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April 1961



EMO

NATIONAL DIGEST

Exercise Tocsin—1961

Blast Shelters

Effects of Nuclear Weapons

Emergency Feeding

EMERGENCY MEASURES ORGANIZATION

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PRIVY COUNCIL OFFICE

Produced By The
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THE EMO NATIONAL DIGEST, *in addition to publishing articles which reflect Canadian Government policy, also requests private individuals who have special qualifications to contribute articles on subjects of current interest to the emergency measures programme. The views of these contributors are not necessarily subscribed to by the Federal Government.*

ROGER DUHAMEL, F.R.S.C.
QUEEN'S PRINTER AND CONTROLLER OF STATIONERY
OTTAWA, 1961

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A Message from the Director:



THIS is the second issue of the EMO National Digest and I am hopeful that its contents and its appearance will appeal to all its readers. You will notice, I am sure, that the present issue makes use of a number of illustrations. It will be the policy of the Digest in future to illustrate the text where possible.

Earlier, in speaking of the general nature of this bulletin, we stated that in each issue some particular event or subject would be highlighted. In the current issue, this subject is "Exercise TOCSIN 1961". This name, used in 1960 as well, is of ancient origin and refers to the sounding of the alarm bell. It is appropriate since our national survival exercise begins this year with the sounding of the alert. The Army's national warning system will be used fully.

Exercise TOCSIN 1961 is extremely important since it should bring out any gaps or overlaps that exist in Canada's emergency plans at the federal, provincial and municipal levels. The degree of participation this year will be higher than ever, with many hundreds of municipalities engaged fully in the Exercise. There will be certain publicity in advance, explaining the purpose and meaning of the Exercise. At the time, which is in early May, following the alert by the use of sirens and otherwise, the Prime Minister will address the nation and he will be followed by most of the Provincial Premiers speaking on networks in their own provinces, and by senior officials engaged in the planning of emergency measures.

It should be known that a national exercise similar to TOCSIN 1961 will be conducted in the United States at about the same time. These exercises are used widely in all the NATO countries in order to assess the value of emergency plans.

It is hoped that all readers of this publication will be fully informed regarding the Exercise, that many will participate in some phase or other personally, and that they will help to create a widespread knowledge regarding these exercises and their purpose among the general public.

EXERCISE TOCSIN 1961

From earliest times it has been the custom of man to maintain a tocsin, or alarm signal, to warn his communities to make ready to deal with war, fire, flood or other disaster. It is perhaps appropriate, therefore, that the annual series of tests of our capability to meet the emergency situation arising from nuclear attack, be called TOCSIN. In the following article Lt. Col. D. H. Cunningham explains the objectives for 1961.

Introduction

TOCSIN 1960

THE first TOCSIN commenced at 11:00 a.m. (EDST) 3 May with the passage of an alert warning to all provinces of probable enemy attack within the next two or three hours.

The next ten hours saw many hundreds of government servants—federal, provincial and municipal, aided by large numbers of other Canadians who had volunteered for special services in their community, bend their full attention to the many and terrible problems of government and survival that might arise in Canada as a result of nuclear attack.

In federal buildings outside the Ottawa perimeter over a hundred officers of eighteen federal departments formed a nucleus of national government. From this national nucleus a network of military and commercial communications fanned out to the ten regional headquarters, one in each province, where federal and provincial civil servants worked side by side on the problems of emergency government at that level.

Below this level were the provincial services; health, police, etc., county and municipal governments, federal field offices. Over three hundred of these smaller governments participated to a greater or lesser degree in the exercise.

As this was the first of these exercises the aim was comparatively modest and the degree to which it was expected to achieve the aim, even more so. The principal value of the exercise was that it brought the components of emergency government at the national and provincial levels together for the first time. It did reveal, however, many important gaps in planning. Some of these gaps have been bridged in the year that is past. It would be most unreasonable to expect, however, to find that all these planning shortcomings will be removed by the time of TOCSIN 1961.

TOCSIN 1961

Aims

The aim of the TOCSIN series of exercises is to practise those emergency plans considered

necessary for national survival and the continuity of all levels of government and to direct attention to gaps in planning and preparation.

More specifically the aims of TOCSIN 1961 are:

- (a) To practise manning and staff procedures of emergency government.
- (b) To test emergency communications and the national survival attack warning system.
- (c) To examine problems of post-attack government and the preparation of emergency legislation.
- (d) To exercise municipal organizations and to make the general public more conscious of survival planning.
- (e) To practise where possible relocation of departments of government.

Exercise Date

It is proposed to hold the exercise over a twenty-four hour period, commencing Friday, 5 May and ending Saturday, 6 May. The exercise will involve on a national scale, federal and provincial governments, the armed forces and a large number of municipalities.

National Radio Broadcast

A necessary and most important part of TOCSIN 1961 is the testing of the national survival attack warning system. This system is operated by the Army to give warning to the country of the likelihood and imminence of attack. This year it is planned to carry the exercise alert warning to the public by the sounding of sirens wherever possible. It is further intended to immediately follow the sirens with a nation-wide radio broadcast. This programme will last thirty minutes and in addition to notifying the public that an exercise is being held will include statements on civil emergency planning by leading figures of national and provincial governments.

The first ten minutes will be on a national network and will include a message from the Prime

Minister. Then follows in each province a provincial programme, and in most cases, statements by provincial premiers. The final ten minutes will be devoted to the individual and his steps to survival in nuclear war.

Operation of Emergency Government

Coincidental with the sounding of the sirens, words will go out to hundreds of selected public servants in cities and towns from St. John's to Victoria to move and assemble at the sites chosen for emergency government.

At these sites officials will find themselves called upon to work under conditions vastly different from those to which they are accustomed. Governments with hundreds of employees and vast modern office buildings will find themselves reduced to a handful of key people and a few hundred feet of floor space. If we couple with this the pressure of time and the dreadful nature of the problems, the difficulties in the way of maintaining efficient operating standards under such conditions will readily be seen. A partial answer to the problem is to embody all possible routine activities of staffs in the form of operational procedures. Procedures for example to cover the writing, reproducing, distribution, etc. of messages and memoranda; collection, display and presentation of information, duties of staffs, etc. As it is possible to identify these routines easily even under artificial exercise conditions it is hoped to make considerable progress in this field in TOCSIN 1961.

Post-Attack Problems

The practising of staff in handling problems of emergency government is of course most important. It is difficult to achieve. This year we are setting the stage once again by an imaginary attack on Canada with nuclear weapons. This attack is "canned". That is the targets, timings, size of the attack, even the weather, were selected months ago with the intention of creating specific problem areas for governments.

What happens is this. Province "A" is told that bombs have fallen at "X" and "Y". They will be told that these bombs have caused damage to the people, their shelter, their resources, etc., to an estimated extent. In addition radioactive fallout will result to a stated extent and intensity. Province "A" and those of its municipalities, which are participating, must now work out the problems which will arise under these conditions.

Many immediate and many more long-term problems will be apparent; the homeless, the injured and the dead. Coupled with these, loss of shelter, hospital and other medical needs; feeding of the homeless, health and sanitation. At the regional headquarters of each province, federal, provincial and military teams will be working to get information, to form a full picture; to get in control of the situation again. In TOCSIN 1961 the main requirement at region in these early hours is information. At this stage, while the municipalities will be concerned more with the immediate survival problems, the regions will be striving to get a look ahead, so that they may formulate workable plans to meet the situations that will arise. At federal level, of course, almost the only activity in this first 24 hours will be the gathering of information on which to forecast more long-range plans. Such immediate problems as will arise at federal level will mainly be connected with the co-ordination of inter-provincial and inter-governmental activity and the provision of legislative authority where required.

Conclusion

It will be seen that in some respects important advances will be made in TOCSIN 1961.

The whole of the national survival attack warning system including sirens, where these have been installed, will be tested. In addition, certain aspects of emergency broadcasting will be practiced and at the same time valuable guidance on national survival will be directed to all Canadians over a national network.

In the field of emergency government the organization at national and provincial as well as in hundreds of municipalities will be assembled and examined at close range under the most realistic conditions possible.

Only those post-attack problems that arise in the first twenty-four hours will be studied. From these studies will come, it is hoped, information that will enable another step forward to be taken in the 1961-62 exercise year.

This exercise will not solve all the problems of national survival that confront us. It will, nevertheless, test and practise the capability for emergency government that now exists, and possibly more important, reveal where the weaknesses still lie and finally, it will illustrate where further steps forward can be taken.

BLAST SHELTERS

About the author:

S. N. White is a graduate of the Royal Military Academy, Woolwich, and Cambridge University. A former officer in the Royal Engineers, Mr. White is now chief of Engineering with the federal Emergency Measures Organization.

IN Blueprint for Survival No. 1, the pamphlet on basement fallout shelters, it was emphasized that the design was not for a blast shelter. It was pointed out that people who want a higher degree of protection should consider building anti-blast shelters, designs of which were being prepared.

The designers of the basement fallout shelter were consequently surprised to learn that the design was, and still is, being criticized because of its inability to withstand the blast and heat effects of nuclear weapons. If such criticism, emanating as it does from many who should know better, were not so misleading to the public, it would be ludicrous. After all, an automobile is rarely criticized for being unable to fly nor is a television berated for its inability to dry the laundry.

The fallout shelter was designed to give protection against fallout only, which is all the protection necessary over by far the greater part of Canada. This it will do, and do very effectively; but it will not, and was never intended, to do more. To achieve protection against blast and heat the problem has to be tackled from a completely different point of view. It is the purpose of this article to examine some of the problems which had to be overcome.

What does the term "blast protection" mean to you personally? Do you think in terms of standing behind a wall or lying flat on your stomach in the open? Perhaps you remember slit trenches or the street and garden shelters of the United Kingdom during the war—or the bunkers in Germany? If you do think of protection from blast in this way then you are only partially right. To understand why, you must know a little more about the nature of blast from nuclear weapons.

Many who have had experience in World War II remember the effects of blast from high explosive shells. The sudden sharp blow which would collapse buildings would also be deflected from persons sheltering in the lee of solid objects. The passage of the blast wave was so rapid that

a pocket of relatively undisturbed air would be left on the far side of such objects and it was in this area

that persons could shelter safely, provided that they were also protected from flying debris.

It is important however to realize that as the size of the explosion is increased, so also is the time of duration of the high pressure in the blast wave. For example: The duration of the overpressure* phase can vary from approximately thousandths of a second in the case of a high explosive bomb to 1/10 of a second for a 1-kiloton nuclear weapon. The duration of overpressure for a 20-megaton lasts as long as 10 seconds. These figures also vary according to the distance from the center of the explosion.

The significance of these comparisons is that in the megaton range of weapons the blast overpressures have time to envelop an object in the manner of a tidal wave, exerting pressure on it from all sides. There is therefore no sheltered lee and blast pressures can even enter into shelters through doorways and air ducts, with serious results to the occupants.

Persons may become blast casualties in three different ways. First, the blast pressure itself may cause eardrum rupture or lung collapse though rupture is unlikely to occur below overpressures of 5 pounds per square inch and lung collapse is unlikely below 15 pounds per square inch.

Secondly, the blast may turn various objects such as pieces of glass and masonry into missiles which, moving at high speeds, may cause serious injury. Finally, the force of the blast may hurl individuals against solid objects, once again causing grievous bodily harm.

We can see from the above that not only must the structure be strong enough in itself to

*Overpressure is pressure in excess of atmospheric pressure.



resist the blast, but it must also be capable of excluding blast from inside of the shelter. While it is extremely difficult to design a shelter that will guarantee complete protection no matter where it is in relation to the point of explosion, we can and do design blast shelters to resist certain levels of overpressure such as 10 pounds per square inch, 30 pounds per square inch and so on; pressures which may occur at 3 to 5 miles and 1 to 2 miles from a 5-megaton explosion respectively. The structural requirements for such shelters call for substantial steel reinforcement which is necessary to resist the impact loading of the blast wave. Naturally the doors and air ducts in such shelters must also be designed to resist corresponding pressures.

The shelter design is not finished when blast considerations alone have been taken into account, for at the distance from Ground Zero at which significant blast overpressures occur, other casualty-causing effects are also present. These are thermal radiation, initial gamma radiation, residual gamma radiation, heat and toxic combustion products from fires started by thermal radiation. So the shelter, although it is called a blast shelter, must give protection against all these effects as well. However, just as the intensity of most of these effects can be related to the level of blast pressure, so the protection against them can be related to the structural features designed to resist blast.

For instance, thermal radiation can be intercepted by the shelter structure itself. Initial and residual gamma radiation can be attenuated satisfactorily by covering the shelter with earth, or by substantially increasing the thickness of the con-

crete walls. Both these measures will also service as insulation against heat generated by conflagration. The exclusion of toxic gases can best be achieved by sealing up the shelter when necessary. This of course introduces the need for an air purification system which will remove the carbon dioxide we breath out and replace oxygen we use up. Fortunately, this is a relatively simple matter and the use of various chemicals will achieve the desired results most effectively. In addition, the period for which a shelter must be sealed up in this way is not excessive and is unlikely to exceed six or seven hours.

The reader will by now appreciate that a blast shelter has to be specifically designed for its purpose and that half measures are not likely to succeed. The Emergency Measures Organization are busy preparing for publication designs of suitable blast shelters. All the hazards referred to above have been considered and suitable and effective protective measures have been incorporated.

One group of shelters has been designed to resist hazards at the 10 pounds per square inch level and the other at 30 pounds per square inch. Some are family size and others have been designed to hold up to 30 persons. It is anticipated that the pamphlet incorporating these shelter designs will be available within the next few months.

We hope that this short explanation of a technical subject will help interested persons to understand the reasons for various features of the blast shelter design; and we feel confident that any criticism of the design will be constructive rather than misguided and uninformed.

NUCLEAR WEAPON EFFECTS

About the author:

Dr. E. E. Massey was educated at Bishop's University and McGill University, obtaining a Doctorate in Chemistry at McGill in 1933. Dr. Massey has had an extensive background in chemical research and for the past nine years has been in charge of research relative to Civil Defence with the Defence Research Board. In addition to this major responsibility Dr. Massey is also a staff officer with the Directorate of Atomic Research.

In the February issue of the EMO NATIONAL DIGEST Dr. Massey discussed the Blast Effects of nuclear weapons. In Part II the author examines Thermal Radiation Effects.



Part II

Heat Effects

SIMULTANEOUSLY with the flash explosion, considerable heat is given off. To an observer six or seven miles away from a nominal explosion, the sensation is rather like the momentary opening of a furnace door. This heat is referred to variously as thermal radiation, flash heat, or heat flash. It travels with the speed of light. Indeed, it behaves essentially like light in all respects. For a nominal 20-kiloton weapon the thermal pulse lasts about two seconds, but it causes its major damage in about the first third of a second. For very large weapons, these times are longer. The thermal radiation falling on a surface is measured in calories per square centimeter.

Because the thermal radiation is so similar to light in behaviour it can be stopped by any opaque material. Moreover, variations in atmospheric conditions—clouds, haze, fog—will modify

the heat radiation in exactly the same way they modify sunlight. Because of this it is impossible to predict exactly what will happen in any particular city if attacked; we can estimate only what is probable.

As might be expected, the larger the weapon the greater the thermal energy emitted, and at a point at any specified distance from the point of burst the total quantity of heat delivered is roughly proportional to the yield of the weapon for the same atmospheric conditions. Hence, if a nominal bomb delivers 3 cal. per sq. cm. at 2 miles from the point of burst, a ten times nominal bomb would deliver 30 cal. per sq. cm. at the same distance under the same conditions. Table I gives approximate effects for a few different size weapons.

TABLE I

Ground Burst—Visibility 3 to 30 miles, except as noted

Yield	Superficial burn	Deep burn	
1 KT	0.4 mi.	0.3 mi.	Effective for visibility
20 KT	1.6 "	0.9 "	6 miles and up
100 KT	3 "	1.8 "	Reduce values for
5 MT	16 "	10 "	visibilities below 20
10 MT	21 "	14 "	

Figures are for a surface burst weapon. In built-up areas shielding effects of buildings will reduce the distances given.

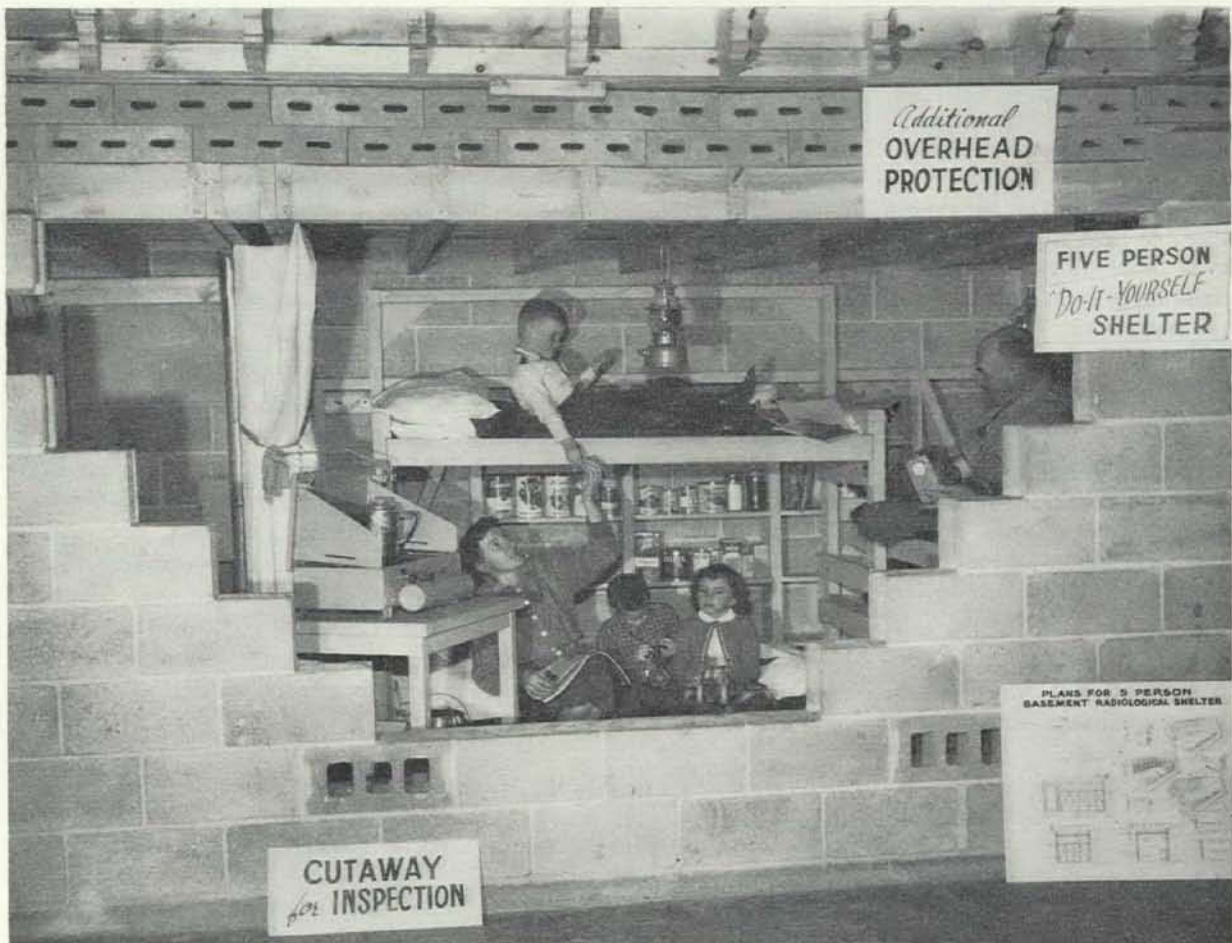
NOTE: When visibility is less than twice any value given above then that value will be reduced.

It is important to remember that the thermal radiation is stopped by any opaque material, because the application of this fact can reduce fires and physical injuries very markedly. Fires in inflammable material in building interiors can be prevented by shading the windows with venetian blinds or whitewash, even though the subsequent blast blows out the windows. Many fires can be prevented by removing inflammable trash from back yards—plain ordinary “good housekeeping” in fact. The prevention aspect of

defence against thermal effects cannot be too strongly emphasized.

Clothing affords some protection against thermal injury. At least two layers of clothing are desirable. Clothing should be loose, the outer layer should preferably be of light colour, and flame retardant treatment is advantageous.

In the June issue of the EMO NATIONAL DIGEST Dr. Massey concludes this article with a review of Radiation Effects.



Mr. and Mrs. Earl Turner are shown in the full scale basement fallout shelter used for demonstration purposes at the Canadian Civil Defence College, Arnprior. Young Geoffrey Turner tries out the top bunk while two friends, Patrick Carroll and Bonny Ritchie are seated below.

RADIOLOGICAL DEFENCE TRAINING AT ARNPRIOR

A brief description of the two new courses in Radiological Defence which are now available at the Canadian Civil Defence College is given below by Col. C. L. Smith, Commandant of the College.



THE requirement for a special course on radiological defence to train federal, provincial and local personnel has long been recognized by the Canadian Civil Defence College.

Until recently only one type of radiological course was conducted at the College. This course was of a general nature and was directed towards federal, provincial and municipal personnel who did not require detailed training in radiological monitoring or the effects of nuclear weapons. The course was of one week duration and did not include examinations. Consequently, no qualification standard could be set for graduates. To qualify an individual as an instructor in radiation monitoring it was necessary that a second College course in techniques of instruction be attended.

On the recommendation of the Interdepartmental Training Policy Committee, the Radiological Defence Courses conducted at the College have been vastly changed. The major requirements in the provinces for personnel trained in radiological defence is not only for an instructor to train local people in radiation monitoring techniques but also for the technical staff officer who will advise provincial and municipal survival authorities at his own level in regard to the effects of nuclear weapons. To meet these requirements two types of courses are now being offered at the College. The first of these is for instructors in radiation monitoring techniques and instrumentation and is known as the Radiation Monitoring Instructors' Course. The second is for the training of staff officers in radiological defence and has been named the Technical Officers' Radiological Defence Course.

The Radiation Monitoring Instructors' Course has been developed particularly for the potential

instructor in radiation monitoring procedures and is an examination course of two week's duration. For this course the prerequisites for attendance are that candidates should be either:

- (a) (i) an enrolled member of an organization for civil defence, or
- (ii) federal, provincial or municipal government employees who by reason of their employment are required to participate in civil emergency training activities.
- (b) Have attained a basic educational standard of Grade Eleven.
- (c) Candidates should have definite instructor potential.

NOTE: Special consideration should be given by Co-ordinators to the selection of full time government employees and every effort should be expended to solicit representation from industry.

The course content covers effects of nuclear weapons with particular emphasis on radiation monitoring, instrumentation, training exercises and the techniques of instruction. Attendance at the College for this course must be two full weeks as it has not been possible to divide this course into one week phases as is done in the Rescue Instructors' Courses.

The pilot course conducted in November 1960 was well attended and proved the value of the integrated radiological defence and techniques of instruction material. The authorities who sponsored the candidates were supplied with a course report form giving an appraisal of each candidate as well as the qualification level attained.

The pilot course of the Technical Officers' Radiological Defence Course was conducted in January 1961. The course content, being of a very technical nature, required that a number of scientific presentations be made by outside lecturers as well as College presentations and

practical work. The need for the very high prerequisites and standards set for this course brought together at the College candidates ideally suited for this type of work. As prerequisites for attendance candidates were required to be either:

- (a) (i) an enrolled member of an organization for civil defence, or
- (ii) federal, provincial or municipal government employees who by reason of their employment are required to participate in civil emergency planning and operational activities.
- (b) (i) graduates of a recognized university with a degree in science or engineering, or

- (ii) have five years experience as a Provincial or Municipal Radiological Defence Officer.

The examination brought forth the fact that some of the candidates of very high scholastic standing were not completely up-to-date in regard to nuclear development. Subsequent courses will cover this by additional material on nuclear matters together with the supplying of pre-course reading material to those selected to attend.

These two types of courses will be offered at the College at the rate of approximately one per month in order that the required number of instructors and technical officers can be trained to meet federal, provincial and local requirements each year.

ECONOMIC ACTIVITY UNDER NUCLEAR ATTACK—



In this, the first of two articles, R. J. Loosmore, Economic Planning Officer of the Emergency Measures Organization examines some of the economic problems which would face the nation during a national emergency.

PART I

THE economic problems which would follow a thermonuclear attack on Canada are formidable ones. The physical effects of nuclear weapons and the havoc which they would cause would in themselves be considerable, and the economic consequences would be felt far beyond the area of physical destruction. Because of the way in which different parts of the country depend on each other, areas free from weapon effects would all be hard hit economically.

Any planning to meet the economic consequences of a thermonuclear attack is conditioned by the fact that the initial economic changes would be both radical and fast.

They would be radical, because of the great amount of destruction. Blast and fire would cause casualties to the population, the destruction of resources such as factories and utilities, and the destruction of key parts of the services, such as banking, which are necessary for running the economy. The repercussions of this destruction would spread throughout the economy. For instance, the loss of key facilities for transportation, communications and power supply could have far-reaching effects through the systems concerned. The destruction of industrial plants in one place would affect the operation of plants elsewhere which depended on them for components. Destruction of the large cities could result in the loss of concentrations of skills needed by the economy throughout the country.

In addition to the destruction caused by blast and fire, the spread of fallout would have immediate economic effects. Population losses from fallout could be largely avoided by adequate shelter, but any which did occur would, of course, lower productive capacity. If fallout should immobilize an area because all the people were under cover, production would cease for the time

being. There might be some direct loss of stocks of materials or of agricultural products through contamination; other stocks might be rendered inaccessible until fallout decayed, and some of the inaccessible stocks might deteriorate in storage. There would also be a local supply problem in contaminated areas.

The economic effects of fallout would spread beyond the contaminated areas to places dependent on them for supplies. In addition, transportation, communications and power supply networks passing through a contaminated area might be dislocated, insofar as their operation depended on people working in the area.

Where fallout was heavy, there would be a long-run economic problem through the denial of ground for lengthy periods. If remedial evacuation was necessary, there would be an economic problem involved in housing the evacuated in new areas and bringing them back into economic activity.

A thermonuclear attack could change drastically the composition of the labour force in respect of its size, age, distribution, location and available skills. It is impossible to estimate such changes accurately beforehand, but clearly the changes would be of fundamental significance for all types of economic activity.

The financial results of a nuclear attack would present governments, commercial institutions and private citizens with great difficulties. Inflationary pressures might develop rapidly owing to a real or expected shortage of commodities. These pressures might be offset or even reversed by a reduction in the supply of money and credit through the destruction of currency, financial records and banking facilities. The payment of salaries, social security benefits, debts and other contractual obligations might be physically impossible for a time in some parts of the country and the effects of this would spread. Losses of life and property could create serious problems of financial com-

compensation. Governments at all levels could be faced with unusual financial liabilities at a time when the collection of taxes might be impractical in the country as a whole, or in large parts of it.

In winter, the general situation could be aggravated by adverse weather conditions. These could hamper transportation and communications, make it more difficult to repair damaged systems such as those for communications or the movement of electric power, increase the consumption of scarce fuel by all users, and greatly increase the problem of providing accommodation for the homeless.

This outline of the radical nature of the changes makes it clear that they would present a severe problem under any circumstances. The situation is aggravated by the fact that they would occur in a brief period, a matter of days. Adjustment to these changes would therefore have to be immediate. They would call for rapid administrative action, under conditions where the consequences of wrong decisions could be serious. To meet such changes, it would be necessary to have plans prepared before hand.

Such plans must be comprehensive enough to cover all eventualities and at the same time, sufficiently flexible to allow for the fact that the precise details of the situation to be met cannot possibly be foreseen. They must be worked out in peacetime, together with the machinery for implementing them.

The necessity for combining comprehensiveness with flexibility does impose on planners the need for developing general policies, which can be applied locally under widely varying conditions. It also imposes the need for planning an administrative structure which could be used for implementing such policies and for developing and training in peacetime the staff necessary for manning the administrative system at short notice in an emergency.

One example of a general policy is that, as outlined in the issue of November 1960,* it has been decided that if an attack occurred, a War Supplies Agency would immediately come into being to carry out all necessary measures in the field of supply, other than farm production and the catching and landing of fish. In addition to policy decisions of this type, which lay down wartime responsibilities, it will be necessary for all departments responsible for economic planning to prepare in peacetime the orders-in-council, administrative directives and other material needed for running the wartime system of government.

*Civil Defence—Canada.

However much planning may be done in peacetime, it would be necessary to leave the wartime agencies with considerable power to deal with local situations as they occur. A great deal would therefore depend on the people staffing them, and their capability for effective action under unprecedented conditions. If the general policies for controlling the economy are to work, it will be necessary to arrange in peacetime for the availability of people to carry them out.

The type of action needed in the economic field after a thermonuclear attack would vary according to the time after the attack at which it was taken and according to the severity of damage in the locality concerned. For the purposes of economic planning, the consequences of attack can be considered in two main time-phases. The shock phase is the period immediately after the attack. During this phase, it is assumed that normal economic activity would cease in damaged or heavily contaminated areas. This would be followed by a recovery phase, during which economic activity would be restored.

During the shock phase, the main problem would be to ensure Canada's survival as an economic entity by using the resources still available. In the damaged or heavily contaminated areas, survival operations and welfare programmes would be the predominant activities. Local resources would need to be used in a way most appropriate for immediate survival and additional resources would need to be moved in from undamaged areas as soon as possible.

However, survival by itself would not be enough; the capacity for rehabilitation and recovery would be essential. During the shock phase, a significant amount of economic activity would probably continue in undamaged areas which were either uncontaminated or lightly contaminated. Such areas would, of course, very rapidly feel the economic repercussions of destruction or immobilization elsewhere. In spite of the difficulties, every effort should be made to keep their economies going during the shock phase, so as to begin providing the basis for national recovery.

So far, this article has dealt with the general nature of the economic problems which would be likely to be encountered should Canada undergo a nuclear attack. Part II, which will be published in the June issue, will discuss in more detail some of the main fields of economic activity, such as supply, transportation, manpower and finance, in which problems are likely to arise.

FEDERAL CIVIL EMERGENCY PLANNING ARRANGEMENTS

A short Outline on the Development of the Federal Emergency Measures Organization

FEDERAL civil emergency planning in Canada began in 1938 when an Interdepartmental Committee was formed to draw up a War Book planning the activities of the various departments and agencies of government in the event of war.

In 1948 there were two developments: a new War Book Committee was set up and a civil defence organization was approved. The responsibility for the latter was divided among municipal, provincial and federal levels of government. At first the Department of National Defence assumed the federal responsibilities but these were reassigned in 1951 to the Department of National Health and Welfare.

By 1954 the threat of nuclear war began to alter Canadian plans and in 1957 the Emergency Measures Organization was approved as an element of the Privy Council Office to plan for the continuity of government in war.

A special report on civil defence was made to the Cabinet by Lieut-General Graham in 1958. This gave rise to the Government's decision to rearrange civil defence functions as outlined in Order-in-Council P.C. 1959-656 dated 28 May, 1959.

The previous concept that civil defence should be carried out by a group of volunteers assisted by government has now been revised. The new policy infers that civil emergency planning, both for survival and for the maintenance of government, is a continuing responsibility of government at all levels.

The distribution of responsibilities between the federal government and the provincial and municipal governments was outlined at a series of conferences. It was decided that the federal government would provide leadership, co-ordination, planning in certain fields and a considerable measure of financial support to the provinces and municipalities who would remain responsible for essential services to the population.

The reorganization at the federal level provided for:

- (a) A Cabinet Committee on Emergency Plans for policy decisions.
- (b) A Co-ordinating Committee comprised of senior officials of the departments and agencies most concerned with civil emergency planning.
- (c) Departmental planning staffs.
- (d) The Emergency Measures Organization with new responsibilities, both in Ottawa and in the provinces.

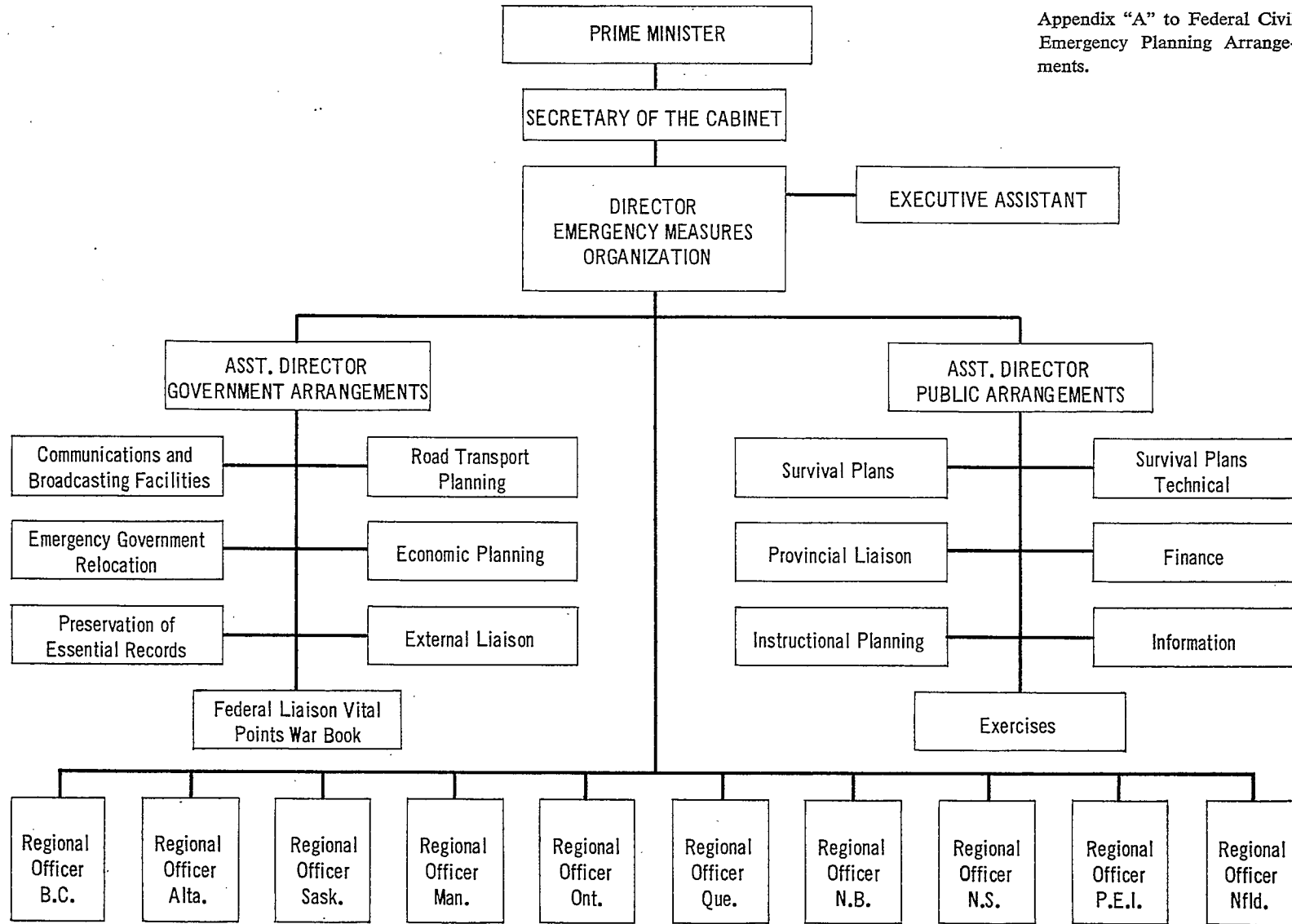
Order-in-Council P.C. 1959-656 dated 28 May, 1959, gives the Department of National Defence primary responsibility for warning and assessment of nuclear attack and for re-entry and survival operations in damaged areas. The Department of National Health and Welfare has been relieved of its former primary responsibility and now assists the provinces in the preservation of law and order. Other federal departments have varying responsibilities arising out of their normal duties.

The Emergency Measures Organization of the Privy Council Office, which had previously been charged with continuity of government planning, now has additional duties: co-ordination of federal planning, primary planning in areas not assigned to other departments in peacetime and liaison with the provinces and with other countries.

The EMO staff in Ottawa is grouped into two divisions under the Director. (*See Chart Appendix "A"*) The first deals with plans for maintaining government in emergency conditions; the second plans for the survival of individuals, families and groups in the event of war. Each EMO Regional Officer co-ordinates federal planning and provides liaison with other governmental authorities in his area.

A second article on civil emergency planning, outlining the detailed arrangement among government departments, will appear shortly in the EMO National Digest.

Appendix "A" to Federal Civil
Emergency Planning Arrange-
ments.



EMERGENCY HEALTH SERVICES

About the author:

Dr. A. C. Hardman, Director of Emergency Health Services, Department of National Health and Welfare, discusses the organization and responsibilities of the Emergency Health Services Division.



Terms of Reference

THE Minister of National Health and Welfare is responsible for planning for the continuation of the essential functions of his department under emergency government. In addition, the Civil Defence Order 1959, states that the Minister shall have and exercise the following civil defence powers, duties and functions:

- (a) assistance to provincial and municipal governments and to others in connection with the organization, preparation and operation of
 - (i) medical, nursing, hospital and public health services, and,
 - (ii) services to provide emergency accommodation, emergency feeding, emergency supplies, guidance and welfare assistance for persons who have lost or left their homes because of acts of war or apprehended acts of war and
- (b) maintenance and operation of the Civil Defence School at Arnprior, Ontario.

Emergency Health Services are the lineal successors to the Civil Defence Health Services. Now, however, in addition to the health aspects of civil defence, the Division is concerned with the continuity of essential health functions in emergency government and with the health needs of the Canadian people during the rehabilitation period. This represents a major expansion of responsibility which is as great in magnitude as the original terms of reference.

A brief summary of the duties and responsibilities of this Division follows:

- (a) To implement that portion of the civil defence powers, duties and functions assigned to the Minister, which deal with emergency health planning and operations.

- (b) To co-ordinate the planning for the continuation of the essential functions of the Health Branch in emergency government.
- (c) To study health manpower requirements of the civilian population and to co-ordinate planning for the efficient distribution of health manpower in an emergency.
- (d) To determine the requirements for essential medical and health supplies and equipment for use by civilian medical services during the emergency and rehabilitation periods. To maintain a national stockpile of essential health supplies. In co-operation with the Emergency Supply Planning Branch of the Department of Defence Production, to study and develop techniques for the production, control and distribution of health supplies.
- (e) To advise the Emergency Measures Organization (EMO) at both the national and regional levels on health matters.
- (f) To provide advice on emergency health matters including the health aspects of nuclear, biological and chemical warfare to federal government departments and agencies and to provincial governments and others.
- (g) To maintain liaison with EMO in connection with the health aspects of their NATO responsibilities.
- (h) To maintain liaison through EMO with the health officials in the United States, engaged in emergency health planning.
- (j) To give direction and assistance in the training of health personnel for their emergency health role.

Organization

Emergency Health Services are a division of the Health Services Directorate of the Department of National Health and Welfare. The detailed organization is shown in Figure 1.

Medical officers and pharmacists from other divisions of the department have been appointed as part time Emergency Health Services staff in

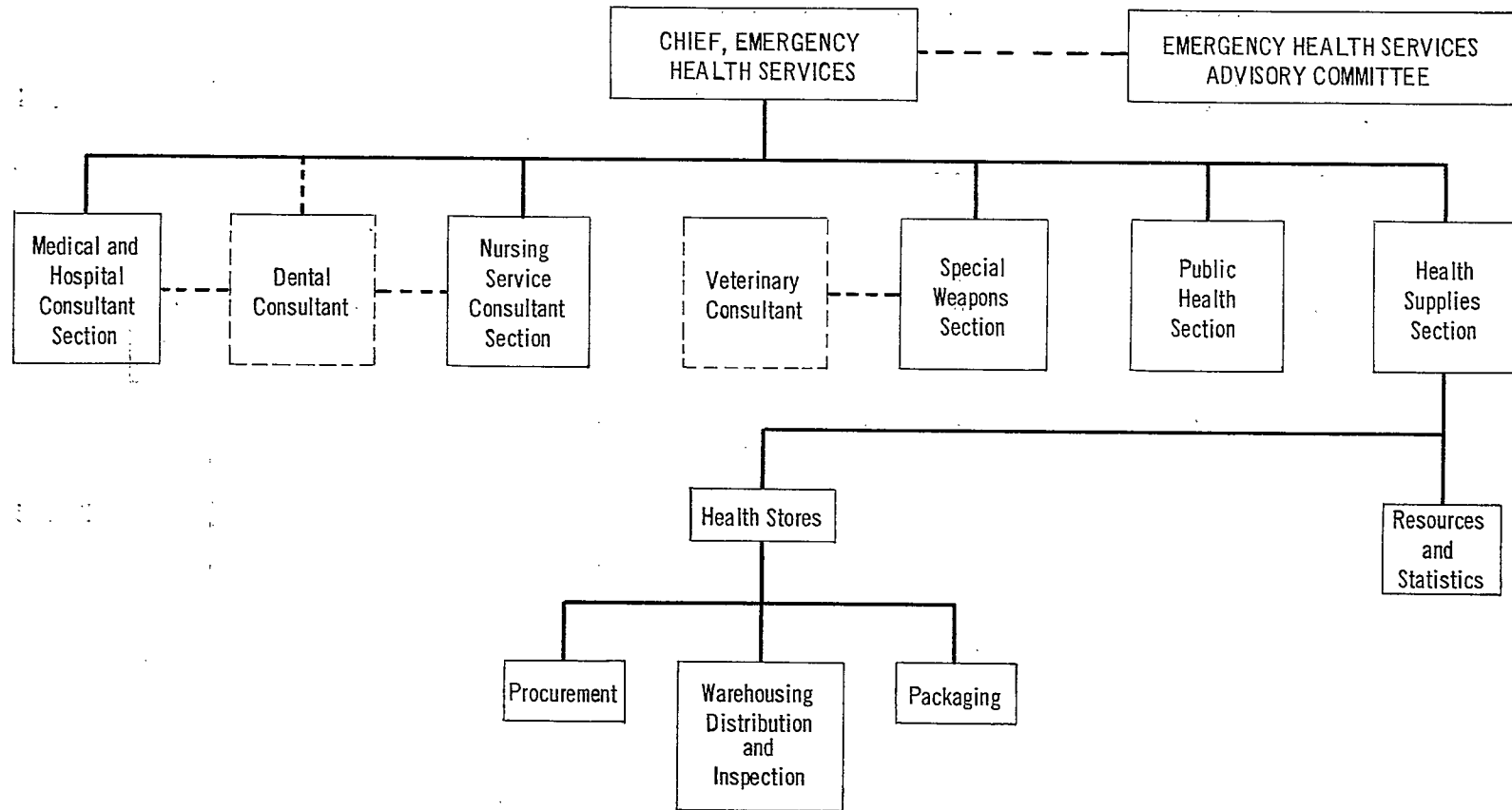
nine of the ten regions. In an emergency, these officers would assume the full duties and responsibilities of the Emergency Health Services.

The relationship of Emergency Health Services to other departments and agencies is shown in Figure 2.

The second article in this series will deal with the Health Supplies Programme and the National Medical Stockpile.

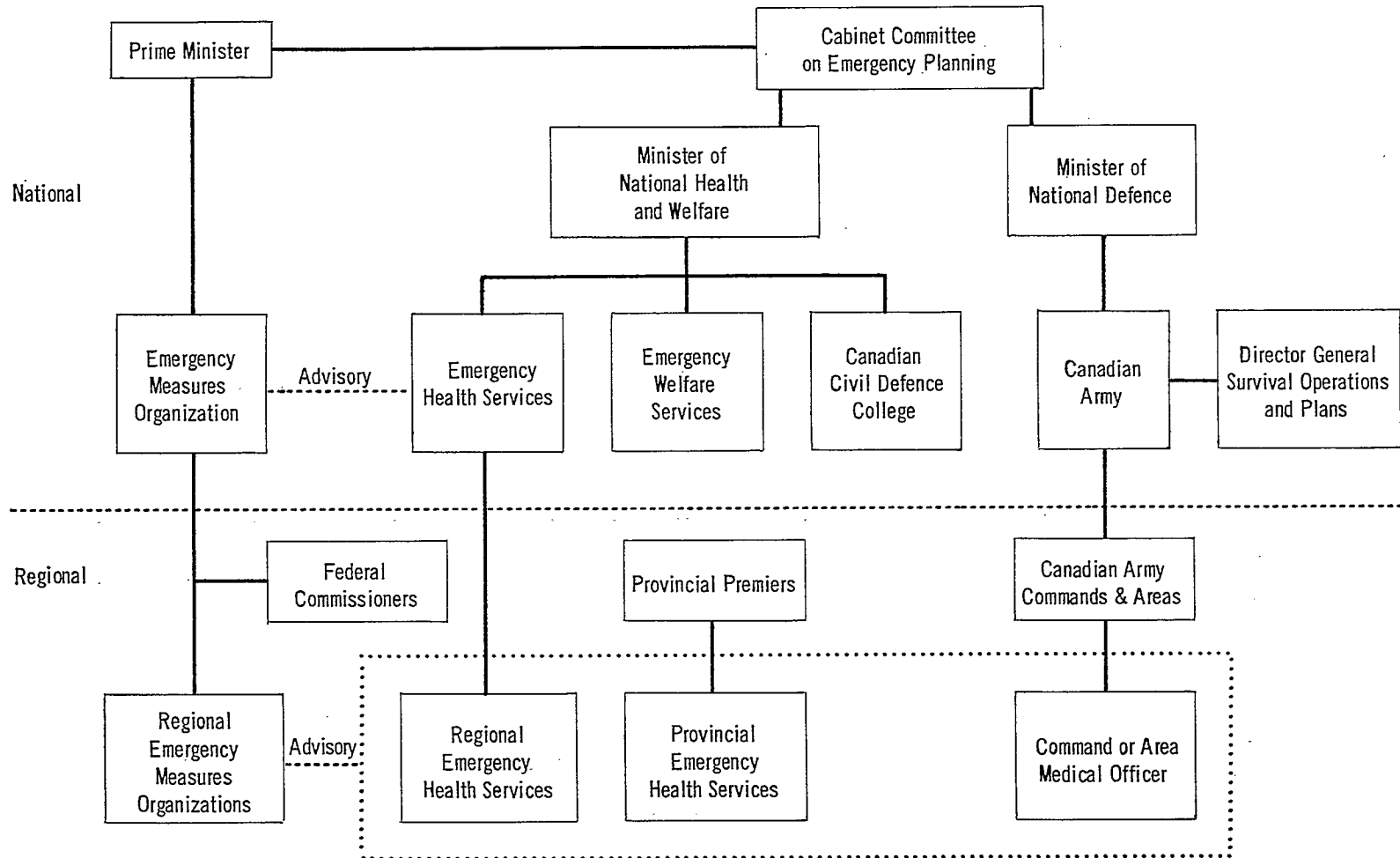
EMERGENCY HEALTH SERVICES
DEPARTMENT OF NATIONAL HEALTH AND WELFARE

Figure 1



**EMERGENCY HEALTH SERVICES
DEPARTMENT OF NATIONAL HEALTH AND WELFARE**

Figure 2



EMERGENCY FEEDING

The following article has been prepared by the Emergency Welfare Services Division, Department of National Health and Welfare.

IN the event of a nuclear attack on our country, there would be extensive destruction of homes and property, disruption of public utilities and distribution systems, as well as contamination of some areas with radioactive fallout. Vast numbers of people would move from potential target areas to other communities. Many others might be confined to shelters for varying periods. Since these people would be deprived of normal means of providing for their own existence, many would need to be provided with the basic necessities of life in order to survive.

Of all the basic needs of people, none is of greater significance than the need for food. The body's requirement for safe water is even more urgent than for food. In time of disaster, food has other functions besides merely keeping people alive. It is necessary for morale, good organization, leadership, and sound judgement, as well as for the performance of the many strenuous tasks which would be required.

Emergency feeding differs from normal feeding chiefly in the trying circumstances under which large numbers of people would have to be fed. Feeding operations could be hindered by disrupted public utilities, unsafe water, limited supplies and equipment, lack of normal sanitation facilities, or the breakdown of transportation. All these possibilities, which could occur in a nuclear war, obviously point to the necessity for pre-planning and training.

Who Will Require Emergency Feeding?

Emergency feeding would be immediately required by all those who were without means of preparing their own meals following a disaster, including:

- Evacuees—on arrival at Welfare Centres;
 - enroute, if feeding is required due to unpredicted circumstances;
 - in Congregate Lodging facilities;
- Casualties and other patients in Emergency Health Services installations;

Staff or Emergency Health Service installations;

Inhabitants and staff of improvised Welfare institutions;

Civil defence workers.

How Will Emergency Feeding Be Carried Out?

This is a problem which must be faced by all the communities across our country which would be called upon to perform this tremendous task in time of emergency. The problem can be simplified and partially solved by evacuees eating in the private homes in which they would receive emergency lodging in reception areas, with the food supply hopefully supplemented by many having brought some food with them. This is the policy on which Emergency Welfare Services is basing its planning. The implementation of this policy pre-supposes an effective food distribution system adjusted to the local supply situation.

Private feeding arrangements, however, do not eliminate the possible requirements for communal feeding for the total resident and evacuee populations in some areas, due to disrupted utilities and the difficulty of equal rationing of depleted food stocks. Communal feeding also might have to be used in some communities for groups of people in congregate lodging.

In order to prepare and serve food in all the locations and to all the groups of people requiring emergency feeding, both commercial and non-commercial feeding establishments must be organized for maximum production. Due to their lay-out, some establishments are more suitable for food preparation, and others may be more suitable for serving food. In these cases, the two operations could be separated for efficiency—with increased use of transport. If normal facilities cannot cope with the cooking involved, then improvised indoor and outdoor feeding must be established. For these, vacant buildings and protected outdoor areas could be used with the installation of simple cooking equipment.

For some groups who are isolated from feeding areas or who are too busy to come to feeding

centres, for example civil defence workers, simple mobile feeding will be required. Whatever the type of feeding used, food service must be reduced to its simplest form. This means simplified menus, continuous line feeding, streamlined service, and controlled traffic flow.

What Kind of Food ?

The question of what kind of food to serve in an emergency is easily solved, for it is obvious that whatever food is available would be used. However, canned, dehydrated, and ready-to-serve foods are ideal for emergency. Infants are one priority group which must receive immediate attention since they require safe water and milk within a few hours. One of the two basic infant formulae recommended to Emergency Feeding workers for emergency use would be satisfactory for most healthy infants. For the normal evacuee population, a hot beverage at Welfare Centres, and two simple emergency type meals per day would be sufficient for the early emergency period. Workers doing heavy jobs would require supplementary feeding. Over an extended emergency period, certain nutritional aspects would require consideration.

Self Help Measures

The first demands on emergency feeding will be considerably lessened if people have their own water and food supplies—ready for evacuation or shelter. Everyone should have a seven day, and if possible a fourteen day, supply of water and food—consisting of canned and packaged items with good keeping qualities, conforming to family appetites and preferences, and requiring little or no preparation.*

A three day Survival Kit consisting of one pound of candy (any kind except chocolate), a can of juice and can opener should be kept in readiness by all persons at work in case sudden evacuation becomes necessary.

*"Your Emergency Pack" Pamphlet prepared by Emergency Welfare Services Division.

Training of Professional Groups

Emergency feeding would not "just happen" at time of national emergency unless planning, organizing and training is carried out now in peace time. Leadership and trained personnel are essential if an efficient feeding service is to be available. Those whose training, experience and every day jobs relate to food service can give invaluable assistance in the planning stage, as well as in operational and supervisory capacities at the time of emergency.

Persons in this professional group, consisting of dietitians, nutritionists, home economists, and restaurant and catering managers, receive training by attending Emergency Feeding Courses which are conducted by the Emergency Welfare Services Division at the Canadian Civil Defence College, Arnprior. They are presented with information about the threat which is involved and the necessity to assess their own role in time of emergency.

Ways and means of feeding people in an emergency are considered—with emphasis placed on the development of plans for their own restaurant, hospital, or school as part of the overall community planning which is required.



A typical scene at an Exercise during an Emergency Feeding Course at the Canadian Civil Defence College, Arnprior.

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