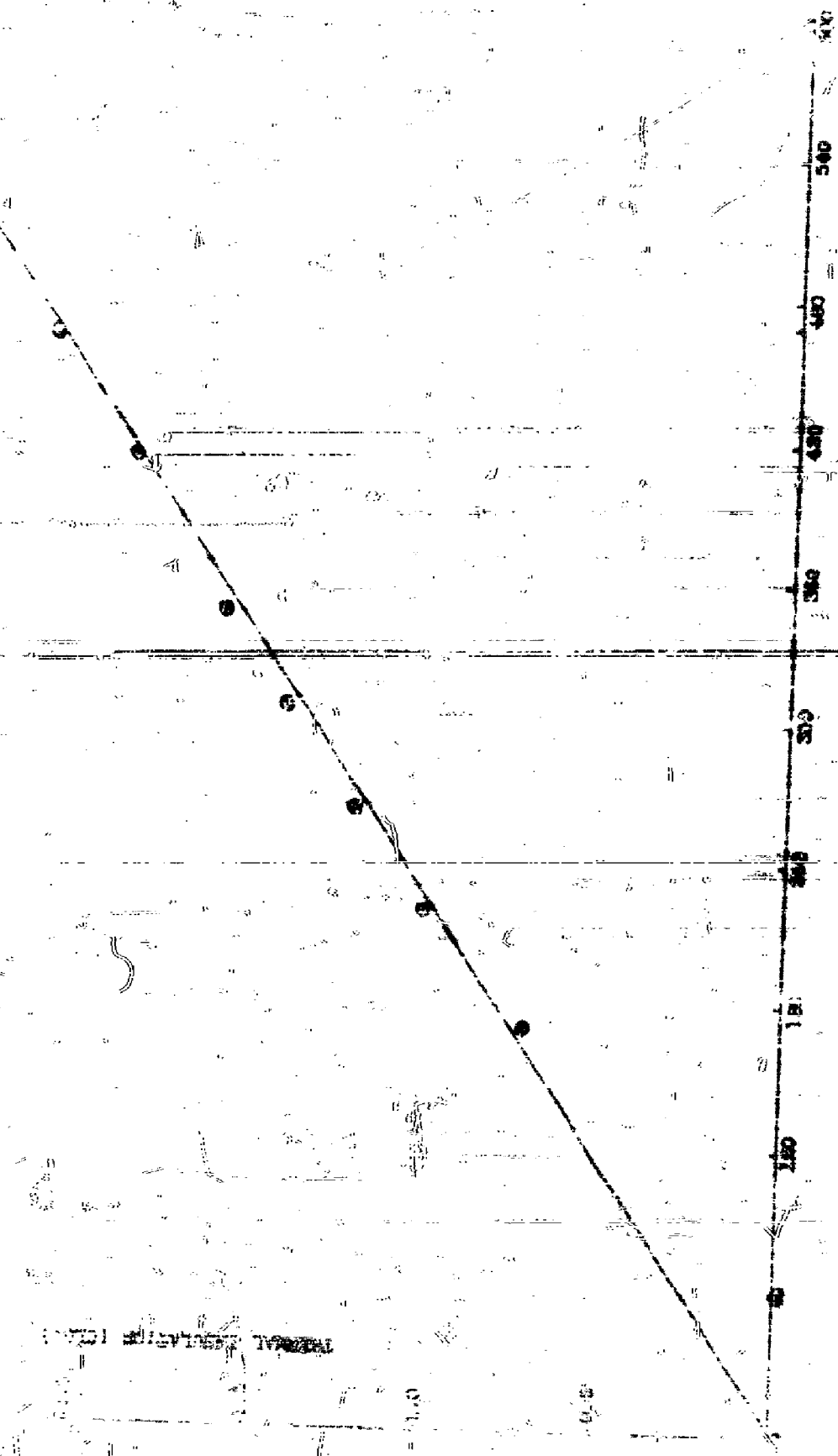
It follows from the definition of thermal insulation in terms of rate of heat flow and difference of temperature (in which serial resistances are additive, see page IV) that two layers of the same (uncompressed) fabric have twice the thermal insulation of one layer, and so on. When the fabric was compressed, it was found (CE46C) that the thermal insulation was proportional to the square root of the fabric thickness under the conditions of the test (Figure 6). This is in agreement with the general results of Speckman and Chamberlain (1931) already quoted (page 22). For purposes of the design of flying suits, it has therefore been assumed that the thermal insulation of a pile fabric is proportional to its effective thickness. The same general principle may be applied, though less rigidly, to the clothing as a whole.

It is considered, in view of the conclusions of earlier sections, that it is not feasible to design a flying suit of the greatest insulation per unit thickness of fabric and of the lightest weight. Accordingly, for such fabrics used in the linings of flying suits, the design of the lining is a cloth which, under the conditions of use, will have and retain the greatest possible thickness consistent with such other requirements as the weight of the suit.

Cloths for the reflection of heat radiation have also been developed by the U.S. Army and Navy, and by the U.S. Navy. They are kindly supplied by Canada Bronze Powder Company.

FIGURE 4

THE REAL CORRELATION OF DO IN THE PACIFIC OCEAN
VARIATION WITH DISTANCE



100-443887-100

It was concluded that the thermal insulation
thickness is directly proportional to the actual
thickness of the insulation. The data shown
in the graph indicate that the average thickness
of the insulation is approximately 1.5 inches and
is incorporated into the design.

TWO methods have been used for the experimental
use may be made of pile fabrics: their thick-
ness is chosen in the same way as in such a way that
the pressure of the pile does not come out from
between the plates which flatten the protruding hairs
which it exerts. The second method seems to conform more
to the conditions of use in flying clothing.
The work which is

The fabrics incorporated in clothing are
the lining of the suit. In the case of the
the greater part of the compression is
the lining. The argument is believed (see, page 57)
as such, the amount is less than 0.1 the
the fabric is compressed in clothing and
the compression is in the way of being
the compression may be much greater, as for instance
under the seat (see page 57). It is therefore of more
value to estimate the value which a pile
will assume during and after the treatment, rather

[illegible]

...and the

Accordingly, a detailed study (02465) was made of the thickness of double pile fabric during repeated cycles of compression and release from pressure. For this study the compressionometer was fitted with a (5 inch diameter) foot than usual, in order to minimize the effect of possible local irregularities in the pile of the fabric. Tests were carried out over a wide range of pressures and times of compression and release. The results of one series of tests are illustrated in Figure 3. Each sample was subjected alternately to low pressure for one minute, then to high pressure for one minute, then low pressure for one minute, and so on repeatedly. The thickness was measured at the pressure in question at the end of each minute. From the graph it will be seen that the thickness of the fabric, at low pressure (0.1 lbs. per sq. in.) is about the same as the thickness at high pressure (10 lbs. per sq. in.) immediately after release. The greater the pressure the less the thickness at which it recovers. However, in all cases there is a rapid loss of thickness during the first few cycles of compression and recovery, followed by a gradual decline during the later cycles (02465). It has been shown to be true for piles of wool, which are known to be more resilient than wool. The rapid loss of thickness during the first few cycles can be restored by brushing. The subsequent gradual decline, which persists for some time after some hundreds of cycles, may be due to a permanent change in the structure of the fibres.

Examination of used lining 02465 (02469) showed that the thickness of their linings varies considerably. The least thickness of the pile (when new) is subject to variation. However, the lining of the used lining 02465 (02469) had the least thickness. The extent of the decrease, after the first few cycles of compression and recovery, was sufficient to indicate that the rapid initial loss of thickness (as found in the laboratory tests) had been passed, and that the pile had entered on the gradual decline. In the case of double pile fabric from the back of the most used suits, the thickness corresponded to that which was found experimentally after some hundreds of cycles of compression and recovery at 10 lb. per sq. inch (with release to 0.1 lb. per sq. in.). As a result of this investigation it was concluded (02469, 02469) that a representative estimate of the thickness of a pile fabric during use could be obtained by measurement at 0.1 lbs. per sq. in. after a sufficient number of cycles of compression and recovery to bring the fabric to the state of gradual decline. For this purpose five

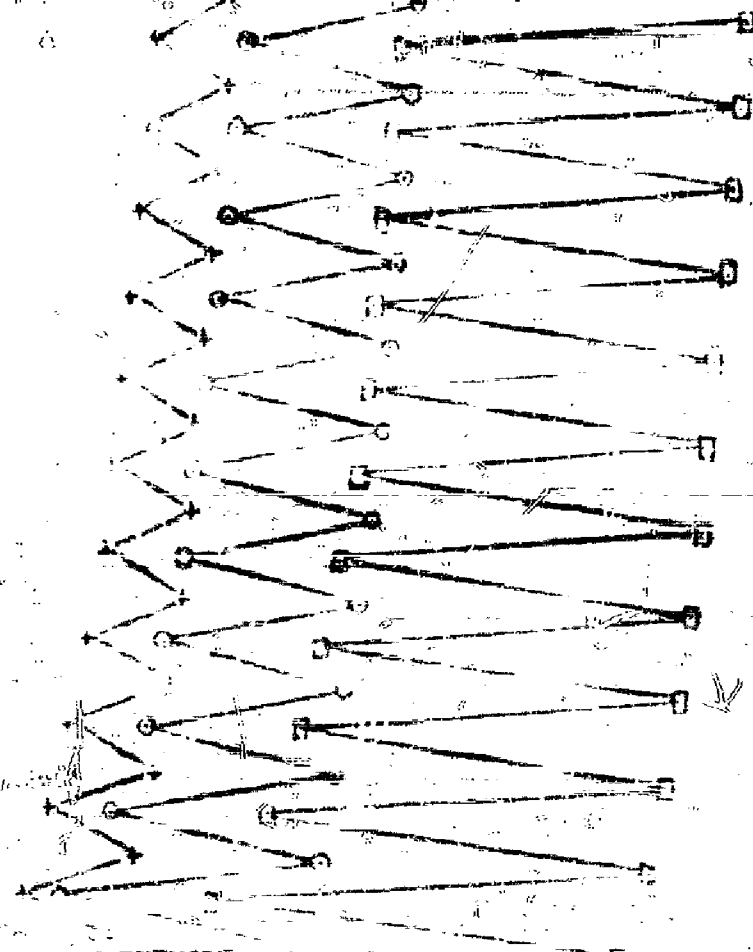
cycles of compression and recovery at 10 lb. per sq. in. at which the thickness of the pile is permanently justified by the

Readings for fabric compressed
alternately at 0.1 (upper
points) and 0.3 (lower points)
lbs. per sq. inch.

Readings for fabric compressed
alternately at 0.1 (upper
points) and 0.3 (lower points)
lbs. per sq. inch.

Readings for fabric compressed
alternately at 0.1 (upper
points) and 0.3 (lower points)
lbs. per sq. inch.

Readings for fabric compressed
alternately at 0.1 (upper
points) and 1.0 (lower points)
lbs. per sq. inch.



SUCCESSIVE READINGS

READINGS OF KNULE PINE FABRIC (L 74)

INTER SUCCESSIVE READINGS

An index of compressibility was required to
 relate the change in thickness of the fabric result-
 ing from compression forces exceeding the basic value
 of 0.1 lbs. per sq. in. to conditions representative
 of use in compression. It was found experimentally (after
 testing and recovery) as pre-
 viously defined that the thickness of a fabric is
 proportional to the logarithm of the pressure applied.
 The slope of this line can therefore be used to
 determine the change in thickness of the fabric when
 subjected to any pressure within the practical
 range. It is convenient to express the change
 in thickness as a percentage of the original

Index of compressibility

$$\frac{t_2 - t_1}{t_1} \log_{10} \frac{p_2}{p_1}$$

where t_1 reference thickness (say at 0.1 lbs. per sq. in.)
 t_2 thickness at pressure p_2
 p_1 as 0.1 lbs. per sq. in. and p_2 as 1.0 lbs.
 per sq. in.

Thickness at 0.1 lbs./sq.in.
 Thickness at 1.0 lbs./sq.in.
 Thickness at 0.1 lbs./sq.in.

Thus the functional loss of thickness on compression
 is a function of the pressure applied. These values are, of course,
 only valid for the pressure in question, as a result (in the
 case of pressures above 0.1 lbs. per sq. in.) of a series
 of measurements of thickness at different pressures.
 An accurate result can be obtained if determinations of
 thickness are made at several different pressures, and if
 the thickness at 0.1 lbs. per sq. in. is then estimated
 from the best straight line relating thickness with logarithm
 of pressure. The index of compressibility finally
 will describe the behaviour of the fabric over
 the range of pressures (0.1 to 1.0 lbs. per sq. in.)
 of interest.

provides a complete description of the compressibility of a particular sample of pile fabric, yet it does not necessarily yield any general information on the compressibility of different types of pile except in well-controlled experiments in which all factors are kept constant except the one under investigation.

Compressibility of Different Types of Pile Fabrics, and Effect of Moisture

A comparative study (1930) was made of the thickness and compressibility of a wide range of different pile fabrics with different contents of regain moisture. The compression was carried out before the standard system had been developed of measuring thickness and compressibility. The results were of a cycle of compression and release of pressure. Therefore in these experiments the thickness was measured directly (without previous compression) at 0.5 lbs. per square inch, then at 1.0 lbs. per square inch, and finally at 0.1 lbs. per square inch, after a period for recovery. Not much reliance can be placed on small differences, since the previous history of the sample will considerably influence the result when the thickness is measured directly. However, the larger differences can safely be accepted. Little difference was found in the resistance to compression of a range of double pile fabrics with the pile made of wool of qualities ranging from 40s to 48s. In general, the thickness and recovery of compression of fabrics with a wool pile was but little affected by regain below 10%, but higher regains had an adverse effect. However, when the moisture content was found to be low, the resistance to compression was found to be low. The resistance to compression was found to be low over the range of 3 to 10% regain. With a double pile fabric of wool and rayon the loss of thickness and impairment of recovery was more marked at regain levels above 10%, than in the case of double pile fabrics with the pile made of wool only. Very good results were obtained with a short pile fabric and in shearing. However these materials are also much heavier than the double pile fabrics under consideration. Excellent results were obtained with a short pile fabric, but however this was due no doubt partly to the shortness of the pile. A sample of double pile fabric with pile of mohair and wool did not give results any better than those with a pile of wool only. Nevertheless it is suggested that additional samples should be made up with mohair in them. Apart from this, the resistance of pile fabrics to compression might be improved by the use of a different pile material, but this is beyond the scope of the present investigation.

Figure 9

Compression of Double Pile Fabric.

• Double Pile Fabric IL-29

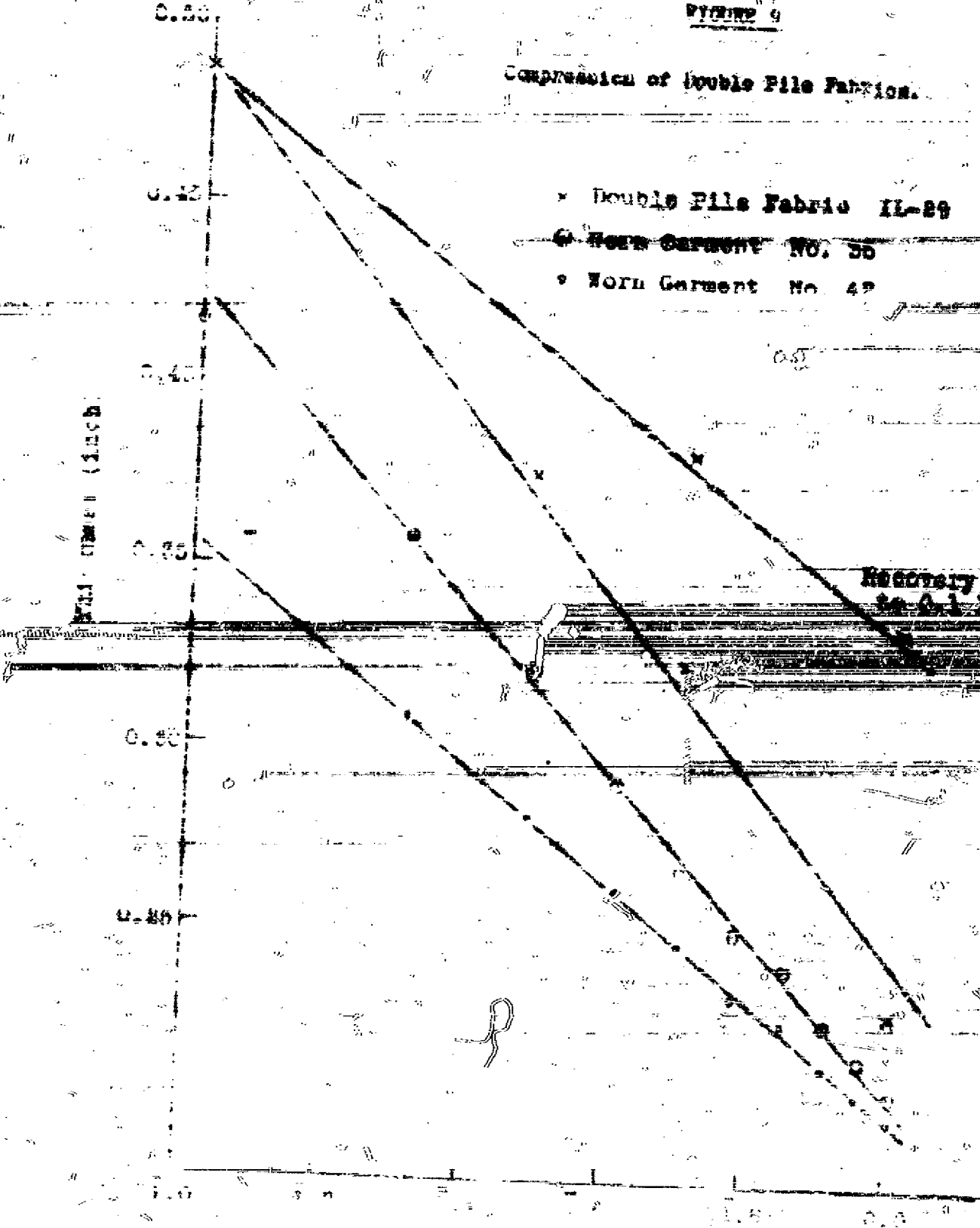
• Worn Garment No. 35

• Worn Garment No. 42

Worn Garment (inches)

Recovery
to 0.1 in.

Log Pressure



Tuft Binding Power of Pile Fabrics

It was desired to reduce the weight of the ground as the double pile fabric used for the linings of flying suits as much as was possible without serious impairment to the security of the pile tufts. A test was therefore developed for tuft binding power (C2419). In this test an individual tuft of the pile is gripped in the carriage jaw of an inclined plane yarn tester, and the fabric is clamped or securely held the machine is started and allowed to operate until the tuft pulls through. The average load at which this occurs is taken as the tuft binding power. Only tests in which the nominal tuft strength was accepted, and certain precautions have to be taken (C2419).

Result of tests carried out by this method, (as well as tests for permeability and piling) a reduction in the weight was effected on the ground of the double pile fabric in production for the H.B.A.P. (C2420). Reduction in the weight of the ground also resulted in an increased pileability of the fabric without significant detriment to the effective tuft strength or resistance to compression. The weight of ground finally selected (meeting 10) was the lowest which would permit of the accommodation of the tuft density used with this fabric.

Permeability of Materials to Water Vapour

General

In accordance with Fick's Diffusion Law, the mass (M) of water vapour which passes through a homogeneous material in a given time (t) is proportional to the area (A) through which the transfer is taking place and to the difference of vapour pressure ($P_a - P_b$) on the two sides of the material and inversely proportional to the thickness (l) of the material. The constant relating these variables may be written as one of three properties, in which case it represents the permeability, or as an one of inverse proportionality (α), in which case it represents the resistivity of the material for water vapour, as in the following equation:

$$M = \frac{A(P_a - P_b)t}{l}$$

The difference of resistivity (α) may be combined with the permeability of the material to give one resistance (R) or permeability of the material under conditions of constant of resistivity rather than permeability combining the separate effects of a series of materials. (Gregory 1934)

Thus, if the passage of steam vapour through a pile of material is considered

$$\frac{M}{t} = \frac{A(P_2 - P_1)}{R_1 + R_2 + R_3 \text{ etc.}}$$

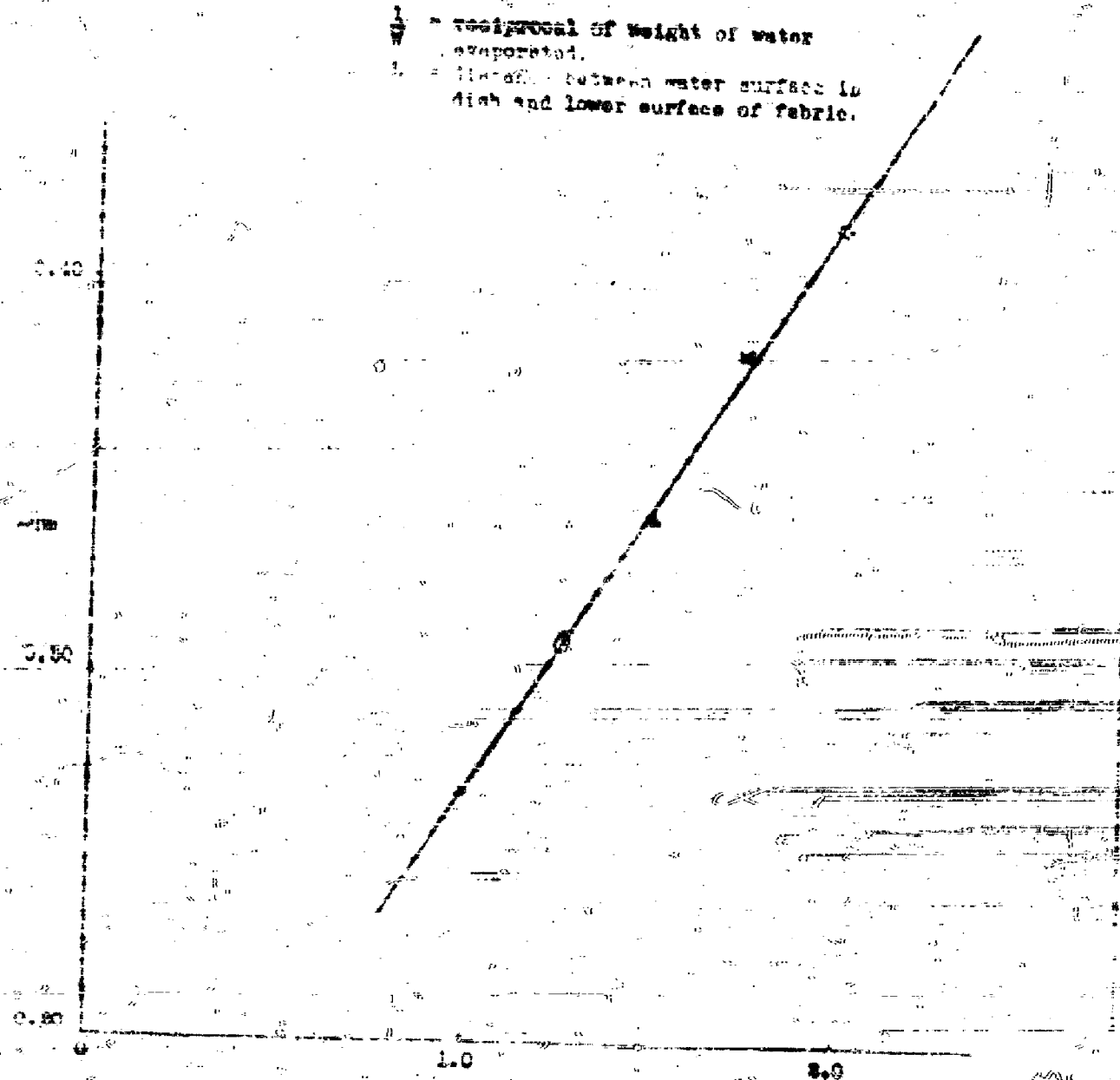
This fact (2555) has facilitated the development of a test method for determining the permeability and analysis of air distribution in clothing.

Test Method

It was considered that any material in contact either with water or with a dehydrating agent was open to objection, since water may seep into the fabric and a granular dehydrating agent is liable to leave air spaces between itself and the fabric. Accordingly, it was decided to use an experimental arrangement in which the material was mounted over a dish containing water and the material was separated from the water by an air space of known thickness. With such an arrangement, resistance to the passage of water vapour is offered by the air space between the water and the fabric, by the fabric itself, and by the air space within the thickness of the fabric. By means of simultaneous measurements of the number of layers of fabric were independently varied, it was found possible to assess separately the resistance of each under conditions such that the resistance of the air above the fabric was held constant; so that it could be cancelled out from the calculation.

When the thickness of the air layer between the water and the fabric was varied, one layer of fabric being used in each case, a rectilinear relation was found between the inverse of the rate of water loss and the thickness of the air space (Figure 10) which is in agreement with the equation already given (page 31). However, for thicknesses of air space of 0.5 cm. or more, this relation no longer held, no doubt because the air was disturbed by convection.

If now a test was carried out as the above, same with any suitable thickness of air space but with two or more layers of fabric, the resistance of the air space would be the same in both cases, and with the additional layers of fabric, the difference in thickness of air space between one and two layers of fabric layer is small, it would be the resistance of the air space which gave the same rate of water loss. The fact that the rate of water loss has been the same in both cases



Graph illustrating method of estimation of resistance to passage of water vapor by diffusion.
 Points marked X were obtained in tests with a single layer of fabric.
 The point represented on the straight line the value of $\frac{1}{W}$ obtained with two layers.

FIGURE 10

appeared that there had been no difference in the results obtained with the two fabrics in the two cases, owing to a different vapor gradient. Although further investigation may well show this presumption to be correct.

In later work it has been found convenient to use sintered glass disc underneath the fabric to support it. According to present procedure, simultaneous tests are carried out with four different thicknesses of air between the water surface and the single sintered glass disc. (The sintered glass discs have all been found to have an equal resistance to the passage of water vapor.) As the tests are carried out, each with one constant air space, a single value is obtained for the comparative procedure to represent the resistance of the fabric. The sintered glass discs do not influence the estimation provided they all have an equal resistance. It was found that it is possible to obtain the necessary result with only three dishes. However, it is not good for a check as to accuracy. In all cases it is necessary that the dishes and their samples be left long enough for a steady state to be set up and for the fabrics to have reached equilibrium in respect of regain moisture with the surrounding atmosphere.

The validity of this test method has been established by comparing the results obtained with standard values obtained from other ways with standard values.

This test method can be applied not only to fabrics but also to many other materials such as lacquers, papers, and sheet plastics. It enables the resistance to be determined of physical units in a manner independent of the type of the dish or other standard condition of the experimental method. In the case of a particular investigation, in the case of highly permeable materials, those characteristic values generally enter into the result. Conversely, in the case of rather impermeable materials, the resistance to the passage of water vapor is low and above the test material becomes relatively small.

Resistance to Water Vapor

Comparative values obtained with a variety of fabrics confirm those of Megaw (1930) in that resistance to the passage of water vapor is in most cases very low. The resistance usually amounts to only 1 or 2 times that of still air. However, for some materials it was found to be as high as about 3 times that of still air.

...concluded by Gregory, that in the case of most of the fabrics used in ordinary clothing, much of the water vapour passes through the fabric themselves as well as through the air spaces.

An investigation was made (2234) of the permeability of various kinds of leather with reference to fat content. It was concluded that leathers of low, high fat content, such as might be regarded as suitable for wet conditions, necessarily have a high resistance to the passage of water vapour. Extraction of the fat from leathers greatly reduces this resistance. Treatment (after extraction) with dubbin increases the resistance, although not necessarily to anywhere near the original level. Results of a test on the upper leather of U.S.A.F. Timberman's Boots is given in Table V.

TABLE V

U.S.A.F. Timberman's Boots (Type B) Upper Leather

Thickness of leather	0.26 cms.
Fat content of original sample (% by weight)	42.2
Permeability of original sample (a) equivalent thickness of ideal still air	33.0 cms.
(b) ratio of resistance to that of air	125.0
Permeability of extracted leather (a) equivalent thickness of ideal still air	0.2 cms.
(b) ratio of resistance to that of air	3.0
Permeability after applying dubbin (a) equivalent thickness of ideal still air	2.2 cms.
(b) ratio of resistance to that of air	14.0

Flash Resistance

...in order to determine to what extent a fabric would give protection against brief exposure to hot flame. Protection was desired against burns such as might occur when a man escaping from a crashed plane. It was assumed that in such circumstances, if his clothing remained intact, parts of his body, at protection would not be burned, but that if his clothing caught fire he would be burned. The test was designed to determine the result of crashes

... have been severely ...
... which ...
... the fabric ...
... and the latter was covered ...
... fabric ... to ignite was

Little time was available for this work, and it was decided that considerable refinements could be made in the method. It was decided that it was desired by the investigators concerned to install a small metal plate and ... the fabric in order that the results might have a closer relation to the nature of temperature. This suggestion was made to the Committee on Protective Equipment and was ... with an investigation of ~~water absorption~~ helmets.

Water Absorption and Rate of Drying of Fabrics

An investigation (D2747) was made of the rate of ... in Figure 1, are illustrated the results got with fabrics ... in relatively still air under controlled conditions of temperature and humidity. The rate of evaporation from saturated fabrics was the same until the amount of water remaining approached that held as regain moisture; then there was a decrease in the rate of drying. Similar results were got in a wind tunnel at various wind velocities up to 4 m.p.h., although of course the actual rate was increased. The rate of drying from a thoroughly wet fabric ... was identical with that from a shallow dish of water exposed to similar atmospheric conditions. The relationship of the rates of drying of thoroughly wet fabric ... has already been reported by workers under the U. S. National Research Council (Frost, Friedman, Cooke and Harris). It may be concluded that thoroughly wet fabric acts like a sheet of water in respect of drying, and that the time taken to dry depends largely on the amount of water held.

... of the amount of water held by various fabrics with maximal retention ... the most ... of the sample in water ... by suspension for a 17

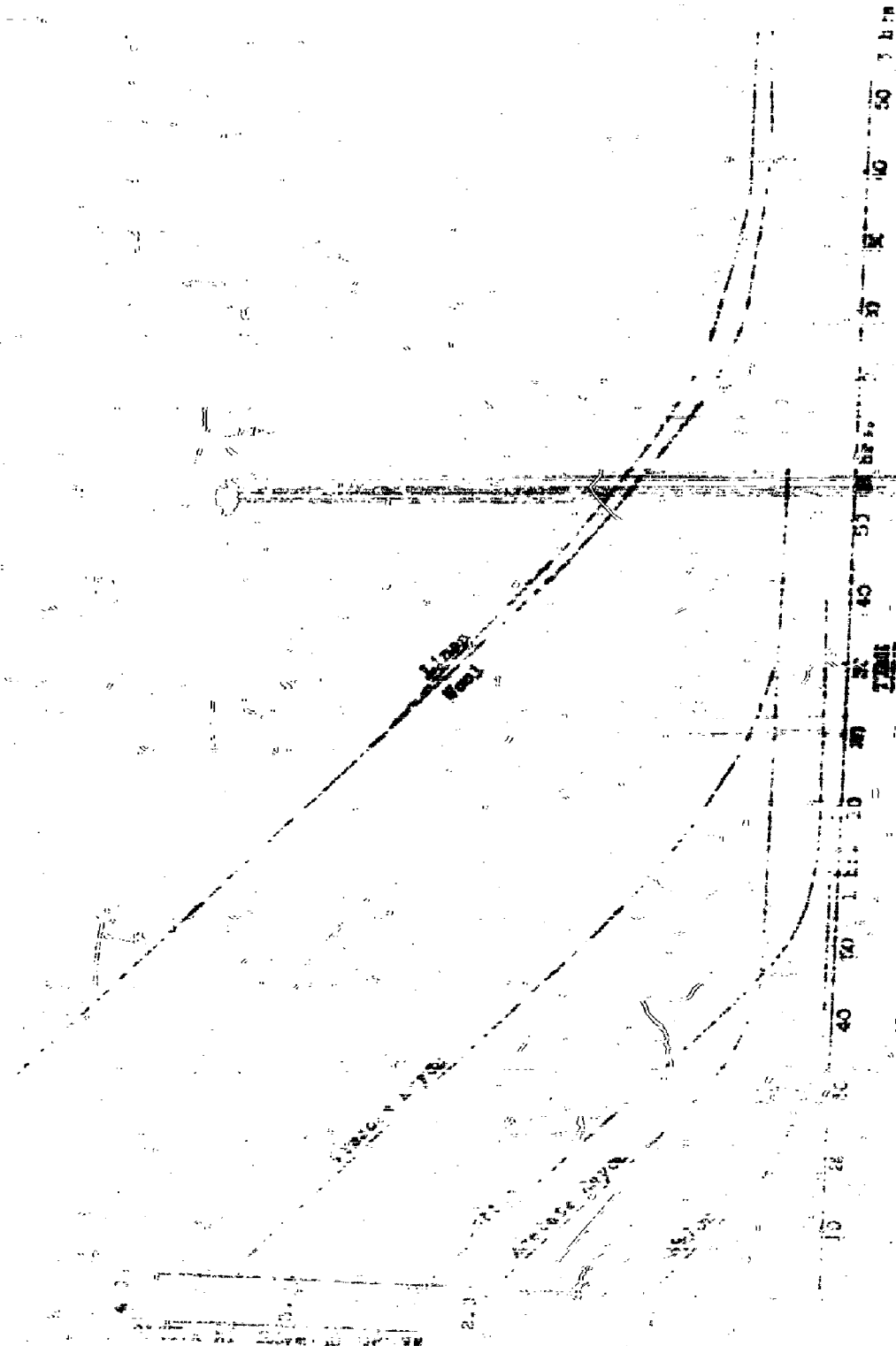
It is reasonable to expect a fairly close correlation between the water held in the air space volume of the fabric and the volume of the fabric less the volume of the water held in the air space. This is perfect, since the thickness of the fabric is not a function of measurement will not usually well represent the thickness of water held in different types of fabric. The correlation is close enough to indicate that the volume of the maximal water holding capacity of different fabrics.

The results of water retention after treatment to remove water are quite strikingly different. The results of treatment were noted -- the difference between absorbent materials under a vacuum and centrifuging. The last method seems the best method for determining the correlation was acceptable either with the dry weight of the fabric or with the weight of water held by glass fabric and nylon fabric was consistently higher than that held by wool, rayon, linen and viscose rayon. Viscose rayon gave intermediate results. After a comparison has been made for regular moisture contained by each fabric, it remains clear that there were differences in the amount of non-retain water held by the various fabrics, and that these differences depended on the type of fabric.

It is reasonable to suppose that the water held in the fabric after centrifuging, most of the remaining water would be associated with the surface of the fibres. The surface area of the fibres in the spaces between the fibres or yarn. According to a calculation was made of the fibre surface areas of the various fabrics, and the thickness of a water film was computed on the assumption that all the non-retain water was evenly spread over the fibres. The calculated film thicknesses were found to range from 0.6 to about 8. However for a given fabric the results are so consistent as could be expected. The lowest value is for glass, with nylon and viscose rayon. It is interesting that the results for rayon are much lower than those for viscose, in spite of the fact that the two types are chemically identical. The viscose fibre is much less smooth in its surface than the rayon fibre, so that the retention of water on the surface of the viscose fibre is too low. The results on the surface may well account for the difference in water held by this material.

11-22-11

Rate of Decay of Warfarin in Water



the present study. The water retention of the material was much lower for a sample of 100% cotton and was covered with the water. The amount of water retained after treatment is dependent upon both the physical and chemical nature of the surface.

The Slipperiness of Lining Fabrics

It is generally accepted that linings of boots and shoes should be slippery in order that the foot may slide readily over underlying clothing, and thus avoid chafing and blisters during wear. The procedure (GMS-22) adopted for measurement of slipperiness was that of a block and the other is a board capable of being tilted to any angle. The angle of inclination of the board at which sliding of the block would occur at approximately uniform velocity was measured, and the coefficient of friction was obtained from the tangent of this angle. The static friction (the force required for sliding to begin) is slightly higher than the sliding friction. One of the advantages of the block method is that it is more convenient from the point of view of measurement. The purpose of this study was to determine the slipperiness of the lining fabrics was approximately 0.4.

An investigation of the sliding angle and coefficient of friction of a number of different appropriate materials was made. It was found that there are considerable differences in some cases the direction of the force is important.

As the standard for lining materials was lacking for the Army Services, the quality is known to vary. It is generally reported to come from Java, and the existence of considerable stocks of Java material in North America. It was considered necessary to

as is popularly known, it is due to the nature of the fibres, it is due

...the air entrapped between the fibres
...has been estimated ... in the cubic root of
...the customary density ... of
...the fibres ...

...even when packed in a fabric container
...which is not ... of

...surface of the fibres ...
...the space between
...the fibres ...
...are individually

...resistance to
...the air
...is not squeezed out by the
...waves on a partially
...life jacket

Agency of Filling Materials

A test method has been developed for the
estimation of the usefulness of filling materials for
... (jackets). For this purpose an acceptable mea-
sure of buoyancy was needed. The buoyant force of a
float or life jacket is measured as the weight in water
... will just support without sinking ... more
... of a weight suspended
... spring balance and ... in water. The fall in
reading on the spring balance when the float is attached
... weight (both being fully submerged) represents the
buoyant force of the float. For a filling material,
... consideration is the buoyant force of a given
... bulk (rather than weight)
... of life jackets.
... buoyancy by the weight
... of a given weight of filler is altogether mis-
leading, ... For instance, a life
... support a weight of 100 lbs. in
... trial cases

...with material
...
...
... is therefore misleading for
... are

... various

the surface of filling material totally immersed in water. The volume of water displaced by this is equal to the bulk density of the filling material.

21000 and buoyancy of a filler is to be measured by the buoyant force on test volume of material, the density of medium must be standardized. The mass of filler which will displace a 1000 volume depends on the density applied. The density of water being the standard, 1000 lbs./cu. ft. The density of air being the standard required to fill 1000 cu. ft. as required by the Department of National Defense for selection in test of filler. This figure represents a standard value in the standard of filler. The density of the medium must be standardized. The density of the filler is to be filled with the filling material to a volume at the standard pressure, and the buoyant force exerted by the submerged material is measured after the material is allowed to settle over a period of twenty-four hours.

As to the possible effect of buffeting
the buoy is rotated for one hour
partially filled with water, and the buoyancy is
checked. The above test has proved

Abstract

... summarized in Cable 111

from the region of the ... the ... of good quality, Bahamas ... kapok are prac-

... (apparently from a different species of tree) ... buoyancy when agitated under water. Unfortunately the supply of Bahamas cottonseed floss is ... is available commercially

In view of the powdering (02346) of the ... kapok in the quilted ('tropical') ... R.C.A. flying suits, a comparative investigation (02347) was made of the fracturing of 'tropical' ... milkseed floss. Although there is no ... that kapok breaks up in life jackets in ... of resistance buoyancy ... that any substitute for kapok in ... kapok fibres was successfully accelerated ... rubber stoppers in a jar. Fracture and ... kapok, although some occurred in ... materials. The loss of buoyancy in 'tropical' was ... to be noted that in the handling of ... air may become filled with dust, against ... protection might be needed.

Tests have also been carried out on a variety ... Of these, geese down ... type that gave satisfactory results. Admixture ... of fibres of these, led to ... buoyancy. Sheep's wool and deer ... also given very unsatisfactory results.

Attempts were made (02348, 02349) to give buoyancy ... of these materials with water- ... was received from the ... of Canada. ... materials had considerable buoyancy ... conditions, they lost most of it when agitated ... kapok and milkseed (02349, 02350). The direct superiority ... may be explained by the fact that a ... of cotton or wool fibres, when ... lose the ... of rigidity of ... in a humid environment, the air entrapped ...

... easily squeezed out during agitation; nor does
 ... with a water-repellent prevent the uptake of
 ... upon which the change of rigidity

TABLE VII

Buoyancy of various vegetable, animal, and synthetic
 fibres

Item No.	Material	Density of packing (lbs./cu.ft.)	Buoyancy (lbs. of flo- tation force per cu.ft. of floating material)		
			After 24 hour	After 24 hours	After further agitation which sample was agitated
Vegetable fibres					
1	new 'Prime Java'	3.0	50	57	13
2	new 'Tania' Super-			57	17
	fine	3.0	58	55	44
4	new 'Tania' Super-				
	lacks found in string				
5	new high	3.0	45	45	9
	quality	2.4	60	66	39
6	new	4.5	57	55	35
	obtained from Bahamas				
	new	3.0	57	55	10
	obtained from Bahamas,				
	all in question for 5 yrs	3.5	57	55	43
	obtained from Trinidad,				
	new	3.3	55	43	7
	obtained from Antigua,				
	new		45	32	4
	new				
	new		53	44	44
	new		50	50	15
10	new duck				
11	new duck	0.4	52	47	waterlogged
12	new duck	0.4	42	15	test discontinued
13	new duck	0.4	40	0	discontinued
14	new duck	0.4	40	0	discontinued
15	new duck	0.4	40	0	discontinued
16	new duck	0.4	40	0	discontinued
17	new duck	0.4	40	0	discontinued
18	new duck	0.4	40	0	discontinued
19	new duck	0.4	40	0	discontinued
20	new duck	0.4	40	0	discontinued
21	new duck	0.4	40	0	discontinued
22	new duck	0.4	40	0	discontinued
23	new duck	0.4	40	0	discontinued
24	new duck	0.4	40	0	discontinued
25	new duck	0.4	40	0	discontinued
26	new duck	0.4	40	0	discontinued
27	new duck	0.4	40	0	discontinued
28	new duck	0.4	40	0	discontinued
29	new duck	0.4	40	0	discontinued
30	new duck	0.4	40	0	discontinued
31	new duck	0.4	40	0	discontinued
32	new duck	0.4	40	0	discontinued
33	new duck	0.4	40	0	discontinued
34	new duck	0.4	40	0	discontinued
35	new duck	0.4	40	0	discontinued
36	new duck	0.4	40	0	discontinued
37	new duck	0.4	40	0	discontinued
38	new duck	0.4	40	0	discontinued
39	new duck	0.4	40	0	discontinued
40	new duck	0.4	40	0	discontinued
41	new duck	0.4	40	0	discontinued
42	new duck	0.4	40	0	discontinued
43	new duck	0.4	40	0	discontinued
44	new duck	0.4	40	0	discontinued
45	new duck	0.4	40	0	discontinued
46	new duck	0.4	40	0	discontinued
47	new duck	0.4	40	0	discontinued
48	new duck	0.4	40	0	discontinued
49	new duck	0.4	40	0	discontinued
50	new duck	0.4	40	0	discontinued
51	new duck	0.4	40	0	discontinued
52	new duck	0.4	40	0	discontinued
53	new duck	0.4	40	0	discontinued
54	new duck	0.4	40	0	discontinued
55	new duck	0.4	40	0	discontinued
56	new duck	0.4	40	0	discontinued
57	new duck	0.4	40	0	discontinued
58	new duck	0.4	40	0	discontinued
59	new duck	0.4	40	0	discontinued
60	new duck	0.4	40	0	discontinued
61	new duck	0.4	40	0	discontinued
62	new duck	0.4	40	0	discontinued
63	new duck	0.4	40	0	discontinued
64	new duck	0.4	40	0	discontinued
65	new duck	0.4	40	0	discontinued
66	new duck	0.4	40	0	discontinued
67	new duck	0.4	40	0	discontinued
68	new duck	0.4	40	0	discontinued
69	new duck	0.4	40	0	discontinued
70	new duck	0.4	40	0	discontinued
71	new duck	0.4	40	0	discontinued
72	new duck	0.4	40	0	discontinued
73	new duck	0.4	40	0	discontinued
74	new duck	0.4	40	0	discontinued
75	new duck	0.4	40	0	discontinued
76	new duck	0.4	40	0	discontinued
77	new duck	0.4	40	0	discontinued
78	new duck	0.4	40	0	discontinued
79	new duck	0.4	40	0	discontinued
80	new duck	0.4	40	0	discontinued
81	new duck	0.4	40	0	discontinued
82	new duck	0.4	40	0	discontinued
83	new duck	0.4	40	0	discontinued
84	new duck	0.4	40	0	discontinued
85	new duck	0.4	40	0	discontinued
86	new duck	0.4	40	0	discontinued
87	new duck	0.4	40	0	discontinued
88	new duck	0.4	40	0	discontinued
89	new duck	0.4	40	0	discontinued
90	new duck	0.4	40	0	discontinued
91	new duck	0.4	40	0	discontinued
92	new duck	0.4	40	0	discontinued
93	new duck	0.4	40	0	discontinued
94	new duck	0.4	40	0	discontinued
95	new duck	0.4	40	0	discontinued
96	new duck	0.4	40	0	discontinued
97	new duck	0.4	40	0	discontinued
98	new duck	0.4	40	0	discontinued
99	new duck	0.4	40	0	discontinued
100	new duck	0.4	40	0	discontinued

		After 1 Hour	After 24 hours	After further hour during which sample was agitated
22.	Subsidiary	28	26	25
		35	36	38

14.4.1. Effect of a high pressure used in packing
 AVERAGE TAKEN AFTER VARIOUS INTERVALS OF TIME.

'Bubblefill', a viscous fibre containing
 the presence of entrapped air, manufactured by E. I. du Pont
 Company, was also tested for buoyancy (08437). Although
 the buoyancy was practically unaffected by the test procedure,
 the initial buoyancy was relatively low. (Table VIII).

TABLE VIII

Material	Packing density (lbs./cu ft.)	Buoyant force after 1 hour of static immersion (lbs./cu ft.)
(2) Kapok	3.0	29.5
(3) Bubblefill	4.1	27.7
		36.2

The buoyancy of 'Bubblefill' depends entirely on the air within
 the fibres or bubbles. The air between them becomes replaced
 with water. At a packing pressure equal to that normally
 used for kapok, 'Bubblefill' has a buoyancy per unit volume
 of 100% of that of kapok (Table VIII, item 2). With tight
 packing, this can be raised to 60% (Table VIII, item 3). Un-
 fortunately economy of volume is an important consideration
 in design of life jackets. In addition 'Bubblefill' was
 found to break down readily when agitated with dry. Exper-
 tence with 'Bubblefill' in flying suits will indicate the
 need for caution in the choice of such a material.

Of the possible substitutes for kapok so far
 known, 'Bubblefill' appears to be by far the most promising.
 However, floss is as good as kapok. Life jackets,
 some containing kapok and others milkweed floss, have been
 used for years. This comparison should go far
 to show that 'Bubblefill' is a suitable substitute for kapok.

40
COMMITTEE ON THE PHYSIOLOGICAL PROTECTION

Historical

In the early days of the Subcommittee and before its formation, the protection of flying personnel against cold was a problem. The early work was devoted to the evaluation of clothing for this purpose. An extensive analysis was made of the heat exchange through clothing under cold environmental temperatures (C24066). The insulation of clothing was estimated and the consideration of the rate of loss of body heat through it and was expressed as a new method of measuring the thermal insulation of clothing on an artificial man was also developed (C24067). Various flying suits were tested by these two methods and the results provided a basis for the design of a winter flying suit (C24068). With these methods of measuring the thermal insulation of clothing have been used extensively in various laboratories. An investigation was also made of the effect of wind on the thermal insulation of clothing (C24069). The results of these tests showed that the thermal insulation of clothing was not affected by wind.

Results of the N.C.A.F. Flying Clothing Committee's questionnaire on flying clothing had shown the popularity of bulky flying clothing. On the other hand it was recognized by the Subcommittee that the thermal insulation and the comfort insulation are inseparable (see page 26). It was therefore necessary to design clothing having the greatest possible thickness but causing the wearer the least possible sensation of bulkiness. For this purpose it was clear that clothing should be designed in such a way as not to cause any restriction of movement on the wearer (C24066). Flying clothes were designed with the wearer in a typical position of rest (C24070) and the same principle was applied to the design of the winter flying suit (C24071). An investigation was also made of the areas of the clothing where pressure was applied, to be developed (C24072, C24073). It was found that the thermal insulation of the clothing by compression of the fabric or pressure on the body was not a factor which would restrict the performance of the wearer. When it was found that the flying clothes were in general small, emphasis was placed on the design of the clothing which would retain its shape after such temporary but repeated compression as was likely to be experienced in service use. The results of these tests on men wearing winter flying clothing as to the effect of the load, most likely to a

it seems unfortunate that no attempt was made to investigate this possibility.

It was generally recognized by the Subcommittee that the exchange of moisture between the body and the outside air was likely to be greatly affected by the nature of the clothing worn. The exchange of moisture from the skin to the outside air was frequently observed in the U.S. Army, Alaskan Expedition (1942) draw attention to the problem of the accumulation of moisture in the clothing. In experiments in the cold room this was frequently observed when a rubberized coverall was used. Information obtained from the U.S. Army (1940) showed that men experienced in outdoor construction and logging work in very wet conditions had expressed the view that the outer clothing must not be impermeable to water vapour. A similar opinion was received from men working in dry cold conditions on the North West Frontier (Simons, 1941). In view of these general field observations discussed above, a test method for measuring the vapour permeability (1945). The resistance of a fabric or other material was estimated in terms of the thickness of a layer of still air having an equal resistance. With this information it was possible to obtain a simple theoretical distribution of the distribution of water vapour in clothing (after achievement of a steady state) with known external and internal environmental conditions. Experimental results are in accord with these observations.

Work on tropical clothing was limited to certain special problems in view of the small number of investigations available. The theoretical analysis of heat exchange first made in connection with cold conditions was extended to include the effect of the solar radiation and of evaporation of sweat (1945). Values were derived to represent solar heat load and the heat stress on a man under tropical conditions and the effect of the thickness of clothing.

Thermal Insulation of Ambient Air

General Consideration; and Effect of Air Movement

It is generally accepted that the exchange of heat between the surface of a man's clothing to the outside air (except of course under conditions of extreme heat) is other words, the air surrounding a man has an insulating effect. Loss of heat by convection of air

clothing (or from the bare skin) takes place partly by conduction and partly by convection (see page 18). The convection is dependent on the air movement and the function of the emissivity of the surface of the body. When the thermal insulation of the air is constant when the thickness of the air exceeds a certain value (see p. 22). The thermal insulation of the air, therefore, has a certain definite and characteristic value, dependent on the degree of air movement. The results obtained by Winslow, Gage and Harrison (1930) are reproduced in Table IX.

TABLE IX.

Thermal insulation of air at all temperatures

	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
Thermal insulation	3.27	2.19	1.60	1.39	1.37	0.95	0.97	0.40	0.34
Wind velocity	4,500	2,000	1,000	425	210	120	75	50	30
Wind velocity	3,200	1,000	400	210	100	61	38	25	15

The insulation of air is constant when the wind velocity is 47. These results can also be expressed by the equation $I_A = \frac{1}{0.51 + 0.19/V}$

where the term 0.51 represents the radiation and the term $0.19/V$ represents the convection which is dependent on the velocity of air movement (V is expressed in cms./sec.). The velocity of the air ranges from 0.1 to 10.0 m/s. The change of insulation with change of wind velocity is shown in Table IX. The values given apply to men in a 'semi-reclining' position. The effect of posture on the insulation of the ambient air is not known.

Consideration was given to the question as to whether the thermal insulation of the air could justifiably be assigned standard values for different degrees of air movement and for the temperature. For the purpose of the present experiment, in actual practice this procedure was not followed. The insulation of air depends on the degree of air movement (the gradient of temperature) and on the radiation decreases, but loss by convection increases;

These two factors counterbalance one another in such a way that the net effect is negligible.

Effect of Curvature on Heat Loss

The values given above are applicable to the case of a sphere. However, in the case of the thermal insulation of the body, the surface of the body, having a certain curvature, the effect of curvature has to be taken into account. The effect of curvature on the thermal insulation of a surrounding fabric layer has already been explained by Dr. Dilla. It is a well known fact that heat passes from the surface of the cylinder or sphere through a layer of fabric wrapped around it, the surface area across which the heat is passing increases as the distance increases through the fabric. Obviously, the greater the curvature the greater is the effect.

Application of this principle to thermal insulation of the outside air, which may be regarded as a layer surrounding the surface of the body, has shown that the correction to be applied becomes significant in the case of parts of the body as small as the finger. This is discussed further under 'gloves' on page 22.

Effect of Altitude

At high altitudes the loss of heat from the body by convection will be less owing to reduction in the density of the air. The effect can be calculated from the equation already given (page 21) by adjustment of the term representing convective loss.

(0.19 becomes 0.19 density of air at ground level).
The density of air under very still conditions (0.0012) would be about 1.1 G10 at 34,000 feet although only 0.85 G10 at sea level. For greater degrees of air movement the correction is less.

Effect of Wind on a Clotned Man

For a man wearing an H.C.A.F. winter flying suit the insulation of the air amounts only to about 15% of the total insulation of the man. Therefore any loss produced by air movement can only amount to quite a small fraction of the total (so long as the wind does not penetrate the clothing). On the other hand, the cooling effect of wind on the bare face is very marked, because the whole of the insulation is in the surrounding air, and may drop by as much as 50% in conditions of intermediate and the wind is completely without effect.

Insulation Needed for Comfort

Thermal insulation needed to maintain a body temperature of 37°C without change of body temp. has been calculated for various activities and at various ambient temperatures. It has been predicted (22033) from the results of the above calculations that the insulation needed for comfort is consistently verified in the work reported out in the last issue. For example, of the insulation of protection we must start with the knowledge that a total of 1.0 clo (1.0 clo is the clothing and 0.7 clo is the insulation of the body) is sufficient to keep a sitting man at a temperature gradient between the room (21°C) of 12°C. For a man lying as sleep, that is for a temperature of 18°C, the total insulation must be 1.5 clo. The man remains comfortable in the room so that if a flying suit worn over R.C.A.F. winter uniform (1.0 clo) under conditions of 18°C, the insulation of the suit must have a thermal insulation of 0.5 clo.

The total insulation necessary under various conditions of environmental temperature and metabolism, has been derived for the purpose of calculation, in the fundamental equation of heat balance shown on page 10. The average body temperature under comfortable conditions has been taken as 37°C, the evaporative heat loss as one of the metabolic heat, and the rates of heat production and heat loss of the body as equal, so that no cooling of the tissues takes place. The following conclusions may be drawn from the

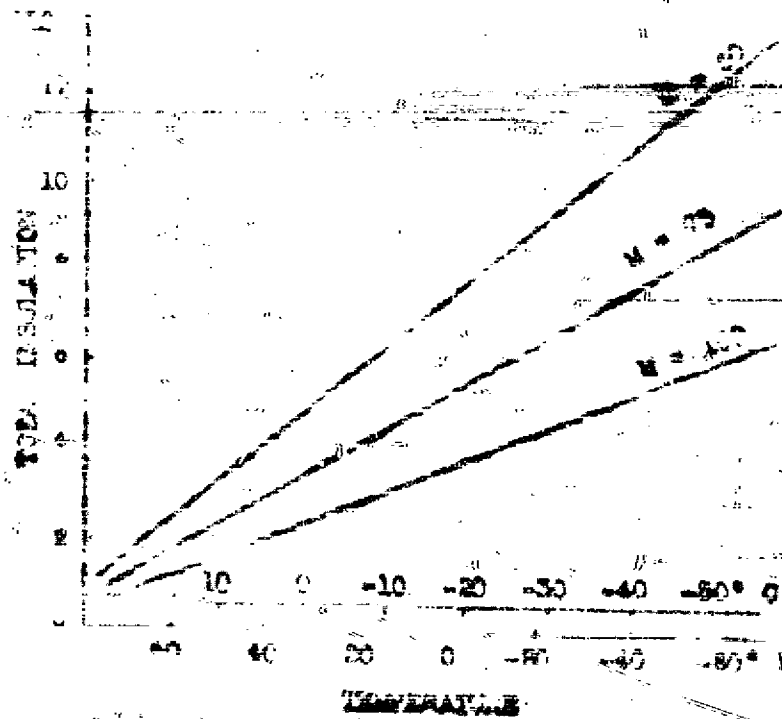
1) The comfortable temperature for a man wearing a heavy flying suit (R.C.A.F. flying suit, Type 1, winter type, with coverall, 2.7 clo) is around freezing point.

2) A man (with extra heating) to dress a man in a flying suit to enable him to sit comfortably for prolonged periods at temperatures around 0°C (-15°C) without impossible bulky clothing. It should be shown later, for the heat balance of the suit, that a thickness of 1.0 clo is required to keep the man comfortable. This is not less than 1.0 clo.

FIGURE 12

TOTAL INSULATION REQUIRED FOR COMFORT
UNDER VARIOUS CONDITIONS OF ACTIVITY
AND OF ENVIRONMENTAL TEMPERATURE.

(TAKES INTO ACCOUNT THE LIMITS OF AIR AS WELL AS OF CLOTHING)



...also requires, which is also needed, for
rested, with double the metabolic rate of a
man, or in walking at 2 m.p.h. the total
... ..

... .. for shorter periods
... .. through the insulation of the clothing is

... .. for comfort at any given environment
... .. by convection. This is especially
true since a very large part of the transfer of heat
through clothes is done by convection.

... .. the
... .. at ground level, and the insulation of the
... .. (see page 44)
... ..
... ..
... ..
... ..
... ..

... .. of the thermal insulation
... ..
... ..
... .. of chill. However,
... .. with

... .. of

HOWEVER, ALL THIS BEAL IS NOT

BEAL IS FOLLOWING

BEAL IS FOLLOWING

BEAL IS FOLLOWING

BEAL IS FOLLOWING

BEAL IS FOLLOWING

BEAL IS FOLLOWING

BEAL IS FOLLOWING

BEAL IS FOLLOWING

BEAL IS FOLLOWING

BEAL IS FOLLOWING

BEAL IS FOLLOWING

BEAL IS FOLLOWING

and a ...
...
...

... 3.4
... and ... cover

... method is by
... This consists of a
hollow model of a man which can be dressed in the flying
suit ...
into the warmed air ...
a thorough circulation of heat. The heater is controlled
by a thermostat within the model, which ...

... on during a ...
... has been set to maintain body temperature ...

...
... this is not essential provided that the temperature
difference between the model and the room is large. The
total insulation is equal to the temperature difference
divided by the metabolic rate per unit area of the
model. Since the temperature of the inside of the suit
is used and not the skin temperature, the insulation
is much greater than that provided by the suit
of the model. Allowance is made for ... and ...
insulation in a blank experiment on the naked model.

Results obtained with the artificial man are
consistent with those not by the analysis of heat balance

...
... at a temper-
... the correct temperature for the clothing
...
... of body temperature ...

Thus, the fraction of the

vapour passes out as such to the outside air, then practically all the water that is absorbed will be drawn from the

condensation, and re-evaporation efficiency of evaporation. The

Accordingly the basic equation of heat exchange given on page 50 can be modified to take account of solar radiation and of evaporation of sweat as follows:

3. evaporative heat loss from inskin in Calo /sq. m. /hr.

...and the fact that the ...

1. The first group of people who are interested in the results of the study are the researchers themselves. They want to know if the study was successful in achieving its goals and if the data collected is reliable and valid. They also want to know if the study has contributed to the field of research and if it has provided any new insights or findings.

1. The first step in the process is to identify the problem or issue that needs to be addressed. This involves gathering information and understanding the context of the situation.

...ment of the man, expressed in filo-

— *Adapted from the 1997 National Longitudinal Study of the Adolescent Health*

1954-1955

1. The first step is to identify the problem or question that needs to be answered. This involves understanding the context and the specific requirements of the task.

change in the value of ΔH can be calculated as an adjustment to the environmental air temperature (T_{amb}). This can be demonstrated by rearrangement of the equation given immediately above to:

... ..

Figure 1. (A) Schematic representation of the experimental design. (B) Schematic representation of the experimental design. (C) Schematic representation of the experimental design.

and is independent of the clothing worn. Values for the

... solar radiation absorbed at the surface

the clothing are given in Figure 11. From the figures given by Blum (1945) it appears that for an erect man the clothing load should be at the limit of the 100%.

... 100 Kilometers ...
... the water surface per hour with a ...
... with olive green clothing ...
... to transform ...

conditions on the sun the appropriate increment to the experimental temperature may even exceed thirty Fahrenheit degrees.

various criteria have been suggested for the
imposed on a man in given clothing under

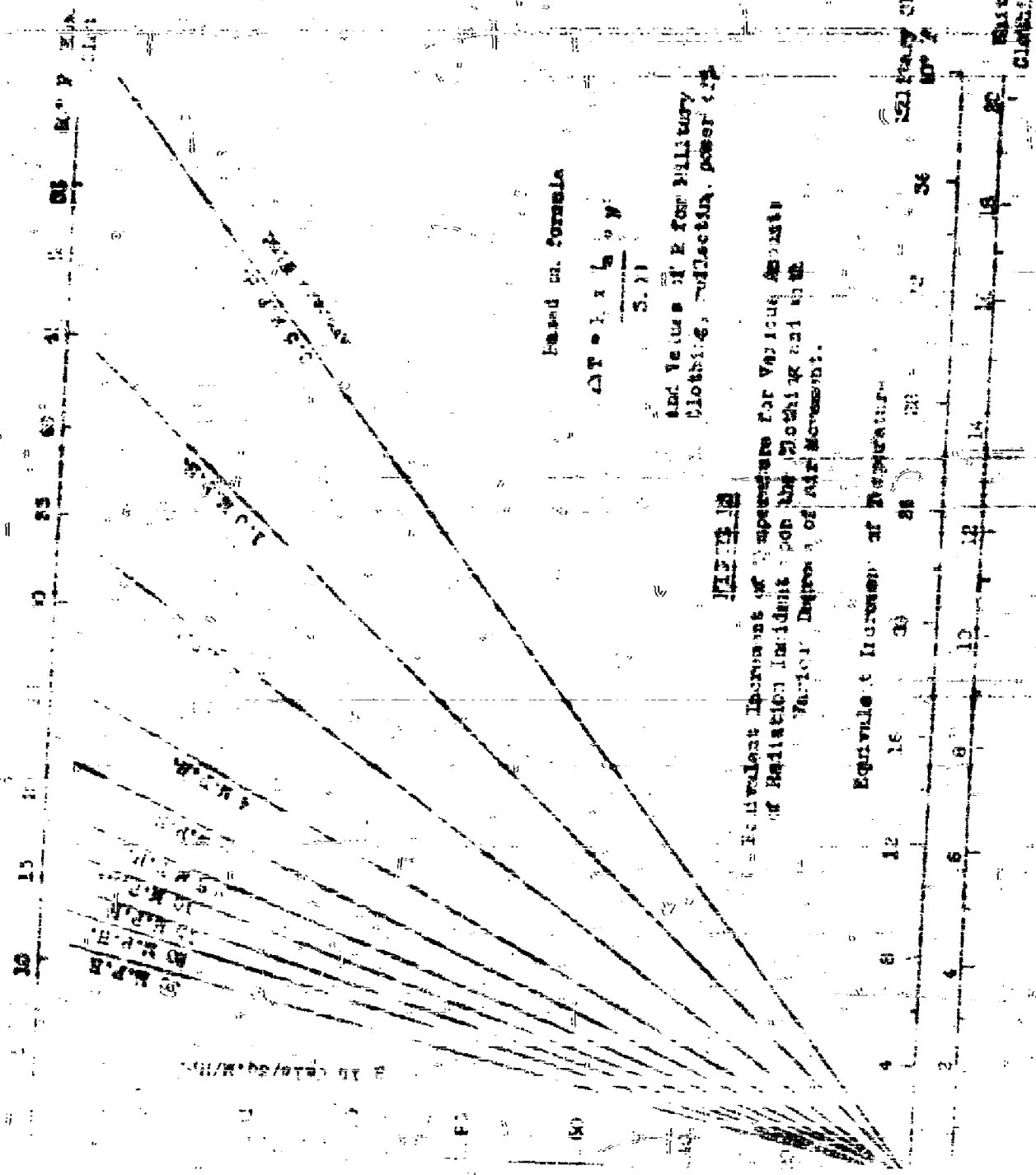
1. The first step in the process of identifying a problem is to recognize that a problem exists. This involves gathering information about the situation and identifying the specific issue that needs to be addressed.

ALL INFORMATION CONTAINED HEREIN IS UNCLASSIFIED
DATE 08-14-2010 BY 60322 UCBAW/SJS

1. 凡在本市行政区域内从事生产、经营活动的单位和个人，均应当依照本办法的规定，依法缴纳地方教育附加。
 2. 地方教育附加的征收，应当遵循依法、公平、公开、透明的原则，不得随意减免。
 3. 地方教育附加的征收，应当纳入地方教育附加专户管理，专款专用，不得挪作他用。
 4. 地方教育附加的征收，应当接受财政、税务、审计等部门的监督检查。
 5. 违反本办法规定的单位和个人，将依法予以处罚。

1. The first step in the process is to identify the problem or issue that needs to be addressed. This involves gathering information and understanding the context of the problem.

100-443887-100



... of the experimental conditions and ... was predicted that ... would increase ... metabolic rate or by ... without change in ... This is ... by the evaporative loss necessary to maintain a steady state, and effect of extra clothing will depend on whether the environmental temperature exceeds the critical temperature ... of the body. ... of thermal insulation is beneficial above the critical environmental temperature, since it reduces the inflow of heat. At low temperatures the addition of thermal insulation adds to the heat stress.

Distribution of Moisture in Clothing

... investigation was made of the distribution of moisture in the clothing of men sitting or ... were cotton vest, cotton shirt, wool bathdress and cotton ... of the material were removed after suit ... over the shoulder blades. The relative humidity in equilibrium with the patches was ... of the patches (suction) ... by means of thermocouples. The vapour pressure in equilibrium with the patches was estimated from the relative humidity and the temperature. ... of the relative humidity or vapour pressure at equilibrium within the clothing which ... state has been attained in respect to the thermal and vapour gradients.

... at low temperatures it was possible for the subjects to exercise fairly strenuously without sweating. This of course is in accordance with ... observations. At low temperatures the vapour pressure of the skin was very low. During part of an experiment it was around 2.5 mm Hg. This is to be expected. A detailed consideration of the gradient of ... between the skin and the outside. The wetted area (W) of the skin was described by Gage as that proportion of the total area of the skin which if completely wetted ... rate of evaporation.

Relative

Relative

Relative

Relative

Date of experiment 8.1.49.
 Subject - Thompson, 112 lbs., sitting
 clothing previously transferred from 75-80° F.H.
 to 80° H.H. at 21°C. dry bulb, and acclimated

- ① — 1st min.
- △ — 200 min.
- — control samples taken at start of experiment.

Pressure

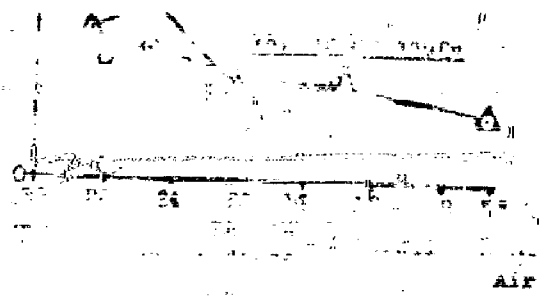


FIGURE 4

Distribution of Moisture in Clothing.

Relative
Humidity

Relative
Humidity

Date of experiment - 13.VI.49.
Subject - Musprizes, 112 lbs.,
weight - 3.1 m.o.h.

Clothing previously transferred from dry
acclimation at 60° F.H., 54° C.,
dry bulb. Room at 41° C.

180 min.
180 min.
Control samples taken
at start of experiment.

Relative
Humidity

Relative Humidity

24 20 16 12 8 4 0 -4 -8 -12 -16

Room
Air

FIGURE 15

MEASUREMENTS IN CLOTHING.

Measured
man

Date of experiment - 30. IV. 45.
Subject - Parker, 150 lbs.,
swimming at 3.4 m.p.h.

Swimming previously conditioned at 21° C.
500 M.M. Room at -4° C., 500 B.H.

90 min.

180 min.

Relative Humidity

Relative Humidity
100%

Pressure

Vacuum Pressure

First Reading

Second Reading

Time
min.

...on condition during
...and consequently the
...the subject was
...in service wear

...in full flying clothing, was seated on a special seat
with his feet resting on the floor. A small rubber bar
...connected to an air inlet...
...At a given air flow...
...was increased until the point was reached at which the bar
...fell off... and the manometric pressure at that
point was taken to be that imposed on the bag. In order
to determine accurately this point of divulsion in rate
...the drum was then spun back to the starting
...the second transposition
...the apparatus was carefully checked with known loads

...the very restricted area...
...only to 3 lbs...
...Compressor loads on the back
...and under the
...holding a pencil or other object

...EXPERIMENT

RECEIVEDS AND THE ...

14-00000

summer flying season. The development of a
- 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 -<

THE NATIONAL ASSOCIATION OF REALTORS

THE UNIVERSITY OF CHICAGO PRESS

[illegible]

$\frac{1}{\sqrt{\pi}} \int_{-\infty}^{\infty} f(x) e^{-x^2} dx = \frac{1}{\sqrt{\pi}} \int_{-\infty}^{\infty} f(x) e^{-x^2} dx$

100-443887-100

1. The first step in the process is to identify the problem or issue that needs to be addressed. This involves gathering information and understanding the context of the problem.

Ergonomics, 2016; Vol. 59, No. 8, 1079–1090, ISSN 0014-0139 print/ISSN 1366-5847 online © 2016 Taylor & Francis
DOI: 10.1080/00140139.2016.1190000 http://www.tandfonline.com

1. The first step in the process of the investigation is the identification of the problem. This is done by the investigator who is responsible for the study. The investigator must first identify the problem that is being studied. This is done by the investigator who is responsible for the study. The investigator must first identify the problem that is being studied.

11

Journal of Management Education 36(7) 809–824

.....

1. The first step in the process is to identify the problem or issue that needs to be addressed. This involves gathering information and understanding the context of the problem.

— **THESE** continued on the top of page 2.

U.S. DEPARTMENT OF AGRICULTURE

1. 1990年12月15日，在北京市召开的“中国城市经济体制改革十年回顾”会议上，江泽民同志在讲话中，第一次提出“建立社会主义市场经济体制”的命题。

SECRET

..... 7-1-2010

ALL INFORMATION CONTAINED HEREIN IS UNCLASSIFIED

The above information is being furnished to you for your information and is not to be used for any other purpose.

$\frac{d}{dt} \left(\frac{1}{\rho} \right) = - \frac{1}{\rho^2} \frac{d\rho}{dt}$

On the other hand, the β -phase is not stable in the $\text{Fe}-\text{Fe}_3\text{C}$ system, and the β -phase is not observed in the $\text{Fe}-\text{Fe}_3\text{C}$ system. The β -phase is not observed in the $\text{Fe}-\text{Fe}_3\text{C}$ system.

UNITED STATES DEPARTMENT OF AGRICULTURE

1. The first group of people who are not allowed to enter the country are those who are not citizens of the United States. This group includes all foreign-born individuals, regardless of their legal status in the country.

1945 4 2

Figure 1. A schematic diagram of the experimental setup. The subject is seated in a chair, viewing a screen displaying a target (a red dot) and a starting point (a green dot). The subject's hand is positioned at the starting point, and the target is located at a distance of 10 cm from the starting point. The subject is instructed to move their hand from the starting point to the target. The screen is divided into two regions: a starting region (green) and a target region (red). The subject's hand is positioned at the starting point, and the target is located at a distance of 10 cm from the starting point. The subject is instructed to move their hand from the starting point to the target.

11

11

... ..

...and the fact that the *Journal of Management Studies* is a leading journal in the field of management studies, it is a great honor to be asked to contribute to this special issue. I hope that the following review will be helpful to the readers of the *Journal of Management Studies*.

η

μ_i

...the intensity of the ... increase ...

...in a ...

...the car ...

...the ...

...the ...

...the ...

...the ...

...the ...

...the ...

...the ...

...the ...

...the ...



Fig. 17. Flying helmet Type C and flying goggles Type B, together with intercommunication and oxygen installation.



Fig. 18. Man's helmet and Dominion Goggles Company's flying goggles.

...at each side
...the ...
...with the ...
...of elastic and webbing
...a completely elastic suspension ...
...conflicting criticisms on that point
...field testings

...tests showed the ...
...logging button ...
...at Camp Borden ...
...Type D ...
...pockets which ...
...receivers ...

The ... was ... in June, 1944. No
case would be of value in promotion ...
...in ...
...An ... was ... to ...

In the summer of 1944, comparative field
trials were held of the ... and that manufactured
by the Dominion Goggles Company (associated with
American Goggles Corp.). The latter goggles ...
...to ... flange to improve the fit
... (Figure 10). ... preferred it very
much to the ... chief complaints of the latter

- (4) ...
- (5) ...
- ... on landing.
- ... while landing with hood

It was therefore recommended that ...
... to replacing the present
... Dominion Goggles Company's Type 3.0 or
... the Type 3 goggles and adopted the Dominion

... illustrates a development in which excellent
... was made but in which further progress
... firm with for greater facilities for

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, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 26

[illegible]

Current knowledge suggested that the solution against cold stress for a serious problem for military aviation. Accordingly, the physiological and physical testing of the thermal insulation of flying suits was conducted (see pages 10-51). A number of different types of flying suits were compared and it was shown that none of them provided an adequate insulation to prevent a man working fully at the low temperatures prevalent at high altitudes. The experimental flying suits tested during the early part of 1942, and later with genuine silk wool fabric and the highest thermal insulation (Type A), accordingly, as modified to Type B having a heavier insulation, and the suit was issued to flying personnel in limited quantities by the

[illegible]

The Type 2 flying suit (which is a one-piece suit) is made of a heavy, durable material and is designed to fit loosely over the body. It is fastened by a series of overlapping straps which are attached to the body by means of a series of loops. The suit is designed to be worn over a flight suit and is intended to provide protection against fire and other hazards. The suit is made of a heavy, durable material and is designed to fit loosely over the body. It is fastened by a series of overlapping straps which are attached to the body by means of a series of loops. The suit is designed to be worn over a flight suit and is intended to provide protection against fire and other hazards.

The Type 2 suit consists of a one-piece suit, made of a heavy, durable material, lined with a quality cotton. The suit is designed to fit loosely over the body. It is fastened by a series of overlapping straps which are attached to the body by means of a series of loops. The suit is designed to be worn over a flight suit and is intended to provide protection against fire and other hazards. The suit is made of a heavy, durable material and is designed to fit loosely over the body. It is fastened by a series of overlapping straps which are attached to the body by means of a series of loops. The suit is designed to be worn over a flight suit and is intended to provide protection against fire and other hazards.

The Type 2 flying suit was recommended in 1942 and was adopted for use by the R.C.A.F. The suit was designed to provide protection against fire and other hazards. The suit is made of a heavy, durable material and is designed to fit loosely over the body. It is fastened by a series of overlapping straps which are attached to the body by means of a series of loops. The suit is designed to be worn over a flight suit and is intended to provide protection against fire and other hazards. The suit is made of a heavy, durable material and is designed to fit loosely over the body. It is fastened by a series of overlapping straps which are attached to the body by means of a series of loops. The suit is designed to be worn over a flight suit and is intended to provide protection against fire and other hazards.

The Type 2 flying suit was recommended in 1942 and was adopted for use by the R.C.A.F. The suit was designed to provide protection against fire and other hazards. The suit is made of a heavy, durable material and is designed to fit loosely over the body. It is fastened by a series of overlapping straps which are attached to the body by means of a series of loops. The suit is designed to be worn over a flight suit and is intended to provide protection against fire and other hazards. The suit is made of a heavy, durable material and is designed to fit loosely over the body. It is fastened by a series of overlapping straps which are attached to the body by means of a series of loops. The suit is designed to be worn over a flight suit and is intended to provide protection against fire and other hazards.



**Fig. 19. Winter flying suit,
Type B, mesh helmet and
Dominion Goggles Company's
flying goggles, flying boots
Type A, winter flying gloves
Type B.**

The General Population of the State of California

SECRET

[illegible]

that considerable security might be obtained in such a case. The material might be

... in relation to service needs. At ... all permeability below ... for a differential air pressure corresponding to a loss of water was of little benefit ... velocity was low. On the other hand, with ... the permeability to air becomes ... (see page 21). Unfortunately there is no negative information available as to the ad-
 movement of various positions in aircraft used in the ...
 ... a simple instrument is available for

... three groups:

- (1) cotton w/ shell
- (2) ...
- (3) heavy w/ and cotton w/ w/ shell w/ ...

The first group is represented by ... the second by a range of fabrics designed by the United States Office of the Quartermaster General, and by a similar British fabric known as "Canada"; the third group ...
 ... carried out in collaboration with Arcaut Limited, St.

... results obtained in the ...
 ... of fabric is given in Table XI ...
 ... of fabrics of group (iii) would reduce the weight of the type 3 flying suit

... as light as ... so that it is one of ...
 ... for a slippery

of about 16 lbs

TABLE XI

U.S. M.C. U.S. A.M.C.		Canadian English	
Weight	Weight	Weight	Weight
30 34	30 40	30 35	30 34
34 38	34 42	34 39	34 38
38 42	38 46	38 43	38 42
42 46	42 50	42 47	42 46
46 50	46 54	46 51	46 50
50 54	50 58	50 55	50 54
54 58	54 62	54 59	54 58
58 62	58 66	58 63	58 62
62 66	62 70	62 67	62 66
66 70	66 74	66 71	66 70
70 74	70 78	70 75	70 74
74 78	74 82	74 79	74 78
78 82	78 86	78 83	78 82
82 86	82 90	82 87	82 86
86 90	86 94	86 91	86 90
90 94	90 98	90 95	90 94
94 98	94 102	94 99	94 98
98 102	98 106	98 103	98 102
102 106	102 110	102 107	102 106
106 110	106 114	106 111	106 110
110 114	110 118	110 115	110 114
114 118	114 122	114 119	114 118
118 122	118 126	118 123	118 122
122 126	122 130	122 127	122 126
126 130	126 134	126 131	126 130
130 134	130 138	130 135	130 134
134 138	134 142	134 139	134 138
138 142	138 146	138 143	138 142
142 146	142 150	142 147	142 146
146 150	146 154	146 151	146 150
150 154	150 158	150 155	150 154
154 158	154 162	154 159	154 158
158 162	158 166	158 163	158 162
162 166	162 170	162 167	162 166
166 170	166 174	166 171	166 170
170 174	170 178	170 175	170 174
174 178	174 182	174 179	174 178
178 182	178 186	178 183	178 182
182 186	182 190	182 187	182 186
186 190	186 194	186 191	186 190
190 194	190 198	190 195	190 194
194 198	194 202	194 199	194 198
198 202	198 206	198 203	198 202
202 206	202 210	202 207	202 206
206 210	206 214	206 211	206 210
210 214	210 218	210 215	210 214
214 218	214 222	214 219	214 218
218 222	218 226	218 223	218 222
222 226	222 230	222 227	222 226
226 230	226 234	226 231	226 230
230 234	230 238	230 235	230 234
234 238	234 242	234 239	234 238
238 242	238 246	238 243	238 242
242 246	242 250	242 247	242 246
246 250	246 254	246 251	246 250
250 254	250 258	250 255	250 254
254 258	254 262	254 259	254 258
258 262	258 266	258 263	258 262
262 266	262 270	262 267	262 266
266 270	266 274	266 271	266 270
270 274	270 278	270 275	270 274
274 278	274 282	274 279	274 278
278 282	278 286	278 283	278 282
282 286	282 290	282 287	282 286
286 290	286 294	286 291	286 290
290 294	290 298	290 295	290 294
294 298	294 302	294 299	294 298
298 302	298 306	298 303	298 302
302 306	302 310	302 307	302 306
306 310	306 314	306 311	306 310
310 314	310 318	310 315	310 314
314 318	314 322	314 319	314 318
318 322	318 326	318 323	318 322
322 326	322 330	322 327	322 326
326 330	326 334	326 331	326 330
330 334	330 338	330 335	330 334
334 338	334 342	334 339	334 338
338 342	338 346	338 343	338 342
342 346	342 350	342 347	342 346
346 350	346 354	346 351	346 350
350 354	350 358	350 355	350 354
354 358	354 362	354 359	354 358
358 362	358 366	358 363	358 362
362 366	362 370	362 367	362 366
366 370	366 374	366 371	366 370
370 374	370 378	370 375	370 374
374 378	374 382	374 379	374 378
378 382	378 386	378 383	378 382
382 386	382 390	382 387	382 386
386 390	386 394	386 391	386 390
390 394	390 398	390 395	390 394
394 398	394 402	394 399	394 398
398 402	398 406	398 403	398 402
402 406	402 410	402 407	402 406
406 410	406 414	406 411	406 410
410 414	410 418	410 415	410 414
414 418	414 422	414 419	414 418
418 422	418 426	418 423	418 422
422 426	422 430	422 427	422 426
426 430	426 434	426 431	426 430
430 434	430 438	430 435	430 434
434 438	434 442	434 439	434 438
438 442	438 446	438 443	438 442
442 446	442 450	442 447	442 446
446 450	446 454	446 451	446 450
450 454	450 458	450 455	450 454
454 458	454 462	454 459	454 458
458 462	458 466	458 463	458 462
462 466	462 470	462 467	462 466
466 470	466 474	466 471	466 470
470 474	470 478	470 475	470 474
474 478	474 482	474 479	474 478
478 482	478 486	478 483	478 482
482 486	482 490	482 487	482 486
486 490	486 494	486 491	486 490
490 494	490 498	490 495	490 494
494 498	494 502	494 499	494 498
498 502	498 506	498 503	498 502
502 506	502 510	502 507	502 506
506 510	506 514	506 511	506 510
510 514	510 518	510 515	510 514
514 518	514 522	514 519	514 518
518 522	518 526	518 523	518 522
522 526	522 530	522 527	522 526
526 530	526 534	526 531	526 530
530 534	530 538	530 535	530 534
534 538	534 542	534 539	534 538
538 542	538 546	538 543	538 542
542 546	542 550	542 547	542 546
546 550	546 554	546 551	546 550
550 554	550 558	550 555	550 554
554 558	554 562	554 559	554 558
558 562	558 566	558 563	558 562
562 566	562 570	562 567	562 566
566 570	566 574	566 571	566 570
570 574	570 578	570 575	570 574
574 578	574 582	574 579	574 578
578 582	578 586	578 583	578 582
582 586	582 590	582 587	582 586
586 590	586 594	586 591	586 590
590 594	590 598	590 595	590 594
594 598	594 602	594 599	594 598
598 602	598 606	598 603	598 602
602 606	602 610	602 607	602 606
606 610	606 614	606 611	606 610
610 614	610 618	610 615	610 614
614 618	614 622	614 619	614 618
618 622	618 626	618 623	618 622
622 626	622 630	622 627	622 626
626 630	626 634	626 631	626 630
630 634	630 638	630 635	630 634
634 638	634 642	634 639	634 638
638 642	638 646	638 643	638 642
642 646	642 650	642 647	642 646
646 650	646 654	646 651	646 650
650 654	650 658	650 655	650 654
654 658	654 662	654 659	654 658
658 662	658 666	658 663	658 662
662 666	662 670	662 667	662 666
666 670	666 674	666 671	666 670
670 674	670 678	670 675	670 674
674 678	674 682	674 679	674 678
678 682	678 686	678 683	678 682
682 686	682 690	682 687	682 686
686 690	686 694	686 691	686 690
690 694	690 698	690 695	690 694
694 698	694 702	694 699	694 698
698 702	698 706	698 703	698 702
702 706	702 710	702 707	702 706
706 710	706 714	706 711	706 710
710 714	710 718	710 715	710 714
714 718	714 722	714 719	714 718
718 722	718 726	718 723	718 722
722 726	722 730	722 727	722 726
726 730	726 734	726 731	726 730
730 734	730 738	730 735	730 734
734 738	734 742	734 739	734 738
738 742	738 746	738 743	738 742
742 746	742 750	742 747	742 746
746 750	746 754	746 751	746 750
750 754	750 758	750 755	750 754
754 758	754 762	754 759	754 758
758 762	758 766	758 763	758 762
762 766	762 770	762 767	762 766
766 770	766 774	766 771	766 770
770 774	770 778	770 775	770 774
774 778	774 782	774 779	774 778
778 782	778 786	778 783	778 782
782 786	782 790	782 787	782 786
786 790	786 794	786 791	786 790
790 794	790 798	790 795	790 794
794 798	794 802	794 799	794 798
798 802	798 806	798 803	798 802
802 806	802 810	802 807	802 806
806 810	806 814	806 811	806 810
810 814	810 818	810 815	810 814
814 818	814 822	814 819	814 818
818 822	818 826	818 823	818 822
822 826	822 830	822 827	822 826
826 830	826 834	826 831	826 830
830 834	830 838	830 835	830 834
834 838	834 842	834 839	834 838
838 842	838 846	838 843	838 842
842 846	842 850	842 847	842 846
846 850	846 854	846 851	846 850
850 854	850 858	850 855	850 854
854 858	854 862	854 859	854 858
858 862	858 866	858 863	858 862
862 866	862 870	862 867	862 866
866 870	866 874	866 871	866 870
870 874	870 878	870 875	870 874
874 878	874 882	874 879	874 878
878 882	878 886	878 883	878 882
882 886	882 890	882 887	882 886
886 890	886 894	886 891	886 890
890 894	890 898	890 895	890 894
894 898	894 902	894 899	894 898
898 902	898 906	898 903	898 902
902 906	902 910	902 907	902 9

無常正法經卷之三

~~SECRET~~ ~~TOP SECRET~~ ~~NOFORN~~

Figure 1. A schematic diagram of the experimental setup. The subject is seated in a chair, viewing a screen. The screen displays a target (a red dot) and a starting point (a green dot). The subject's hand is positioned at the starting point. The distance between the starting point and the target is labeled as d . The subject's hand is moved towards the target, and the distance between the hand and the target is labeled as x . The subject's hand is moved towards the target, and the distance between the hand and the target is labeled as x .

ONLY FOR VA - 72-...

Yazın 1999

[illegible]

...the investigation being considerably
...of which was carried out in the
...the operations of the Institute re-
...the ... general has been
...the ... the ...
...to some extent that field was on
...the more important general
...IX would facilitate the general
...operating tests.

(The following information was obtained from the records of the Department of Social Services, State of New York.)

(41) Double pile fabric (e.g. in winter flying

The relative merits of the best types of each of these four classes of materials have not been established beyond question. For this purpose a very extensive investigation is required. In any case, the materials considered here are not equivalent effective treatments and should be further studied in respect of lightness and permeability, permeability to water vapour, and any other characteristics in which differences might occur. With the development of methods of testing now available, such an investigation could be carried out. It is of no use to compare different types of materials having different properties, since such comparison is compressible.

Various previous considerations in connection with the solution to provide it with a double pile fabric. It is not possible to water vapour, which is a disadvantage and may lead to accumulation of moisture in the fabric. The relative merits of these and of pile fabrics remain quite obscure. It is possible that quilted materials will prove to be as good as any other type of material. It is apparent that the percentage increase in resistance of a pile fabric with pressure is greater the lower is the pile. It is reasonable to expect that a double pile fabric will have a greater resistance to

compression and at the same initial thickness. This fact is confirmed by the excellence of the double pile fabrics used in the type 4 suit (and subsequent suits).

The first double pile fabric was made with a pile of very low quality wool. For reasons of supply this was changed to a blend of finer and coarser qualities. There are not any significant disadvantages in the use of lower qualities, although the comparison was not made with the best. The use of cotton (C3407) or rayon in the pile proved disadvantageous. There was

no significant difference in the resistance of the two fabrics. The use of rayon in the pile proved disadvantageous. There was no significant difference in the resistance of the two fabrics. The use of rayon in the pile proved disadvantageous. There was no significant difference in the resistance of the two fabrics.

The use of rayon in the pile proved disadvantageous. There was no significant difference in the resistance of the two fabrics. The use of rayon in the pile proved disadvantageous. There was no significant difference in the resistance of the two fabrics.

THE VALUE OF THE POSSIBILITY OF OBTAINING THE NECESSARY
PRESSURE IN THE DOUBLE GLEE TUBE OF A WATER
COLUMN, HOWEVER, SINCE PROVISION HAD TO BE MADE FOR AN
CHANGE OF ALTITUDE (THE GLEE CLOTHES RATHER THAN COATED
THE GLEE TUBE) AND ON THE OTHER, THE POSSIBILITY
OF OBTAINING ADEQUATE BUOYANCY IN THIS WAY WAS DEMONSTRATED

[illegible][illegible]

There is also considerable strain imposed on the tapes in the corners of the container while these latter are being engaged, and a series of the tape in these regions

[illegible]

have not been used in R.C. A.M. clothing.

[illegible]

~~Miscellaneous~~ ~~and~~ ~~on~~ ~~the~~ ~~subject~~ ~~of~~ ~~the~~ ~~above~~ ~~mentioned~~ ~~document~~ ~~is~~ ~~not~~ ~~included~~

... was created was either ... was

Discipline: Police Clothing

[illegible]

... constant at 100% levels in spite of wide
... was also made of the whole
... and also conditions

... instructions for the
... with suggestions of the subcommittee in June 1949
... with suggestions of the subcommittee accepted

... of electrically-heated clothes
... in June 1949
... with suggestions of the subcommittee accepted

... represented as urgent
... electrically-heated suit already
... of the earlier work
... to be worn as the
... flying suit
... and flying
... simplified
... as soon as possible

... simple and practical
... tested in the cold chamber
... (2212)

... half
... and

... was able to produce with limited time for fundamental investigation and with limited facilities available on a restricted market.

The development of a series of experiments in the development of electrically heated clothing was put at the disposal of the Canadian General Electric Company in April, 1944. Representatives of that Company's parent company, General Electric, brought electrically heated clothing to the attention of the Army Services in Canada. It is believed that this company's experience in the development of electrically heated clothing is the result of the U.S. National

... of the general principles of electrically heated clothing, as evolved by the U.S. Army Services, and of the various component parts of electrically heated clothing developed.

General Principles

... for electrically heated clothing may be summarized as follows: the following principles are in the field. They are summarized as follows (not in any order of merit):-

... the use of any component. Table 15 follows is to be avoided - elements and connections should be resistant to breakdown arising from repeated flexing (bending). There must be no danger of short circuits arising from wire contact. Interconnections must be made with insulation over elements. Wires should not cross if this can be avoided. Heating should be controlled by a separate circuit, not by one or two circuits. Interruption of which would cause extreme failure of the suit.

... of testing and servicing at intervals. Experience has made clear the importance of testing electrically heated clothing before and after each flight.

... equipment. There must be no interference with the communication system. Consumption of power must be limited to the capacity of the aircraft supply.

... of the suit should make it convenient to put on and take off. It should be possible to adjust the temperature of the suit to suit the conditions of the environment.

It is to be understood that the purpose of this report is to provide information on the subject of electrically heated clothing for the purpose of determining the feasibility of its use in the field.

~~Electrically heated clothing is a device which is designed to provide heat to the body by means of electrical energy.~~

Several conditions are to be considered for the purpose of determining the feasibility of its use in the field. The first condition is the level of activity of the wearer. The second condition is the duration of use. The third condition is the amount of heat required to maintain the normal body temperature of the wearer. The fourth condition is the weight of the clothing. The fifth condition is the cost of the clothing.

The first condition is the level of activity of the wearer. The second condition is the duration of use. The third condition is the amount of heat required to maintain the normal body temperature of the wearer. The fourth condition is the weight of the clothing. The fifth condition is the cost of the clothing.

The first condition is the level of activity of the wearer. The second condition is the duration of use. The third condition is the amount of heat required to maintain the normal body temperature of the wearer. The fourth condition is the weight of the clothing. The fifth condition is the cost of the clothing.

~~The first condition is the level of activity of the wearer. The second condition is the duration of use. The third condition is the amount of heat required to maintain the normal body temperature of the wearer. The fourth condition is the weight of the clothing. The fifth condition is the cost of the clothing.~~

The first condition is the level of activity of the wearer. The second condition is the duration of use. The third condition is the amount of heat required to maintain the normal body temperature of the wearer. The fourth condition is the weight of the clothing. The fifth condition is the cost of the clothing.

The first condition is the level of activity of the wearer. The second condition is the duration of use. The third condition is the amount of heat required to maintain the normal body temperature of the wearer. The fourth condition is the weight of the clothing. The fifth condition is the cost of the clothing.

The first condition is the level of activity of the wearer. The second condition is the duration of use. The third condition is the amount of heat required to maintain the normal body temperature of the wearer. The fourth condition is the weight of the clothing. The fifth condition is the cost of the clothing.

...insulating or clothing described on page 47
 ...provision in the clothing for insulation is
 ...the clothing for insulation is
 ...the clothing for insulation is
 ...the clothing for insulation is
 ...the clothing for insulation is
 ...the clothing for insulation is
 ...the clothing for insulation is
 ...the clothing for insulation is
 ...the clothing for insulation is
 ...the clothing for insulation is

in the figure system, heat loss is
 ...the clothing for insulation is
 ...the clothing for insulation is
 ...the clothing for insulation is

$$H + S = E + R$$

in the external system, heat loss and heat provided also
 ...the clothing for insulation is
 ...the clothing for insulation is
 ...the clothing for insulation is

$$H + S = E + R$$

...the clothing for insulation is
 ...the clothing for insulation is
 ...the clothing for insulation is
 ...the clothing for insulation is

It is obvious that a given amount of electrical
 ...the clothing for insulation is
 ...the clothing for insulation is
 ...the clothing for insulation is
 ...the clothing for insulation is
 ...the clothing for insulation is
 ...the clothing for insulation is
 ...the clothing for insulation is
 ...the clothing for insulation is
 ...the clothing for insulation is
 ...the clothing for insulation is

$$100 \times \frac{\text{total insulation outside heating elements}}{\text{all insulation surrounding the man}} = 100 \times$$

$$T_a \div T_b$$

...are practical ...

...is ... first ... to the ...

... is to maintain the ...

... is ... control ...

... of ...

... the control of ... is ...

... accordance with Mr. ...

... because it is ...

MINISTER OF DEFENSE
REQUIREMENTS FOR ELECTRICALLY HEATED CLOTHING

1. The purpose of this document is to define the requirements for electrically heated clothing to be used by the Canadian Armed Forces. This document is a part of the Department of Defense's efforts to ensure that all equipment and supplies are of the highest quality and meet the needs of the Canadian Armed Forces.

2. The requirements for electrically heated clothing are as follows:

FIGURE 12

RELATIVE TO BACK

All figures apply to back
except the 12 indicated for the palm



FIGURE 13

RELATIVE TO PALM



extra cleaning underneath it, would affect it.

• 1998

... a more reliable type
... and the ... regulator
... was used with a later production lot of
... clothing. A type for installation
... in aircraft was also designed (drawing 49)
... and ...
... a manual valve which
... the ... of the
... (drawing 49). It is not known to what
... conditions at places in the aircraft
... and ... representative of those
... the crew members.

A test regulator of the general design out-
lined above can be used in ...
... without thermostat. Detailed
instructions have been provided for ...
... enables an electrically heated
... to be used in ...
... also gives complete protection from overvoltage and to
short-circuiting of ... compensation for
... of the aircraft (drawing 49). No
... of a ...
... the ...
... in expected ... a long period
provision is made for short-circuiting the thermostat
switch so that when this is open the suit can be test-
ed for purposes of inspection or at stations. On the other
hand a test regulator does not ...
... in ...

Underneath the ... were provided ...
... these undergarments are for wear ...
... the winter ...
... designed by Mr.
... in ... the
... of the ...
... of ...
... with a braided ...
... an elaborate ...
... of ...
... of temperature
... This ...
... in the ...
... of the ...
... the ... to any equipment
... slow-acting thermostats led to the abandonment

the type of suit

The second type of underwear (Type B) (Figure 24) is a long-sleeved garment made by the H. & A. Co. of Boston, Mass. It is designed to meet the Subcommittee's requirements as to distribution and amount of heating. The heating elements consist of a steel and non-ferrous mesh, enclosed in a flameproofed wrapping of fabric which is stitched into the suit body. The mesh is made of two parallel wires, one of which is connected to the first connection point on the side of the garment. The second connection point is located on the side of the garment, and the two connections are connected to the power source.

The mesh is made of two parallel wires, one of which is connected to the first connection point on the side of the garment. The second connection point is located on the side of the garment, and the two connections are connected to the power source. The mesh is made of two parallel wires, one of which is connected to the first connection point on the side of the garment. The second connection point is located on the side of the garment, and the two connections are connected to the power source.

Electrically Heated Glove

The electrically heated glove is designed to meet the Subcommittee's requirements as to distribution and amount of heating. The standard glove is made of three separate parts: a wrist, a middle, and a finger. It is proposed that the glove be made of three separate parts: a wrist, a middle, and a finger. The inner part is the wrist, the middle part is the middle, and the outer part is the finger. The arrangement is such that the electric heating elements are located in the wrist, middle, and finger parts.

The inner part is the wrist, the middle part is the middle, and the outer part is the finger. The arrangement is such that the electric heating elements are located in the wrist, middle, and finger parts. The inner part is the wrist, the middle part is the middle, and the outer part is the finger. The arrangement is such that the electric heating elements are located in the wrist, middle, and finger parts.

The inner part is the wrist, the middle part is the middle, and the outer part is the finger. The arrangement is such that the electric heating elements are located in the wrist, middle, and finger parts. The inner part is the wrist, the middle part is the middle, and the outer part is the finger. The arrangement is such that the electric heating elements are located in the wrist, middle, and finger parts.

The inner part is the wrist, the middle part is the middle, and the outer part is the finger. The arrangement is such that the electric heating elements are located in the wrist, middle, and finger parts. The inner part is the wrist, the middle part is the middle, and the outer part is the finger. The arrangement is such that the electric heating elements are located in the wrist, middle, and finger parts.

The inner part is the wrist, the middle part is the middle, and the outer part is the finger. The arrangement is such that the electric heating elements are located in the wrist, middle, and finger parts. The inner part is the wrist, the middle part is the middle, and the outer part is the finger. The arrangement is such that the electric heating elements are located in the wrist, middle, and finger parts.

The inner part is the wrist, the middle part is the middle, and the outer part is the finger. The arrangement is such that the electric heating elements are located in the wrist, middle, and finger parts. The inner part is the wrist, the middle part is the middle, and the outer part is the finger. The arrangement is such that the electric heating elements are located in the wrist, middle, and finger parts.

The inner part is the wrist, the middle part is the middle, and the outer part is the finger. The arrangement is such that the electric heating elements are located in the wrist, middle, and finger parts. The inner part is the wrist, the middle part is the middle, and the outer part is the finger. The arrangement is such that the electric heating elements are located in the wrist, middle, and finger parts.

The inner part is the wrist, the middle part is the middle, and the outer part is the finger. The arrangement is such that the electric heating elements are located in the wrist, middle, and finger parts. The inner part is the wrist, the middle part is the middle, and the outer part is the finger. The arrangement is such that the electric heating elements are located in the wrist, middle, and finger parts.

Page 13
show
1316
1316
1316

has
regul
transmit
ent
id

Page 4
Electric
1316
1316
1316

ALL INFORMATION CONTAINED HEREIN IS UNCLASSIFIED

... from the ... the ... full heating could be obtained (2011).
... the ... connection ...
... the ...
... by the ...

[illegible][illegible]

...some conditions of urgency. ...the ... of ...

...with a maximum of 100 watts. The results showed that a power of 10 watts was sufficient to maintain a comfortable and reasonable skin temperature. An experimental underfoot was used with a variable heating in seven different regions of the foot. It was concluded that 10 watts would protect the foot at temperatures ranging down to -20°C. under still conditions. It is likely that a rather higher power would be required for a more rapid distribution of heat in the foot. It will be noted that the greatest concentration of heating is over the toes and the heel. More is needed over the arch and upper part of the foot (except at the toes). There was no time to investigate

...the inner side just behind the ankle

1. The first step is to identify the problem or question that needs to be answered. This involves understanding the context and the specific information required.

[illegible]

of similar power and have equally good results in
placed under the control of the heating element. The
the fact is long (2222), and there is undoubtedly a
reasonable latitude in the amount of heating element.

four layers of material, two layers of each material in each
layer of cotton flannel cloth which are sewed to form
channels for the heating elements. The heating elements
and the method of incorporating them are those already
Two some fasteners on each
connection to the tank on the
the heating element in each
the heat regulator

on the 22 underfoot and on the Taylor type exceptionally
heated rubber (made by Deason Brothers). (one of each
a 2222 underfoot and a 2222 underfoot. The 2222 underfoot
is the 22 underfoot and the 2222 underfoot.

practically or completely broken in all cases of the heel
from measurements of resistance which were made particu-
larly during the last year. It is understood that the
the 2222 underfoot and the 2222 underfoot.

Air-Heated Underfoot

Electrical

Work on the

work on the 2222 underfoot and the 2222 underfoot
air heating was already installed in the aircraft in which, not
of heating was collected in the aircraft owing to the rapid
displacement and loss of heat supplied. It is understood
that the 2222 underfoot and the 2222 underfoot.

the 2222 underfoot and the 2222 underfoot
the 2222 underfoot and the 2222 underfoot.



Fig. 2. (a-c).
Mr. Tolson's suit
front view.

Fig. 2. (d-e).
Mr. Tolson's suit
back view.



1. The first of these is the fact that the Commission has not yet received any information from the Government of the United States regarding the results of its investigation of the activities of the Committee for the Liberation of the Americas (CLA) in the United States.

The light-weight diving suit will not

[illegible]

These materials have been prepared with cover-
ings of carbonation ('Camazine' - 50 84), 'Lackie Lull'
and 'Lackie Lull' (Lackie Lull) and 'Lackie Lull'
live materials of these materials in withstand noxious wear.

The first prototype uniforms, all constructed by hand, were made on 12-ounce flannel material in the colors of khaki and olive drab. The design of an aircrew outfit in January of 1942. Immediately on the initiation of this program, the two pilots in the Canadian Army, (similar to the Canadian Army Battalions, and their crew suit. Desirable features of each were selected (CERMA)

UNCLASSIFIED

On consideration of records of issue of
aircrew suits to the N.C.A. it was determined
that the aircrew suit requirements were met by the
N.C.A. and that the N.C.A. had a sufficient stockpile of
aircrew suits to meet the needs of the Navy's Initial
Training School, N.C.A., and found that the range of
sizes of aircrew suits was satisfactory (C2A12).

10. The illustration was also given to the style and materials of a summer afternoon suit that no other was made for and hence, to produce this:

人 工 智 能

$\frac{1}{2} \left(\frac{1}{2} + \frac{1}{2} \right) = \frac{1}{2}$

Journal of Management Education 30(6)p.789-804
© The Author(s) 2006

... ..

10-10-68

C-60

100-443887-100

... ..

— *Journal of the American Medical Association*, 1997; 278: 1001-1002

[illegible][illegible]

... ..

[illegible][illegible][illegible]

...the ...

... ..

5. The following information is provided for the year ended 31 December 2014:

.....

1. The first step in the process is to identify the problem or issue that needs to be addressed. This involves gathering information and understanding the context of the problem.

... ..

THE UNIVERSITY OF CHICAGO

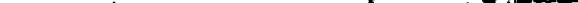
[illegible]

Figure 1. Aerial photograph of the study area. The road is marked with a dashed line. The buildings are marked with black dots. The water body is marked with a blue area. The land area is marked with a green area.

100-443886-1000

[illegible]

THE UNIVERSITY OF CHICAGO

Year	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																			
Population	1,000,000	1,050,000	1,100,000	1,150,000	1,200,000	1,250,000	1,300,000	1,350,000	1,400,000	1,450,000	1,500,000	1,550,000	1,600,000	1,650,000	1,700,000	1,750,000	1,800,000	1,850,000	1,900,000	1,950,000	2,000,000	2,050,000	2,100,000	2,150,000	2,200,000	2,250,000	2,300,000	2,350,000	2,400,000	2,450,000	2,500,000	2,550,000	2,600,000	2,650,000	2,700,000	2,750,000	2,800,000	2,850,000	2,900,000	2,950,000	3,000,000	3,050,000	3,100,000	3,150,000	3,200,000	3,250,000	3,300,000	3,350,000	3,400,000	3,450,000	3,500,000	3,550,000	3,600,000	3,650,000	3,700,000	3,750,000	3,800,000	3,850,000	3,900,000	3,950,000	4,000,000	4,050,000	4,100,000	4,150,000	4,200,000	4,250,000	4,300,000	4,350,000	4,400,000	4,450,000	4,500,000	4,550,000	4,600,000	4,650,000	4,700,000	4,750,000	4,800,000	4,850,000	4,900,000	4,950,000	5,000,000	5,050,000	5,100,000	5,150,000	5,200,000	5,250,000	5,300,000	5,350,000	5,400,000	5,450,000	5,500,000	5,550,000	5,600,000	5,650,000	5,700,000	5,750,000	5,800,000	5,850,000	5,900,000	5,950,000	6,000,000	6,050,000	6,100,000	6,150,000	6,200,000	6,250,000	6,300,000	6,350,000	6,400,000	6,450,000	6,500,000	6,550,000	6,600,000	6,650,000	6,700,000	6,750,000	6,800,000	6,850,000	6,900,000	6,950,000	7,000,000	7,050,000	7,100,000	7,150,000	7,200,000	7,250,000	7,300,000	7,350,000	7,400,000	7,450,000	7,500,000	7,550,000	7,600,000	7,650,000	7,700,000	7,750,000	7,800,000	7,850,000	7,900,000	7,950,000	8,000,000	8,050,000	8,100,000	8,150,000	8,200,000	8,250,000	8,300,000	8,350,000	8,400,000	8,450,000	8,500,000	8,550,000	8,600,000	8,650,000	8,700,000	8,750,000	8,800,000	8,850,000	8,900,000	8,950,000	9,000,000	9,050,000	9,100,000	9,150,000	9,200,000	9,250,000	9,300,000	9,350,000	9,400,000	9,450,000

Understand Your Time

11. *Chlorophyll *a** and *Chlorophyll *b** were determined by the method of Arar and Collins (1971).

10-10-68

1029

SECRET

15

1000

1. $\frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$

ii) $\mathcal{H}^1(\mathbb{R}^n) \subset \mathcal{H}^1(\mathbb{R}^n)$ and $\mathcal{H}^1(\mathbb{R}^n) \subset \mathcal{H}^1(\mathbb{R}^n)$ are both true.

[illegible]



Fig. 29. (a) High speed flying suit, with basic condition Goggles, helmet, and shoes, winter flying gear.



Fig. 30. (b) Assembled Emergency kit, A. Emergency suit and neck helmet.

There were long and on
the subject of two-piece under-
garments. It was pointed out that the sleeves
of the undergarment should be long, since comfort
was a consideration. The sleeves of the undergarment
should be long and must stay together. The
subject of the undergarment was discussed at the
meeting. Perhaps the most convincing argument was
that the undergarment is more practical for general use,
since one half may wear out first and can be replaced
separately.

It was decided that the undergarment should be made of a material that is comfortable and durable. It was also decided that the undergarment should be made in a size that would fit most people. It was also decided that the undergarment should be made in a color that is not easily soiled.

FLYING GLOVE

A brief investigation (C2J77) was made of the
subject of wearing a Brynje vest on the rate of water
loss from the skin and on the absorption of water through
the skin. It was found that there was a smaller absorp-
tion of moisture in the inner clothing when a Brynje
vest was worn instead of an ordinary winter garment.
In two subjects sitting or walking for periods of 100
minutes it was concluded that the Brynje vest might
be useful in cases of exposure to cold at reasonable times.
No further work was undertaken. It is suggested that the
subject of the Brynje vest be considered operationally in view of
the results of the above investigation.

FLYING GLOVE

Investigation was carried out (C2J77) in
relation to subjects sitting in the cold chamber at 5:1
and investigation unit, of the protection against
the various types of flying glove available.
The investigation showed that no glove was
found to be suitable for use during an

1. *Phragmites australis* (Cav.) Trin. ex Steud.

...the ... of the ...
...the ... of the ...
...the ... of the ...
...the ... of the ...
...the ... of the ...

1. A finger flying glove was designed in collaboration with the Julius Reyer Company, Blackrooke, Oregon, under the special supervision of Mr. J. H. Stewart. A limited rayon material was collected, after consideration of the merits of each. Instead of the silk (no longer available) after consideration of a number of wool fibres from the same or like of various sources, and after an investigation of the various types of wool (see 102293), a suitable sign of glove was chosen. For information was given to various sources with several persons. A high grade of worldwide

Zero Band

Time in seconds and gloves

R.A.P. SIKK
RLOVE

1 2 3 4 5 6 7 8

Serial Number of Trials

Time in seconds of the R.A.P. SIKK by



Fig. 24. Inner winter flying glove,
Type E, (R. 100). (Dark patches
on thumb and forefinger are
areas sprayed with latex for
better grip.)



Fig. 25. (Kitt o) wool winter flying
glove Type E.

...the Government of a contestation failed. For
the first a flying suit lacking buoyancy was accepted as
a project in April, 1941. Meeting it at the moment of
the Flying Committee. The requirements given were:

- [illegible]

The available literature on survival of the new types of life jacket were determined by Aitcher, 1945 (G0893, G2340). Throughout the development there was a lack of adequate information as to survival requirements until February, 1945, (Kneeling In) which work on life jackets was abandoned until such time as the necessary information should be provided. This lack of knowledge retarded both the design and testing of the type of flotation desired and the details as to the fitting of straps, rings, buckles, and so forth, as required when a great many changes and interchanges were extensively demanded. In the attempt to develop a life jacket the investigation had been

[illegible]

Pl. 35 (left) (left)
Pl. 36 (right) (right)
Pl. 37 (left) (left)

Pl. 38 (left) (left)
Pl. 39 (right) (right)
Pl. 40 (left) (left)

the other two types were
available on account of their bulk, while the
other two types were found in aircraft and in barracks. Certain aircraft

was received from the other side
the service team
the aircraft team with certain
equipment and the other two types were found in aircraft and in barracks. Certain aircraft

discussion at the time of the
that there had been an emergency equipment
the aircraft team with certain
equipment and the other two types were found in aircraft and in barracks. Certain aircraft
the aircraft team with certain
equipment and the other two types were found in aircraft and in barracks. Certain aircraft

the aircraft team with certain
equipment and the other two types were found in aircraft and in barracks. Certain aircraft
the aircraft team with certain
equipment and the other two types were found in aircraft and in barracks. Certain aircraft

the aircraft team with certain
equipment and the other two types were found in aircraft and in barracks. Certain aircraft
the aircraft team with certain
equipment and the other two types were found in aircraft and in barracks. Certain aircraft

the aircraft team with certain
equipment and the other two types were found in aircraft and in barracks. Certain aircraft
the aircraft team with certain
equipment and the other two types were found in aircraft and in barracks. Certain aircraft

Journal of Management Education 36(7) 809-824

1. The first step is to identify the problem. This involves understanding the situation and the goals that need to be achieved. It is important to gather all relevant information and to define the problem clearly.

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, 2100-2101, 2102-2103, 2104-2105, 2106-2107, 2108-2109, 2110-2111, 2112-2113, 2114-2115, 2116-2117, 2118-2119, 2120-2121, 2122-2123, 2124-2125, 2126-2127, 2128-2129, 2130-2131, 2132-2133, 2134-2135, 2136-2137, 2138-2139, 2140-2141, 2142-2143, 2144-2145, 2146-2147, 2148-2149, 2150-2151, 2152-2153, 2154-2155, 2156-2157, 2158-2159, 2160-2161, 2162-2163, 2164-2165, 2166-2167, 2168-2169, 2170-2171, 2172-2173, 2174-2175, 2176-2177, 2178-2179, 2180-2181, 2182-2183, 2184-2185, 2186-2187, 2188-2189, 2190-2191, 2192-2193, 2194-2195, 2196-2197, 2198-2199, 2200-2201, 2202-2203, 2204-2205, 2206-2207, 2208-2209, 2210-2211, 2212-2213, 2214-2215, 2216-2217, 2218-2219, 2220-2221, 2222-2223, 2224-2225, 2226-2227, 2228-2229, 2230-2231, 2232-2233, 2234-2235, 2236-2237, 2238-2239, 2240-2241, 2242-2243, 2244-2245, 2246-2247, 2248-2249, 2250-2251, 2252-2253, 2254-2255, 2256-2257, 2258-2259, 2260-2261, 2262-2263, 2264-2265, 2266-2267, 2268-2269, 2270-2271, 2272-2273, 2274-2275, 2276-2277, 2278-2279, 2280-2281, 2282-2283, 2284-2285, 2286-2287, 2288-2289, 2290-2291, 2292-2293, 2294-2295, 2296-2297, 2298-2299, 2300-2301, 2302-2303, 2304-2305, 2306-2307, 2308-2309, 2310-2311, 2312-2313, 2314-2315, 2316-2317, 2318-2319, 2320-2321, 2322-2323, 2324-2325, 2326-2327, 2328-2329, 2330-2331, 2332-2333, 2334-2335, 2336-2337, 2338-2339, 2340-2341, 2342-2343, 2344-2345, 2346-2347, 2348-2349, 2350-2351, 2352-2353, 2354-2355, 2356-2357, 2358-2359, 2360-2361, 2362-2363, 2364-2365, 2366-2367, 2368-2369, 2370-2371, 2372-2373, 2374-2375, 2376-2377, 2378-2379, 2380-2381, 2382-2383, 2384-2385, 2386-2387, 2388-2389, 2390-2391, 2392-2393, 2394-2395, 2396-2397, 2398-2399, 2400-2401, 2402-2403, 2404-2405, 2406-2407, 2408-2409, 2410-2411, 2412-2413, 2414-2415, 2416-2417, 2418-2419, 2420-2421, 2422-2423, 2424-2425, 2426-2427, 2428-2429, 2430-2431, 2432-2433, 2434-2435, 2436-2437, 2438-2439, 2440-2441, 2442-2443, 2444-2445, 2446-2447, 2448-2449, 2450-2451, 2452-2453, 2454-2455, 2456-2457, 2458-2459, 2460-2461, 2462-2463, 2464-2465, 2466-2467, 2468-2469, 2470-2471, 2472-2473, 2474-2475, 2476-2477, 2478-2479, 2480-2481, 2482-2483, 2484-2485, 2486-2487, 2488-2489, 2490-2491, 2492-2493, 2494-2495, 2496-2497, 2498-2499, 2500-2501, 2502-2503, 2504-2505, 2506-2507, 2508-2509, 2510-2511, 2512-2513, 2514-2515, 2516-2517, 2518-2519, 2520-2521, 2522-2523, 2524-2525, 2526-2527, 2528-2529, 2530-2531, 2532-2533, 2534-2535, 2536-2537, 2538-2539, 2540-2541, 2542-2543, 2544-2545, 2546-2547, 2548-2549, 2550-2551, 2552-2553, 2554-2555, 2556-2557, 2558-2559, 2560-2561, 2562-2563, 2564-2565, 2566-2567, 2568-2569, 2570-2571, 2572-2573, 2574-2575, 2576-2577, 2578-2579, 2580-2581, 2582-2583, 2584-2585, 2586-2587, 2588-2589, 2590-2591, 2592-2593, 2594-2595, 2596-2597, 2598-2599, 2600-2601, 2602-2603, 2604-2605, 2606-2607, 2608-2609, 2610-2611, 2612-2613, 2614-2615, 2616-2617, 2618-2619, 2620-2621, 2622-2623, 2624-2625, 2626-2627, 2628-2629, 2630-2631, 2632-2633, 2634-2635, 2636-2637, 2638-2639, 2640-2641, 2642-2643, 2644-2645, 2646-2647, 2648-2649, 2650-2651, 2652-2653, 2654-2655, 2656-2657, 2658-2659, 2660-2661, 2662-2663, 2664-2665, 2666-2667, 2668-2669, 2670-2671, 2672-2673, 2674-2675, 2676-2677, 2678-2679, 2680-2681, 2682-2683, 2684-2685, 2686-2687, 2688-2689, 2690-2691, 2692-2693, 2694-2695, 2696-2697, 2698-2699, 2700-2701, 2702-2703, 2704-2705, 2706-2707, 27

(-----) In June, 1948, a new type of inflation was

checked in original. Valuable advice was received

Figure 1. The effect of the concentration of the *Agrobacterium* suspension on the transformation efficiency of *Agrobacterium* strains.

... the
... ..

ALL INFORMATION CONTAINED HEREIN IS UNCLASSIFIED

the time that the jacket was given to him.

RECEIVED

10-10-68

[illegible]

the general distribution of buoyancy remains

10. Irradiation can be effected by microwaves or CO₂

[Faint, illegible markings]

1. The first step is to identify the problem or question that needs to be answered. This involves understanding the context and the specific information required.



20 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 1



0.4 and when 0.4 was reached, the jacket was removed by the 1st of the 1st.

that the jacket is made of a material which is not as good as the jacket used in the 1st of the 1st. The jacket is made of a material which is not as good as the jacket used in the 1st of the 1st. The jacket is made of a material which is not as good as the jacket used in the 1st of the 1st.

the jacket is made of a material which is not as good as the jacket used in the 1st of the 1st. The jacket is made of a material which is not as good as the jacket used in the 1st of the 1st. The jacket is made of a material which is not as good as the jacket used in the 1st of the 1st.

the jacket is made of a material which is not as good as the jacket used in the 1st of the 1st. The jacket is made of a material which is not as good as the jacket used in the 1st of the 1st. The jacket is made of a material which is not as good as the jacket used in the 1st of the 1st.

the jacket is made of a material which is not as good as the jacket used in the 1st of the 1st. The jacket is made of a material which is not as good as the jacket used in the 1st of the 1st. The jacket is made of a material which is not as good as the jacket used in the 1st of the 1st.

the jacket is made of a material which is not as good as the jacket used in the 1st of the 1st. The jacket is made of a material which is not as good as the jacket used in the 1st of the 1st. The jacket is made of a material which is not as good as the jacket used in the 1st of the 1st.

the jacket is made of a material which is not as good as the jacket used in the 1st of the 1st. The jacket is made of a material which is not as good as the jacket used in the 1st of the 1st. The jacket is made of a material which is not as good as the jacket used in the 1st of the 1st.

The type of construction, which is made of
concrete of a lattice, with a cord, and this with
the type of construction, which is made of
concrete of a lattice, with a cord, and this with

A vertical, cylindrical, flashing bulb has been
constructed in the form of a cylindrical shell, within
the shell, with a cord, and this with
the type of construction, which is made of
concrete of a lattice, with a cord, and this with
the type of construction, which is made of
concrete of a lattice, with a cord, and this with
the type of construction, which is made of
concrete of a lattice, with a cord, and this with
the type of construction, which is made of
concrete of a lattice, with a cord, and this with

by reason of its construction and because of the air con-
tained in it. Without the need for any other
construction, which is made of
concrete of a lattice, with a cord, and this with
the type of construction, which is made of
concrete of a lattice, with a cord, and this with
the type of construction, which is made of
concrete of a lattice, with a cord, and this with
the type of construction, which is made of
concrete of a lattice, with a cord, and this with

which is made of
concrete of a lattice, with a cord, and this with
the type of construction, which is made of
concrete of a lattice, with a cord, and this with
the type of construction, which is made of
concrete of a lattice, with a cord, and this with
the type of construction, which is made of
concrete of a lattice, with a cord, and this with
the type of construction, which is made of
concrete of a lattice, with a cord, and this with

the type of construction, which is made of
concrete of a lattice, with a cord, and this with
the type of construction, which is made of
concrete of a lattice, with a cord, and this with
the type of construction, which is made of
concrete of a lattice, with a cord, and this with
the type of construction, which is made of
concrete of a lattice, with a cord, and this with
the type of construction, which is made of
concrete of a lattice, with a cord, and this with

the type of construction, which is made of
concrete of a lattice, with a cord, and this with
the type of construction, which is made of
concrete of a lattice, with a cord, and this with
the type of construction, which is made of
concrete of a lattice, with a cord, and this with
the type of construction, which is made of
concrete of a lattice, with a cord, and this with
the type of construction, which is made of
concrete of a lattice, with a cord, and this with

TABLE VIII

Comparison of the performance of the "Mach 1" and "Mach 2" aircraft in the "Mach 1" and "Mach 2" tests.

TABLE VIII. Mach 1

Altitude (ft) Relative to intensity of light in miles

Altitude (ft)	Relative to intensity of light in miles
500	5.0
1000	2.5
1500	1.7
2000	1.3

Altitude (ft) Relative to intensity of light in miles

Altitude (ft)	Relative to intensity of light in miles
2500	1.0
3000	0.8
3500	0.7
4000	0.6

Altitude (ft) Relative to intensity of light in miles

Altitude (ft)	Relative to intensity of light in miles
4500	0.5
5000	0.4
5500	0.3
6000	0.2

Altitude (ft) Relative to intensity of light in miles

Altitude (ft)	Relative to intensity of light in miles
6500	0.1
7000	0.1
7500	0.1
8000	0.1

Altitude (ft) Relative to intensity of light in miles

Altitude (ft)	Relative to intensity of light in miles
8500	0.1
9000	0.1
9500	0.1
10000	0.1

Altitude (ft) Relative to intensity of light in miles

Altitude (ft)	Relative to intensity of light in miles
10500	0.1
11000	0.1
11500	0.1
12000	0.1

Altitude (ft) Relative to intensity of light in miles

Altitude (ft)	Relative to intensity of light in miles
12500	0.1
13000	0.1
13500	0.1
14000	0.1

Altitude (ft) Relative to intensity of light in miles

Altitude (ft)	Relative to intensity of light in miles
14500	0.1
15000	0.1
15500	0.1
16000	0.1

Altitude (ft) Relative to intensity of light in miles

Altitude (ft)	Relative to intensity of light in miles
16500	0.1
17000	0.1
17500	0.1
18000	0.1

Altitude (ft) Relative to intensity of light in miles

Altitude (ft)	Relative to intensity of light in miles
18500	0.1
19000	0.1
19500	0.1
20000	0.1

in a very superficial manner, or water from the knees
down when one is floating in the vertical position. It
was found that for Canadian requirements to limit
the use of the suit to the upper part of the suit,
provided that this restriction is a matter of feasibility did
not cause undue discomfort.

Tests were therefore conducted to
determine the feasibility of a water
proof suit for the upper part of the suit.
Tests were conducted under various conditions
and it was found that it was possible to
construct a suit which was practically as
comfortable as the entirely waterproof suit in all cases.
The suit was constructed of a material which was
waterproof and comfortable. The construction
of the suit was as follows: The suit was
constructed of a material which was waterproof
and comfortable. The suit was constructed
of a material which was waterproof and comfortable.

The suit was constructed of a material which was waterproof
and comfortable. The suit was constructed
of a material which was waterproof and comfortable.
The suit was constructed of a material which was waterproof
and comfortable. The suit was constructed
of a material which was waterproof and comfortable.
The suit was constructed of a material which was waterproof
and comfortable. The suit was constructed
of a material which was waterproof and comfortable.
The suit was constructed of a material which was waterproof
and comfortable. The suit was constructed
of a material which was waterproof and comfortable.

The suit was constructed of a material which was waterproof
and comfortable. The suit was constructed
of a material which was waterproof and comfortable.
The suit was constructed of a material which was waterproof
and comfortable. The suit was constructed
of a material which was waterproof and comfortable.
The suit was constructed of a material which was waterproof
and comfortable. The suit was constructed
of a material which was waterproof and comfortable.
The suit was constructed of a material which was waterproof
and comfortable. The suit was constructed
of a material which was waterproof and comfortable.

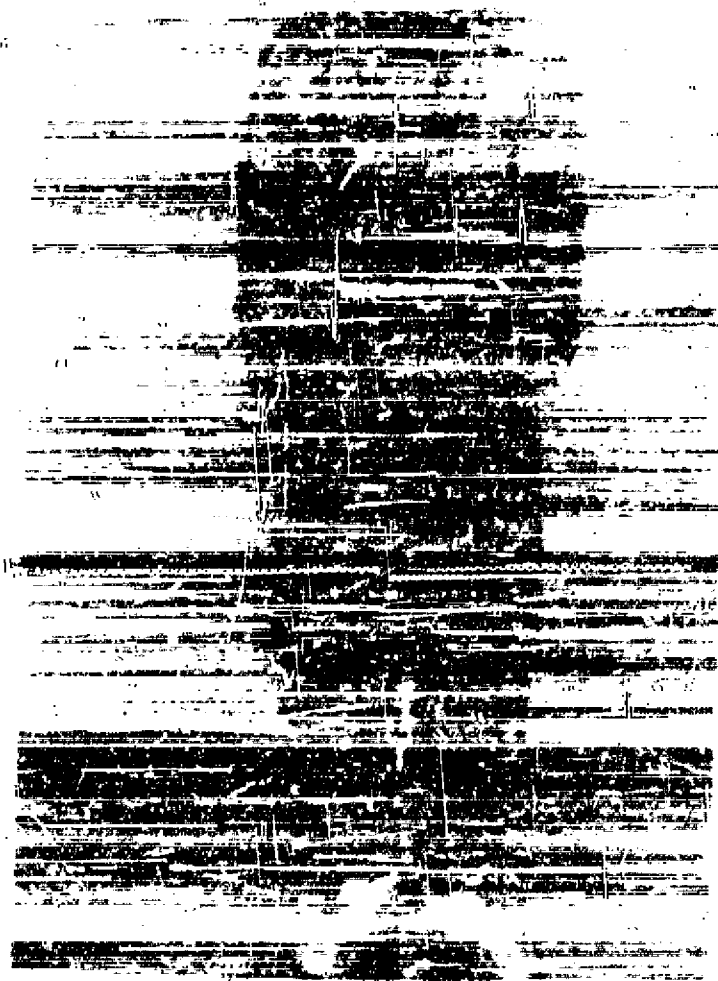


Fig. 48. Flight exposure suit, type 1.
(Drawstrings around neck not
drawn tight).

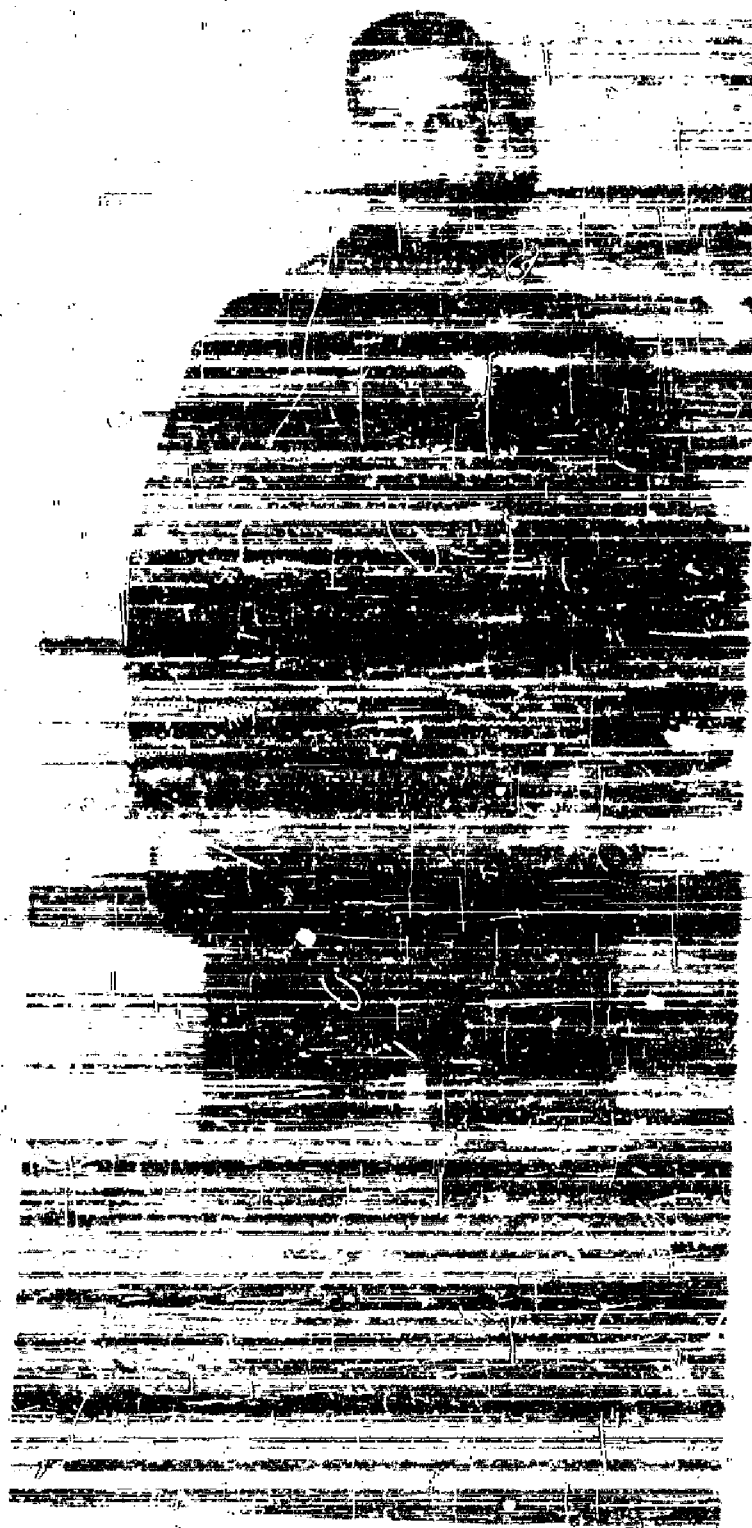
... ..

100-443887-100

ALL INFORMATION CONTAINED HEREIN IS UNCLASSIFIED
DATE 08-01-2001 BY 60322 UCBAW

1. 凡在本行開辦之各項業務，均應遵守本行所訂之各項規章，並應隨時注意本行所訂之各項規章，如有違反者，本行將依法究辦。

11-11-61



SECRET

五、“三不”原则：不公开、不承认、不追究。

1. The first part of the document is a list of names and titles, including "The Hon. Mr. Justice" and "The Hon. Mr. Justice".

SECRET

... to the

... OF A HOUSE, QUART, OR MORE CONTAINING

— 17 —

100 units for shipment to England, where flight

1. The first step in the process is to identify the problem or issue that needs to be addressed. This involves gathering information and understanding the context of the problem.

the 1990s, the number of people in the world who are under 15 years of age is expected to increase from 1.1 billion to 1.5 billion. The number of people aged 65 and over is expected to increase from 250 million to 450 million. The number of people aged 15 and over is expected to increase from 3.5 billion to 4.5 billion. The number of people aged 15 and over is expected to increase from 3.5 billion to 4.5 billion. The number of people aged 15 and over is expected to increase from 3.5 billion to 4.5 billion.

1. The first step in the process is to identify the problem or issue that needs to be addressed. This involves gathering information and understanding the context of the problem.

THE UNIVERSITY OF CHICAGO
LIBRARY
540 EAST 57TH STREET
CHICAGO, ILL. 60637

1944-1945

DATE 4-11-68

Click here to view the full document: [View Full Document](#)

1. 凡在本行开立存款账户的客户，均可向本行申请开立定期存款账户。
 2. 定期存款账户的开立，须由客户填写《定期存款开户申请书》，并提供有效身份证件。
 3. 本行定期存款账户分为整存整付、零存整付、整存零付、零存零付四种类型。
 4. 定期存款的期限分为三个月、六个月、九个月、十二个月、十八个月、二十四个月、三十六个月、四十八个月、六十个月、七十二个月、八十四个月、九十六个月、一百零八个月、一百二十个月。
 5. 定期存款的利率按中国人民银行规定的利率执行。
 6. 定期存款账户的开立，须由客户本人或授权代理人办理。
 7. 定期存款账户的开立，须由客户本人或授权代理人提供有效身份证件。
 8. 定期存款账户的开立，须由客户本人或授权代理人填写《定期存款开户申请书》。
 9. 定期存款账户的开立，须由客户本人或授权代理人提供有效身份证件。
 10. 定期存款账户的开立，须由客户本人或授权代理人填写《定期存款开户申请书》。

OF AMERICA

100

...the results of all these trials...
...of violence...
...and by venting...
...was considered...
...as important...
...the know...

489. in the

16-00000

14-00000

The investigation was carried out at [redacted] by [redacted]. The protective screening [redacted] was maintained throughout the investigation. In addition,

ALL INFORMATION CONTAINED HEREIN IS UNCLASSIFIED
DATE 06-11-2001 BY 60322 UCBAW

...the Government was required
...to provide a...
...the...
...A thorough

THE 1960 REPORT (MEMO) AND ON AN
SCHEDULE OF "SCHEDULING" SYSTEMS.

It was recommended that all information received from the Bureau of Investigation be forwarded to the Department of Justice.

1. The first of these is the fact that the Commission has not yet received any information from the Government of the United States regarding the results of its investigation of the activities of the Committee for the Liberation of the People of the East (CLPE) in the United States.

1. *Chlorophyll a* and *Chlorophyll b* were determined by the method of Arar and Collins (1971).

Recommended Code -

OFFICIALS -

General -

General -

General -

General -

General -

General -

General -

General -

General -

General -

General -

General -

General -

General -

General -

Emergency equipment is needed by aircrews who have
been assigned to isolated land regions. It must
be of the type that can be used in the most
difficult conditions.



It is clear that only a limited number of
agencies can be carrying on this type of work for the
purpose. A very careful selection of articles to be in-
cluded in the publication is necessary. A special
edition is a possibility for the work in question. It
may be possible to include in the publication a special
section devoted to the subject of parachute descents.

in an effort to make the personnel etc., being limited to only the most essential articles, could be of more assistance and cover flying over land or over the water. The latter are larger and can include content depending on whether they are to be used on land.

~~SECRET~~

CONFIDENTIAL

Radical Pill: Improves the quality of the blood, increases the production of red blood cells, improves the circulation, and improves the overall health of the body. It is a natural remedy for many ailments, including anemia, low energy, and poor circulation. It is made from natural ingredients, including iron, copper, and zinc, and is safe for most people. It is available in many forms, including capsules, tablets, and liquid. It is a natural remedy for many ailments, including anemia, low energy, and poor circulation. It is made from natural ingredients, including iron, copper, and zinc, and is safe for most people. It is available in many forms, including capsules, tablets, and liquid.

~~Aircraft Inc. - For 000 years of corporate life~~

1. 凡在本行开立存款账户的客户，均可向本行申请开立定期存款账户。
 2. 定期存款账户的开立，须由客户填写《定期存款开户申请书》，并提供有效身份证件。
 3. 本行定期存款账户分为整存整付、零存整付、整存零付、零存零付四种类型。
 4. 定期存款的期限分为三个月、六个月、九个月、十二个月、十八个月、二十四个月、三十六个月、四十八个月、六十个月、七十二个月、八十四个月、九十六个月、一百零八个月、一百二十个月。
 5. 定期存款的利率按中国人民银行规定的利率执行。
 6. 定期存款账户的开立，须由客户本人或授权代理人办理。
 7. 定期存款账户的开立，须由客户本人或授权代理人提供有效身份证件。
 8. 定期存款账户的开立，须由客户本人或授权代理人提供有效身份证件。
 9. 定期存款账户的开立，须由客户本人或授权代理人提供有效身份证件。
 10. 定期存款账户的开立，须由客户本人或授权代理人提供有效身份证件。

... were considered to be satisfactory.
... were not carried in the
... they were not carried in the

SECRET

Figure 1

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
84

11



10

10/10/44

10/10/44

10/10/44

10/10/44

10/10/44

10/10/44

10/10/44

10/10/44

10/10/44

10/10/44

10/10/44

10/10/44

10/10/44

10/10/44

10/10/44

10/10/44

10/10/44

10/10/44

10/10/44

10/10/44

10/10/44

10/10/44

10/10/44

10/10/44

10/10/44

10/10/44

10/10/44

10/10/44

10/10/44

10/10/44

10/10/44

10/10/44

10/10/44

10/10/44

10/10/44

10/10/44

10/10/44

10/10/44

10/10/44

10/10/44

10/10/44

10/10/44

10/10/44

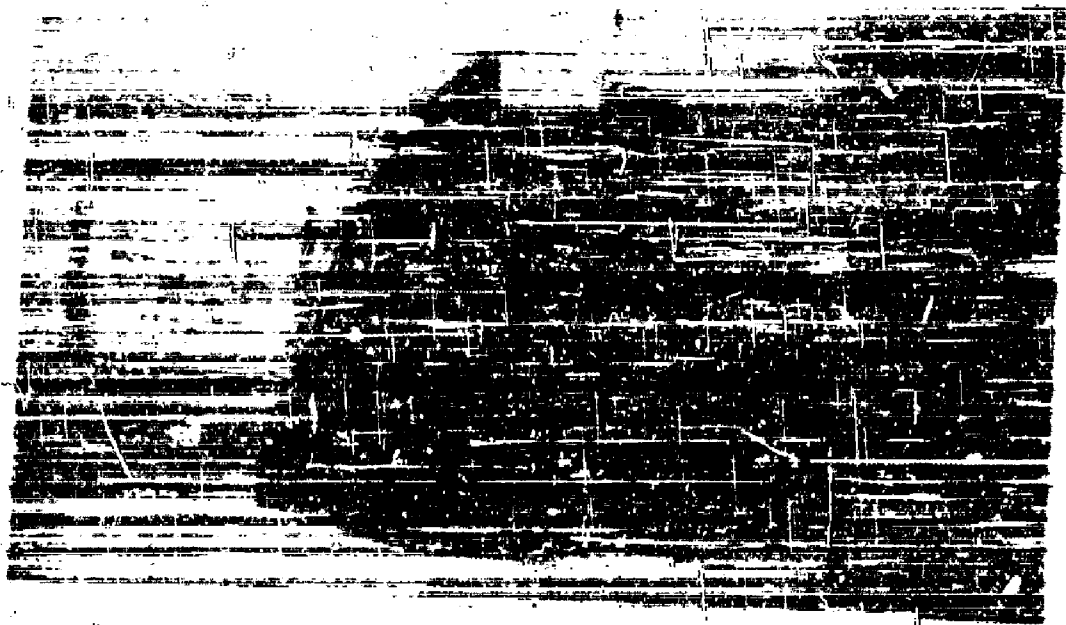


FIG. 46 (A) - EMERGENCY KIT - Emergency Kit
Type A.

FIG. 47 (A) - EMERGENCY KIT - Emergency Kit
Type B.





Fig. 40 (above), Emergency kits : rationing

Fig. 40 (below), Emergency kits : electric bag



11

THE ABOVE IS THE BEST COPY AVAILABLE

Completion of these developments was not given top priority. Highest priority was given to the development of the program, which went into effect in 1964. The program was issued by the Department of Defense and the specifications were laid down by the Department of Defense.

conflictions and illustrating vividly the consequences of

... (b) (7) ... (c) (7) ... (d) (7) ... (e) (7) ... (f) (7) ... (g) (7) ... (h) (7) ... (i) (7) ... (j) (7) ... (k) (7) ... (l) (7) ... (m) (7) ... (n) (7) ... (o) (7) ... (p) (7) ... (q) (7) ... (r) (7) ... (s) (7) ... (t) (7) ... (u) (7) ... (v) (7) ... (w) (7) ... (x) (7) ... (y) (7) ... (z) (7) ...

1. Small samples of 1250/40mm. Lohman "Green"

Headquarters to No. 1 Clinical Investigation Unit. The

...with a minimum of exposure to the
...with a minimum of exposure to the

DECLASSIFIED BY: 6032



2011-11-11





FIG. 17 (continued). Man wearing diving suit,
underwater scene 2 (continuation).

FIG. 18 (continued). Man in diving suit, swimming,
underwater scene 3 (continuation).

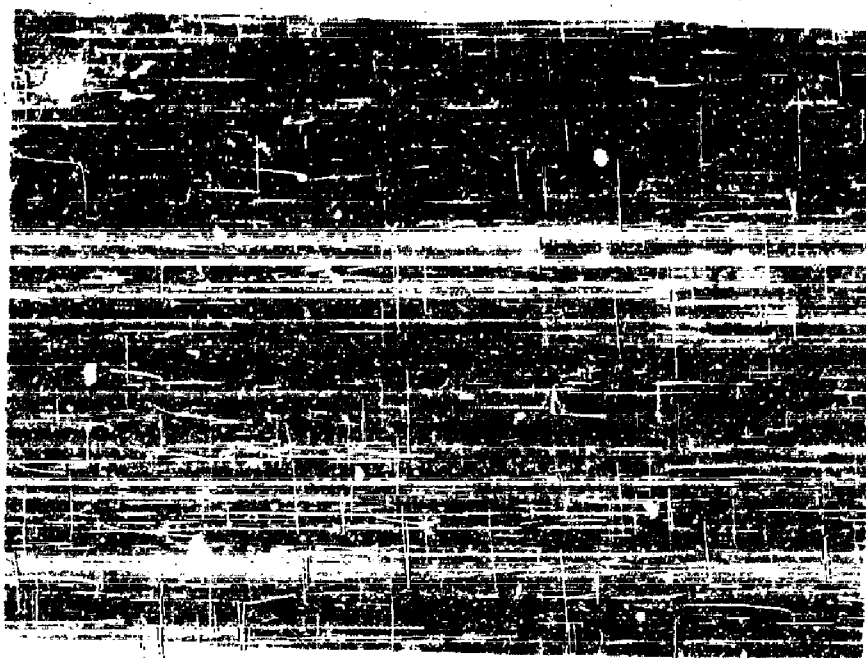




Fig. 12 (above). Man wearing ditching suit.
1957.

Fig. 13 (below). Man in ditching suit, inflating
type of device.





Fig. 1. A person in flight suit with Landing Type V

Fig. 2. A person in flight suit with Landing Type V





FIG. 1. A group of people, possibly soldiers, in a field. The image is heavily degraded with horizontal lines and noise.

FIG. 2. A group of people, possibly soldiers, in a field. The image is heavily degraded with horizontal lines and noise.



... ..

... ..

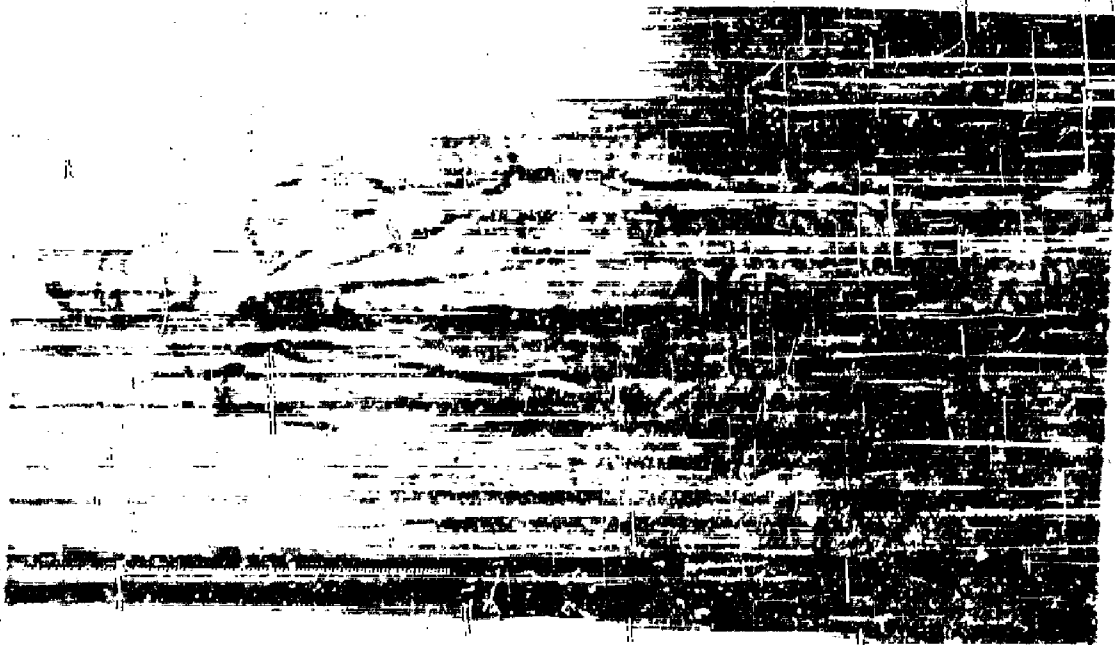
... ..

By October, 1943, there existed a general awareness of the need for developing personnel for protective work. At that time, much work was being done on the development of protective suits. On the part of the War Relocation Authority, the existing suits were being improved. The existing suits were being improved and it was realized that a new project was needed.

On the other hand, a light-weight waterproof suit of the general type had recently been developed by the War Relocation Authority. This suit was being developed for the purpose of being used in the development of protective suits.

On October 22, 1943, the War Relocation Authority was requested to develop a suit of the general type which would be suitable for use in the development of protective suits. The War Relocation Authority was requested to develop a suit of the general type which would be suitable for use in the development of protective suits.

... ..



SECRET



SECRET

(a) Even if...

...as will be after his...
...in a comparison to
...other items of...
...as provided.

...this conclusion is justified by
...functions.

(b) The... a sufficient...

...for a...
...involved in

...for members of
...all

...as
...a short period
...as his neck does
...from the effective...

...is of such... a final...

...the front and...
...to prevent
...opening
...so that the suit could
...in such a way as to...

...which appeared...
...production in...

At the request of the ... in September were tested for ... with the following results (2727).

... resistance of the fabric because the ... was at all ...

... the yellow pigment in the ... for ... later suits are ... to be satisfactory. Whether ... to a better ... or to the ... of ... in a ... pool; ... the request of ... that ... water ... up to ... in each ... differences in the ... of ... is due to ... weight loss ... than ... in the ... it is made to ... the ... these experiments were ... at the ... which ... in the ...

... Leider Park, R.A.F.

... layers of cloth are ... at ... between ... the ... the ... on the ... suit

The value of these experiments must be judged in terms of the progress made in the development of flying clothing. These experiments have shown that a flying suit must be able to protect the wearer from the elements and must be able to withstand the stresses of flight.

Miscellaneous

A large number of other articles of clothing were made and tested. The results of these tests are given in the following table. The results show that the flying suit must be able to protect the wearer from the elements and must be able to withstand the stresses of flight. The results also show that the flying suit must be able to provide the wearer with the necessary freedom of movement. The results of these tests are given in the following table.

The results of these tests are given in the following table:

Article	Material	Weight (lb)	Strength (lb)	Flexibility (lb)
Flight suit	Canvas	14	100	100
Flight suit	Canvas	14	100	100
Flight suit	Canvas	14	100	100

The results of these tests are given in the following table:

Article	Material	Weight (lb)	Strength (lb)	Flexibility (lb)
Flight suit	Canvas	14	100	100
Flight suit	Canvas	14	100	100
Flight suit	Canvas	14	100	100

The results of these tests are given in the following table:

Article	Material	Weight (lb)	Strength (lb)	Flexibility (lb)
Flight suit	Canvas	14	100	100
Flight suit	Canvas	14	100	100
Flight suit	Canvas	14	100	100

Work is still in progress. The results of these tests are given in the following table:

Article	Material	Weight (lb)	Strength (lb)	Flexibility (lb)
Flight suit	Canvas	14	100	100
Flight suit	Canvas	14	100	100
Flight suit	Canvas	14	100	100

...the
... ..
... ..

At the
... ..
... ..

Origin of Development

... ..
... ..
... ..

... ..
... ..

... ..
... ..
... ..
... ..
... ..

... ..
... ..

... ..
... ..
... ..

... ..
... ..

... ..

... ..
... ..
... ..
... ..

...of
... ..
... ..
... ..
... ..
... ..
... ..
... ..

[illegible][illegible]

REMARKS:

Perhaps the most important morphological observation obtained in this work (concerns) concerned the symptoms of collapse which occurred when the pressure was raised too high. It was in no point at all that subjects were experienced with pressures considerably higher than those which could be used for purposes of ventilation without a special pressure suit. The experiments were carried out at ground level with pressures up to 100 mm. of water. Collapse was preceded by a feeling of pressure. Usually within a minute after the pressure was raised the subject felt a pain in the chest and could not breathe. The subject was then released in a few seconds of pressure was immediately relieved. It appeared that the respiratory system was in the second stage of collapse breathing air under pressure as a stimulus stimulus of change in pressure. In the presence of some degree of anoxia the pressure required to cause collapse was less.

DATE: 10/10/1964

It was reported that an operational need to
have the equipment to train the effective killing
of pilots in the United Kingdom (U.K.). Accordingly, the
work on pressurized breathing began in the Spring and
Summer of 1944. The first tests were conducted in the
U.S. Army Air Corps, and the results were
sent to the Committee of the American Committee on
January 1945. It was found
necessary immediately to modify the equipment to suit U.S.
requirements and oxygen installations. The equipment taken
to the U.S. Army Air Corps was called E.C.A.F.

[illegible]

... ..

... ..

... ..

... ..

... ..

... ..

... ..

... ..

... ..

THE UNIVERSITY OF CHICAGO

Meanwhile, close discussions with high altitude pilots and evidence was collected concerning the physiological effects of altitude. While in the process of these discussions, some subjects reported a feeling of not being able to breathe and some definite symptoms of hypoxia were reported. There was extensive good reason to believe that some pilots could actually be entering the danger zone and that certain cases of decompression sickness were associated with high altitude flying. It was also found that certain symptoms reported with the

[illegible][illegible]

...the main (1947) ... with ... pressure, low excess ... the ... was designed ... by ... of ... to ... was disconnected ... on ... was done ... might not ... which the ... pressure

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

[illegible]

The equipment was specially approved for international use with certain minor modifications. The unit is designed for the manufacture of the most important type of this purpose the mechanical device was designed by an individual called the property of the unit is a small unit in the body of an apple of about 150 with the unit. The unit is designed for the purpose of the unit is portable and can be used in the field.

Development of work and research pursued in
the course of improving further the jacket design
has been of a highly characteristic and consistent
nature. The jacket design has been improved in
the tropical test area in 1955, 1956, and 1957.
The jacket design has also been improved on basis of
test of the structure for the jacket design.

[illegible]





Right
James Jackson
New Mexico
of the
the
the





FIGURE 1

Relationship of the Air-Cooled Pressure-Volume Diagram

FIGURE 1

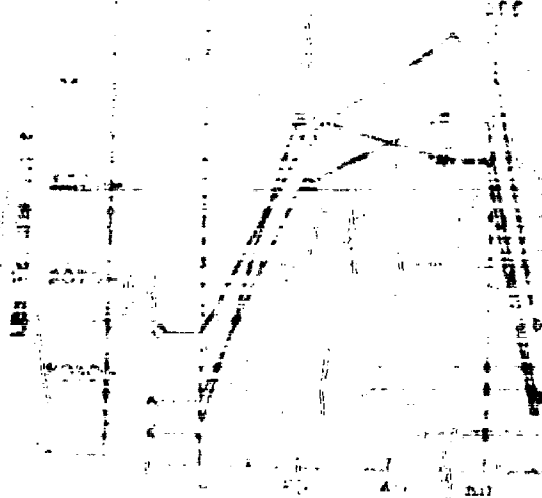


FIGURE 2

Relationship of the Air-Cooled Pressure-Volume Diagram

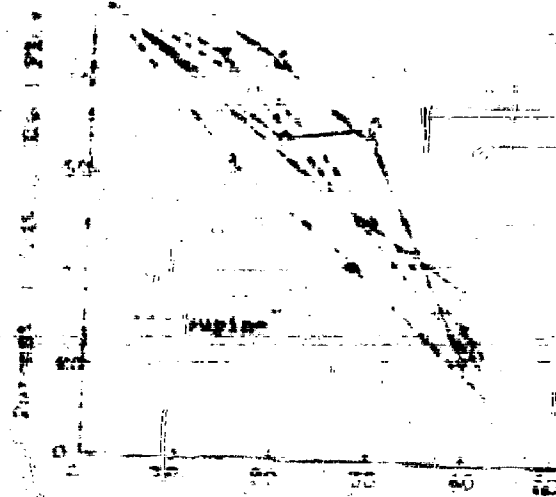


FIGURE 3

[illegible]

10401 A new instrument for the measurement of the movement of the ...

... of an
... ..
... ..

... ..
... ..
... ..

10402 The
... ..
... ..

... ..
... ..
... ..

... ..
... ..
... ..

... ..
... ..
... ..

... ..
... ..
... ..

10403 An electrical
... ..
... ..

... ..
... ..
... ..

... ..
... ..
... ..

10404
... ..
... ..

... ..
... ..
... ..

4 APR 68

MEMORANDUM FOR THE DIRECTOR

100-100000

100-100000

100-100000

100-100000

100-100000

Processing Unit

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

... ..
... ..
... ..

... ..
... ..
... ..

... ..
... ..
... ..

... ..
... ..
... ..

... ..
... ..
... ..

... ..
... ..
... ..

... ..
... ..
... ..

... ..
... ..
... ..

... ..
... ..
... ..

... ..

... ..
... ..
... ..

... ..
... ..

... ..
... ..
... ..

... ..

4-11-42

U.S. Coast Guard (P-1)
U.S. Coast Guard (P-1)

also reports that (Havens) and the
other (Havens) in (Havens)

also reports that (Havens) in (Havens)

The Breaking up of Kapok in New and
paralytic diseases on (Havens) (72)

also reports that (Havens) in (Havens)

(Havens) also reports that (Havens) in (Havens)

also reports that (Havens) in (Havens)

00400 Tailoring Patterns of Fashion Books

W. C. Calkins
1941
12/15/41

1941

1941

00410

1941

1941

1941

1941

00420

1941

1941

1. The purpose of this document is to provide information regarding the operations of the system.

2. The system is designed to provide a secure and reliable means of communication.

3. The system is capable of handling a large volume of data and is designed to be scalable.

4. The system is designed to be easy to use and is intended for use by a wide range of users.

5. The system is designed to be secure and is intended to protect the confidentiality of the data.

6. The system is designed to be reliable and is intended to provide a high level of availability.

7. The system is designed to be flexible and is intended to be able to adapt to changing requirements.

8. The system is designed to be cost-effective and is intended to provide a high level of performance at a low cost.

9. The system is designed to be easy to maintain and is intended to be able to be updated and modified easily.

10. The system is designed to be secure and is intended to protect the confidentiality of the data.

11. The system is designed to be reliable and is intended to provide a high level of availability.

12. The system is designed to be flexible and is intended to be able to adapt to changing requirements.

13. The system is designed to be cost-effective and is intended to provide a high level of performance at a low cost.

14. The system is designed to be easy to maintain and is intended to be able to be updated and modified easily.

15. The system is designed to be secure and is intended to protect the confidentiality of the data.

16. The system is designed to be reliable and is intended to provide a high level of availability.

17. The system is designed to be flexible and is intended to be able to adapt to changing requirements.

18. The system is designed to be cost-effective and is intended to provide a high level of performance at a low cost.

19. The system is designed to be easy to maintain and is intended to be able to be updated and modified easily.

20. The system is designed to be secure and is intended to protect the confidentiality of the data.

Figure 1. Schematic representation of the experimental design. The subjects were divided into two groups: the control group (CG) and the experimental group (EG). The CG was divided into two subgroups: the control group (CG) and the control group (CG). The EG was divided into two subgroups: the experimental group (EG) and the experimental group (EG). The subjects were divided into two groups: the control group (CG) and the experimental group (EG). The CG was divided into two subgroups: the control group (CG) and the control group (CG). The EG was divided into two subgroups: the experimental group (EG) and the experimental group (EG).

Figure 6. The effect of the concentration of the polymer solution on the morphology of the membrane.

*** * ***

【圖 1】

[illegible]

SECRET

[illegible]

GRAND JURY

7-11-64

100-443887-100

Figure 1

1. 1950年10月1日，中华人民共和国成立，标志着中国历史进入了一个新的纪元。

1. The first group of people who are interested in the results of the study are the researchers themselves. They want to know if the study was successful in achieving its goals and if the data collected is reliable and valid. They also want to know if the study has contributed to the field of research and if it has provided any new insights or findings.

SECRET

[Illegible text]

1. The first group of people who are interested in the study of the history of the United States are the people who are interested in the history of the United States.

1. The first step is to identify the problem or question that needs to be answered. This involves understanding the context and the specific requirements of the task.

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, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 26

2. 1940-1941

THE SECRETARY OF THE ARMY AND NAVAL DEPARTMENTS
WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
WASHINGTON, D. C.

THE SECRETARY OF THE ARMY AND NAVAL DEPARTMENTS
WASHINGTON, D. C.

THE SECRETARY OF THE ARMY AND NAVAL DEPARTMENTS
WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
WASHINGTON, D. C.

THE SECRETARY OF THE ARMY AND NAVAL DEPARTMENTS
WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
WASHINGTON, D. C.

THE SECRETARY OF THE ARMY AND NAVAL DEPARTMENTS
WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
WASHINGTON, D. C.

THE SECRETARY OF THE ARMY AND NAVAL DEPARTMENTS
WASHINGTON, D. C.

THE SECRETARY OF THE ARMY AND NAVAL DEPARTMENTS
WASHINGTON, D. C.

Figure 6.

THE UNIVERSITY OF CHICAGO

1000

[illegible]

5 // ~~XXXXXXXXXX~~

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, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 26

THE

A

W. M. L. 1000 (1900)

1990

— *Journal of the American Medical Association*, 1997

Figure 1

[illegible]

72-10

● 1994年12月1日

Journal of Management Studies, 19(1), 67-80.

... ..

4. Analysis of the Psychological Effects of the

... ..

[illegible][illegible]

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

... the world upon Japan, V.

[illegible]

10-10-68

Laboratory tests of Prototype Flight No. C-2, conducted by the Army Air Corps, Wright Field, Dayton, Ohio, on 11-12-41, showed that the aircraft was capable of flying at a speed of 1,000 miles per hour.

1990

1. 1950年10月1日，中华人民共和国成立，标志着中国历史进入了一个新的纪元。这一天，毛泽东主席在天安门城楼上向全国人民宣告了这一伟大时刻。

U.S. 1000

17

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

1. The first group of variables includes the following:

1. 凡在本行開辦之各項業務，均應遵守本行章程及各項規章制度，不得有違。
2. 凡在本行開辦之各項業務，均應遵守本行章程及各項規章制度，不得有違。
3. 凡在本行開辦之各項業務，均應遵守本行章程及各項規章制度，不得有違。

— — — — —

THE UNIVERSITY OF CHICAGO PRESS

SECRET

1. The first group of people who are interested in the study of the history of the United States are the people who are interested in the history of the United States. This group of people is interested in the history of the United States because they want to know more about the United States. They want to know more about the United States because they want to know more about the United States.

1. 凡在本行开立存款账户的客户，均可向本行申请开立定期存款账户。

TITLE: Review of the Work of the Subcommittee on Protective Clothing of the
Associate Committee on Aviation Medical Research 1942-1945

AUTHOR(S) : Kitching, J. A.; Page, E.

ORIG. AGENCY : National Research Council of Canada, Ottawa

PUBLISHED BY : (Same)

ATI- 9752

REVISION

(None)

ORIG. AGENCY NO.

SPC-197

PUBLISHING AGENCY NO.

(Same)

| DATE | DOC. CLASS. | COUNTRY | LANGUAGE | PAGES | ILLUSTRATIONS |
|----------|-------------|---------|----------|-------|--------------------------------|
| June '46 | Unclass. | Canada | English | 196 | photos, tables, diagrs, graphs |

ABSTRACT:

An account of war-research activities is given comprising three major groups of problems: the physical and chemical properties of materials used in clothing; the ability of clothing to offer physiological protection; and individual items of protection such as helmets, goggles, winter and summer suits, electrically and air-heated clothing, breathing equipment, containers for serum, and several others.

DISTRIBUTION: Copies of this report obtainable from CADO

DIVISION: Flight Safety and Rescue (15)
SECTION: Survival and Rescue (6)

SUBJECT HEADINGS: Clothing , Protective - Ventilation
(23327)

ATI SHEET NO.:

Central Air Documents Office
Wright-Patterson Air Force Base, Dayton, Ohio

AIR TECH

INDEX