

**CIHM
Microfiche
Series
(Monographs)**

**ICMH
Collection de
microfiches
(monographies)**



Canadian Institute for Historical Microreproductions / Institut canadien de microreproductions historiques

© 1997

Technical and Bibliographic Notes / Notes techniques et bibliographiques

The Institute has attempted to obtain the best original copy available for filming. Features of this copy which may be bibliographically unique, which may alter any of the images in the reproduction, or which may significantly change the usual method of filming are checked below.

- Coloured covers / Couverture de couleur
- Covers damaged / Couverture endommagée
- Covers restored and/or laminated / Couverture restaurée et/ou pelliculée
- Cover title missing / Le titre de couverture manque
- Coloured maps / Cartes géographiques en couleur
- Coloured ink (i.e. other than blue or black) / Encre de couleur (i.e. autre que bleue ou noire)
- Coloured plates and/or illustrations / Planches et/ou illustrations en couleur
- Bound with other material / Relié avec d'autres documents
- Only edition available / Seule édition disponible
- Tight binding may cause shadows or distortion along interior margin / La reliure serrée peut causer de l'ombre ou de la distorsion le long de la marge intérieure.
- Blank leaves added during restorations may appear within the text. Whenever possible, these have been omitted from filming / Il se peut que certaines pages blanches ajoutées lors d'une restauration apparaissent dans le texte, mais, lorsque cela était possible, ces pages n'ont pas été filmées.
- Additional comments / Commentaires supplémentaires:

L'Institut a microfilmé le meilleur exemplaire qu'il lui a été possible de se procurer. Les détails de cet exemplaire qui sont peut-être uniques du point de vue bibliographique, qui peuvent modifier une image reproduite, ou qui peuvent exiger une modification dans la méthode normale de filmage sont indiqués ci-dessous.

- Coloured pages / Pages de couleur
- Pages damaged / Pages endommagées
- Pages restored and/or laminated / Pages restaurées et/ou pelliculées
- Pages discoloured, stained or foxed / Pages décolorées, tachetées ou piquées
- Pages detached / Pages détachées
- Showthrough / Transparence
- Quality of print varies / Qualité inégale de l'impression
- Includes supplementary material / Comprend du matériel supplémentaire
- Pages wholly or partially obscured by errata slips, tissues, etc., have been refilmed to ensure the best possible image / Les pages totalement ou partiellement obscurcies par un feuillet d'errata, une pelure, etc., ont été filmées à nouveau de façon à obtenir la meilleure image possible.
- Opposing pages with varying colouration or discolourations are filmed twice to ensure the best possible image / Les pages s'opposant ayant des colorations variables ou des décolorations sont filmées deux fois afin d'obtenir la meilleure image possible.

This item is filmed at the reduction ratio checked below / Ce document est filmé au taux de réduction indiqué ci-dessous.

10x		14x		18x		22x		26x	30x	
							✓			
	12x		16x		20x		24x		28x	32x

The copy filmed here has been reproduced thanks to the generosity of:

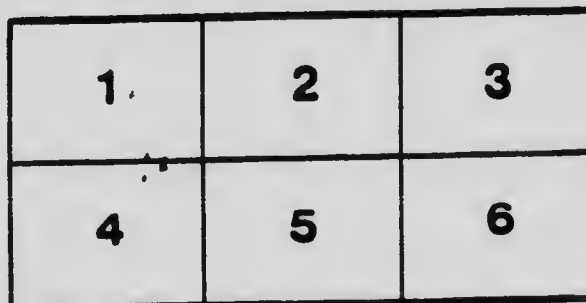
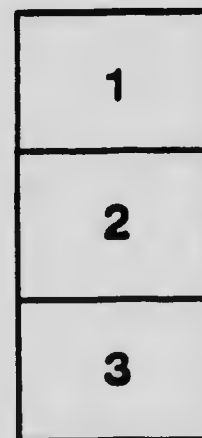
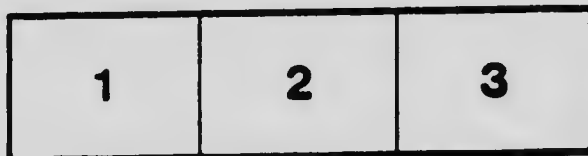
National Library of Canada

The images appearing here are the best quality possible considering the condition and legibility of the original copy and in keeping with the filming contract specifications.

Original copies in printed paper covers are filmed beginning with the front cover and ending on the last page with a printed or illustrated impression, or the back cover when appropriate. All other original copies are filmed beginning on the first page with a printed or illustrated impression, and ending on the last page with a printed or illustrated impression.

The last recorded frame on each microfiche shall contain the symbol \rightarrow (meaning "CONTINUED"), or the symbol ∇ (meaning "END"), whichever applies.

Maps, plates, charts, etc., may be filmed at different reduction ratios. Those too large to be entirely included in one exposure are filmed beginning in the upper left hand corner, left to right and top to bottom, as many frames as required. The following diagrams illustrate the method:



L'exemplaire filmé fut reproduit grâce à la générosité de:

Bibliothèque nationale du Canada

Les images suivantes ont été reproduites avec le plus grand soin, compte tenu de la condition et de la netteté de l'exemplaire filmé, et en conformité avec les conditions du contrat de filmage.

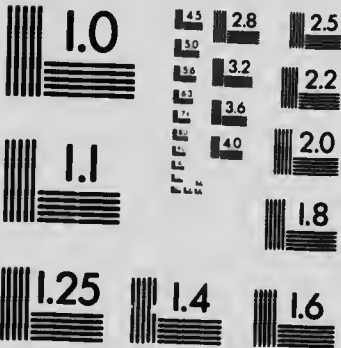
Les exemplaires originaux dont la couverture en papier est imprimée sont filmés en commençant par le premier plat et en terminant soit par la dernière page qui comporte une empreinte d'impression ou d'illustration, soit par le second plat, selon le cas. Tous les autres exemplaires originaux sont filmés en commençant par la première page qui comporte une empreinte d'impression ou d'illustration et en terminant par la dernière page qui comporte une telle empreinte.

Un des symboles suivants apparaîtra sur la dernière image de chaque microfiche, selon le cas: le symbole \rightarrow signifie "A SUIVRE", le symbole ∇ signifie "FIN".

Les cartes, planches, tableaux, etc., peuvent être filmés à des taux de réduction différents. Lorsque le document est trop grand pour être reproduit en un seul cliché, il est filmé à partir de l'angle supérieur gauche, de gauche à droite, et de haut en bas, en prenant le nombre d'images nécessaire. Les diagrammes suivants illustrent la méthode.

MICROCOPY RESOLUTION TEST CHART

(ANSI and ISO TEST CHART No. 2)



APPLIED IMAGE Inc

1653 East Main Street
Rochester, New York 14609 USA
(716) 482 - 0300 - Phone
(716) 288 - 5989 - Fax

CA 3 1905. 110
220

DOMINION OF CANADA
DEPARTMENT OF AGRICULTURE
DOMINION EXPERIMENTAL FARMS

DIVISION OF CEREALS

THE USE OF COARSE GRAINS FOR HUMAN FOOD

BY

CHAS. E SAUNDERS, B.A., Ph.D.,
Dominion Cerealist



BULLETIN No. 40

(SECOND SERIES)

Published by Authority of The Hon. The Minister of Agriculture,
Ottawa, Ontario
1919.

DOMINION OF CANADA
DEPARTMENT OF AGRICULTURE
DOMINION EXPERIMENTAL FARMS



DIVISION OF CEREALS

THE USE OF COARSE GRAINS FOR HUMAN FOOD

BY

CHAS. E SAUNDERS, B A , Ph.D.,
Dominion Cerealist

BULLETIN No. 40

(SECOND SERIES)

Published by Authority of The Hon. The Minister of Agriculture,
Ottawa, Ontario

1919.

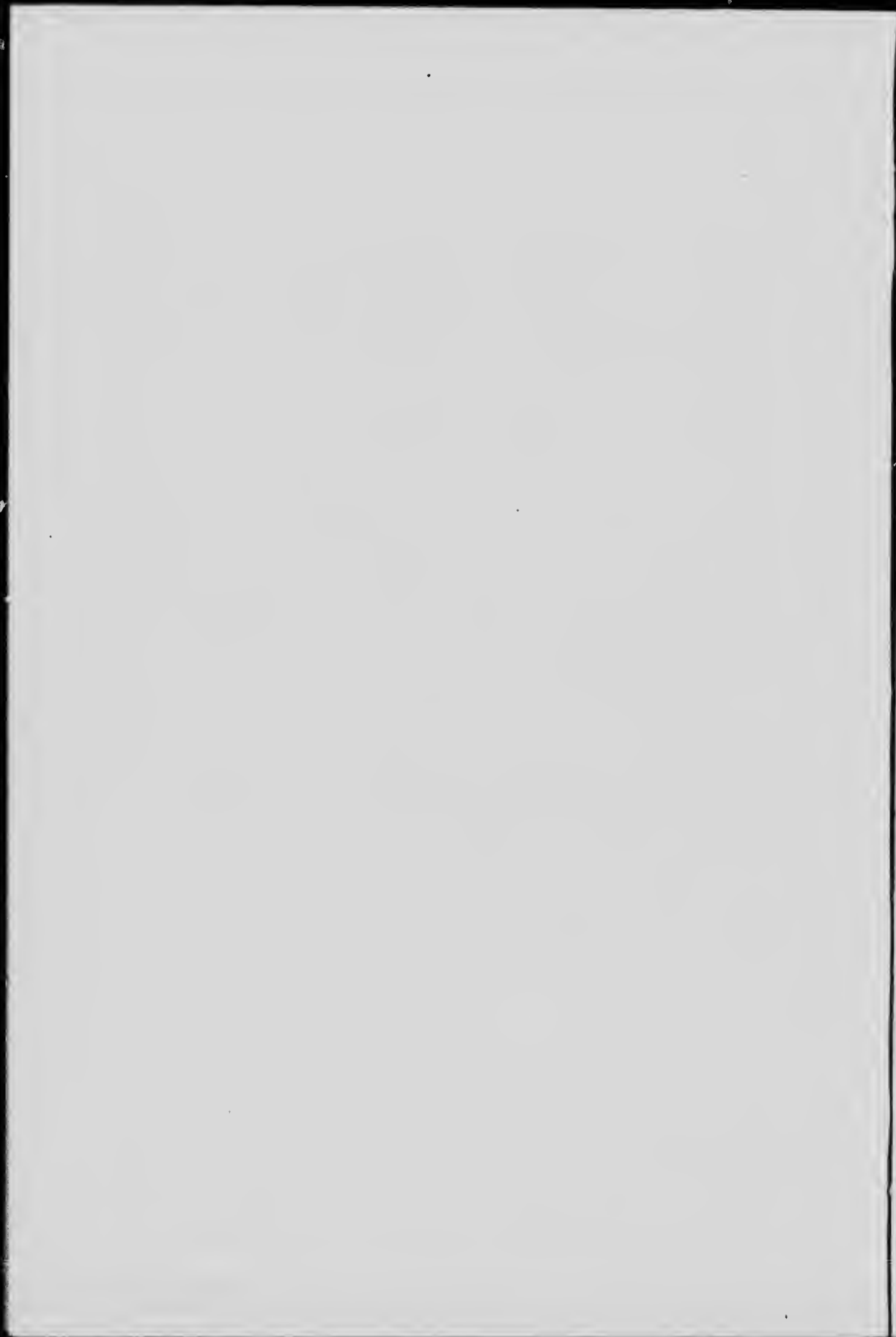
64092-1

00110000

09501496

TABLE OF CONTENTS.

	PAGE.
The need of coarse food in human diet.	7
Wheat.	10
Oats.	10
Barley.	11
Rye.	12
Indian Corn.	12
Peas.	12
Beans.	13
Recipes.	13
Mills.	15



OTTAWA, June 7, 1919.

The Honourable,
The Minister of Agriculture,
Ottawa.

SIR,—I have the honour to submit herewith, for your approval, the manuscript of Bulletin 40 of the Second Series, entitled "The Use of Coarse Grains for Human Food."

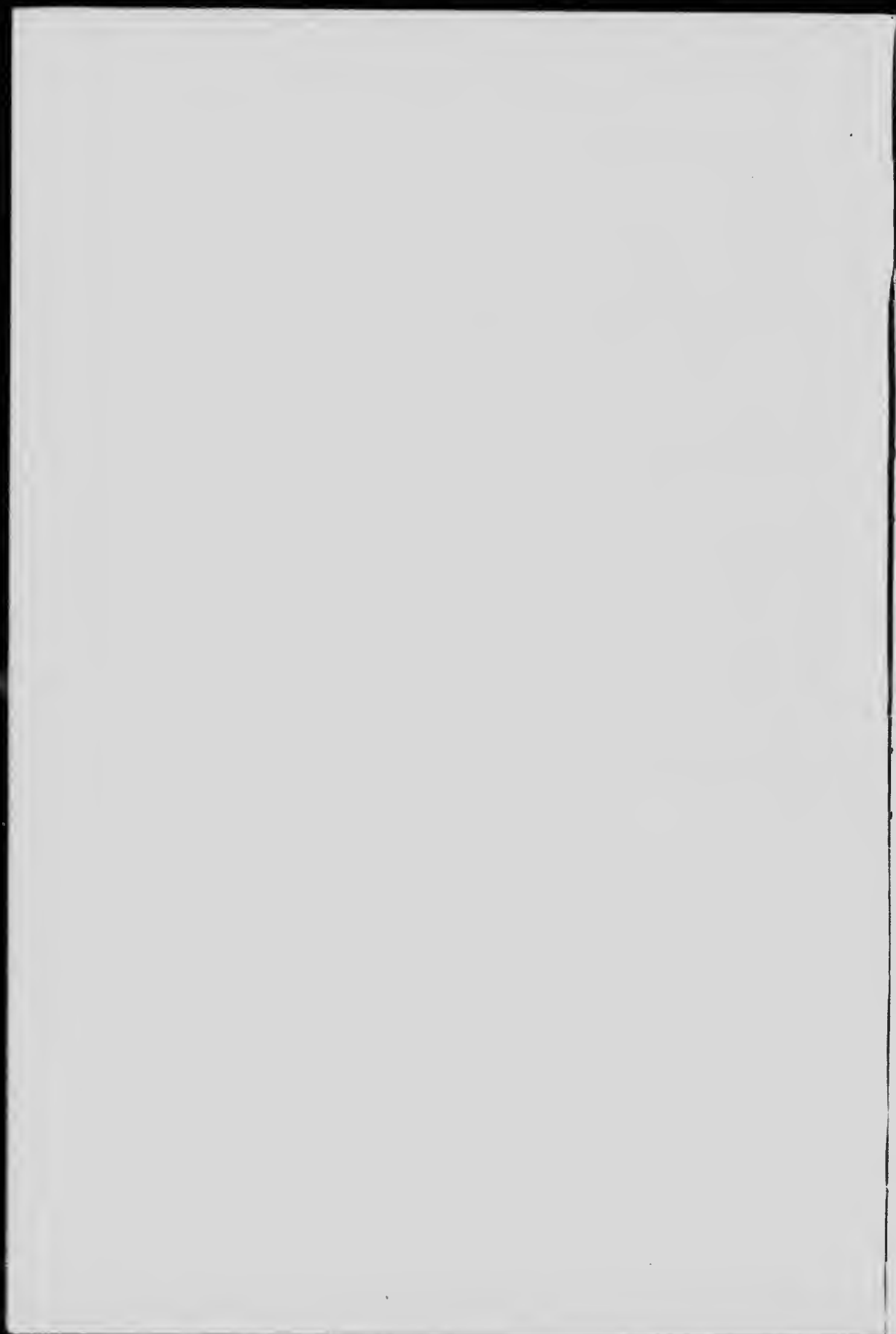
In this bulletin the Dominion Cerealists treats, in a most interesting way, of the possibilities and advantages of adding to the human diet various articles of food prepared from our coarse grains, and gives a number of recipes for preparing these which he has personally tested.

The information given, if followed, should be of benefit to the general health of the community, should aid the effort to reduce the cost of living and should be of special value to those sections of our population living remote from sources of supply and hence anxious to be as independent of them as possible.

I have the honour to be, sir,

Your obedient servant,

F. S. ARCHIBALD,
Director, Dominion Experimental Farms.



THE USE OF COARSE GRAINS FOR HUMAN FOOD.

By CHAS. E. SAUNDERS, B.A., Ph.D., *Dominion Cerealist.*

The object of this bulletin is two-fold, first to show to farmers generally, but especially to those in remote settlements, how they can become more nearly self-sufficient, so far as the food supply for themselves and for their families is concerned, and second, to point out, for the benefit of other classes of people, some ways of economizing in the cost of their food, and of improving at the same time the wholesomeness of their diet. Such a publication is particularly timely at the present juncture. It is desirable to encourage agriculturists in all districts, particularly those whose position is rather isolated; and it is quite essential to assist all classes of the community to practise the utmost possible economy.

In the early history of mankind, food was undoubtedly often consumed in very coarse condition. While certain disorders of the alimentary tract may be considered characteristic of highly civilized people, fed on dainty and carefully prepared products, it is probable that primitive man had other digestive difficulties to contend with, due to the coarseness of his vegetable food, and its comparatively low nutritive value.

As civilization advanced, and as mankind became conscious of the somewhat unsatisfactory quality of the foods available, steps were taken to free them from part of the crude, fibrous matter, which they contained. In modern times these processes have been carried so far that we have at last reached a stage where most people consume too large a proportion of refined material and too little of the necessary, coarse and relatively indigestible substances. This fact is particularly conspicuous when we consider the uses which are now made of wheat and other cereals. Modern machinery has been so much improved that it is possible to separate very accurately the ground products, so that each portion of the grain is obtained almost entirely free from any other parts. We are apt to regard these carefully separated portions as purer than the coarser materials which our ancestors ate, but the word "purer" should not be used in this connection at all. Wheat flour containing a considerable quantity of ground bran may be quite as pure as the most accurately separated white flour, even though the former be darker in colour. Furthermore, it does not at all follow that the most complete separations furnish the most wholesome foods. Indeed, quite often the reverse is true; for, as is well known, the best possible health requires a varied diet. The natural desire for foods in a high state of purity and of excellent nutritive value finally led the public a good deal astray, both because appearance is not a safe guide as to quality, and because our knowledge of the problems of human nutrition was, and still is, too incomplete to enable us to pronounce authoritatively as to the relative values of various materials. Greater purity was estimated usually by a more pleasing appearance, and this naturally led to too great emphasis being placed on the colour and refinement of edible products. Not only was it considered that these must be free from dirt and other objectionable extraneous matter, but they must be attractively prepared and put up, and must conform to certain, often very arbitrary, standards as to colour and other characteristics. Hence followed the practice of bleaching and the use, on a rather large and sometimes dangerous scale, of artificial colouring matters, preservatives and adulterants. Although the amount of sophistication of food materials was never anything like as great as the public has been led to believe, a good deal of it occurred. Lately, however, people have become alarmed, some steps have been taken to safeguard the welfare of the community, and a decided reaction has begun against what may be fairly called the over-purification of foods.

The public must necessarily judge food very largely by the eye. Green coloured apples are difficult to sell, even when of fine quality, but a bright red apple will usually fetch a good price because it looks superior, even though the actual flavour may be but little better than that of a turnip. Almonds in the shell are bleached with sulphur fumes to make the shells pale, as if the pale colour of the shell were an indication of high quality of kernel. The reverse is more likely to be true. Rice, in order to make it attractive, has to be coated with glucose and powdered talc by which it gets a fine gloss. Pearl barley is also sometimes faced with talc. Butter must be yellow to please the purchaser, and is therefore frequently coloured with a yellow dye. But the public demands wheat flour in as white a form as possible and hence it has often been bleached to remove its natural yellow tint.

Common sense is not very conspicuous in some of these demands of the public, but every one must sympathize with the desire to have all food products of clean appearance and handled and offered for sale in a careful and cleanly manner. We must not attempt to say, however, just what degree of refinement in any food product is really the most wholesome. Some serious mistakes have been made and unnecessary expense has been incurred in supposed purification. Desirable ingredients of foods have sometimes been lost in this way, and more or less objectionable chemicals have been added to the food without any corresponding advantage to the consumer.

The inevitable reaction against too much artificiality in foods set in a few years ago, and has gone to extremes in some cases. But the majority of our people have scarcely yet been sufficiently influenced by it. The bogies of "adulteration," "substitution," "bleaching," and "falsification" are often heard of, and any demagogue can catch the public ear when he discusses such subjects almost as readily as when he speaks of "profiteering"; that is to say, profits made by other individuals than himself. So-called "purification" has certainly been seriously overdone, and a return to coarser and more natural forms of food is desirable for several reasons. We need not, however, become fanatical on the subject. Foods in Canada are very pure and carefully prepared, and the writer would not endorse the "back-to-nature" cry on the ground that our foods are as a rule in the least degree unwholesome. The greater part of what has been said about over-refinement and adulteration of foods is false; yet the adverse criticisms of modern products cannot be entirely dismissed. Some of them have a foundation in fact. We are getting a little too far from nature, and the modern saying, "A salad a day keeps the doctor away," is timely if not quite true. This saying, by the way, varies in form, and the word "apple", "orange", "banana", or "carrot" might be substituted for "salad". The latter, however, is a particularly good word in this connection, because a salad includes various uncooked fruits and vegetables. We all require a certain amount of natural, raw food and the best health cannot long be maintained, much less can satisfactory growth be secured, when we are fed entirely on a limited diet, almost free from coarse and uncooked products.

The main nutritive requirements of the human body are, as has long been known, protein, carbohydrates and fat, but in addition to these, small quantities of various mineral and other constituents must also be taken. Only recently it has been recognized that certain bodies (to which the name "vitamines" has been given) which are absolutely essential to growth and health, are present in very varied proportions in different foods. Further, it is generally recognized that, for mechanical reasons, a certain amount of coarse material must be eaten in order to aid assimilation, and to prevent constipation which is so common a complaint, especially among people of sedentary habits. The proper development of the teeth and jaws, and particularly of the palate, in growing children undoubtedly depends not only on obtaining a sufficient quantity of mineral matter in the food, but also on the proper exercise of the muscles in mastication. To a certain extent this need for activity is perceived by young people, whose desire to chew gum is not altogether as illogical and absurd as

it may seem; but it is surely much more desirable to meet their requirements by furnishing in their diet a sufficient quantity of material which requires diligent chewing rather than to provide them with artificial means, of doubtful aesthetic value, for the proper exercise of the muscles. Vitamines, valuable mineral constituents and crude fibre are partly eliminated from our foods by too much refining.

Health should be regulated as far as possible by diet, and until a great deal of further information has been obtained, the only sane and safe policy is to eat a great variety of foods, some of which (though not necessarily the cereals), should be uncooked, and to be careful to take a large enough amount of rather crude material to keep the body in good order. In an economical and wholesome dietary, vegetables and fruits both raw and cooked should certainly occupy a rather larger place than they usually do at present, but there is also great need, especially when the question of cost is being considered, to use a certain proportion of coarse grains such as oats, barley, rye, peas and beans, besides perhaps utilizing more of the coarser parts of the wheat kernel than are generally consumed at the present time. The writer has no sympathy with the ridiculous tirades which have been indulged in against highly purified wheat flour, which is certainly one of the very best, purest, cheapest, and most wholesome of all food products, notwithstanding anything that has been said against it. It is, however, not an ideal food, as it does not contain all that is needed for the human body. But there is no object in seeking an ideal food, for it is both more natural and more pleasant to eat a variety of foods and thus to make up for the deficiencies of each by the special good qualities of some other. It is no argument against an article in our diet to say that it will not by itself support life very long. Nor, in comparing two articles, should one conclude that that one is best which would *alone* support life the longest. We do not require the best single food, but the best combination of foods. There is no reason whatever to set up the claim that the whole of the wheat kernel should be eaten. No one would insist on the eating of a whole peach, including the skin and stone, or a whole fish, including the bones and entrails. We have as much right to select the parts of a wheat kernel which we wish to eat as to select the parts of a peach or a fish; but in the case of the wheat kernel, the selection is not so easy or obvious and should be made only after careful experiments have shown what is the best course. In a diet consisting chiefly of fruits, coarse vegetables and bread, the latter would probably (almost certainly) prove most satisfactory if it were made from highly purified wheat flour,—as concentrated nourishment as possible. But with a diet consisting almost exclusively of eggs, milk, butter, cheese and meat, it would probably be best to use only very coarse bread, containing nearly as much bran as is naturally present in the wheat kernel. Every article of diet must be considered as part of a system, and the quantity of each which should be taken will depend on the nature and on the quantities of the other foods consumed.

While wheat is not usually included in the term "coarse grains", some references to it will be made in this bulletin, although the prime object here is to call attention to some cheap, economical and particularly wholesome foods which have hitherto received very little attention. In the ordinary household the coarser part of wheat are seldom used, oats are almost unknown except in the form of oatmeal, which is not made from whole oats, and which is eaten as a rule in small quantities once a day or less often. Barley when used at all is in the form of pearl or pot barley, from which the outer coatings have been removed. Rye is scarcely ever eaten, and corn, peas and beans are much less employed than they should be.

There is altogether too much conservatism in the attitude of most people towards new foods. Many of us never pass the childhood stage where we refer to our own ordinary diet as "proper meat" and think that other people have "curious things to eat". Indeed it is not uncommon to consider that those whose diet differs from ours are not altogether sane in the choice of their food; hence ridicule is often thrown on the Chinese for eating rice, the English on account of their roast beef, the Scotch for their oatmeal, the Irish for their potatoes, the New Englanders for their soggy,

brown bread and the French Canadians for their pezs. Instead of ridiculing the favorite foods of other races, it would be much wiser to adopt them as far as possible, and we should be better off in many instances if we ate some of the "curious things" often enough not to regard as odd at all.

It is the hope of the writer that this bulletin will serve a useful purpose in calling attention to some particularly wholesome and economical cereal foods which should be found on our tables, and which can nearly all be obtained without much difficulty, even though some of them are not at present offered for sale by ordinary dealers.

WHEAT.

This cereal has certain advantages over all the others which make it particularly attractive, and on that account it has won a deserved popularity and is even used to excess. It requires less care and initiative to produce good foods from wheat than it does to employ a variety of cereals, even though the latter plan be much better for health.

Some of the most valuable constituents of wheat are situated in the outer layers of the kernel just under the bran proper, and it is a very interesting question how much of the wheat kernel should be included in the ordinary diet of human beings. The subject is not appropriate for discussion in this bulletin and it may therefore suffice to remark that the whole wheat grain when ground in a hand mill produces meal of rather too coarse quality for regular use (except in small amounts) and that a certain degree of separation of the bran is essential if one desires to make ordinary bread. Such separation is impracticable when a small mill is used. In regular flour-making the entire elimination of the bran is commonly aimed at, although a limited quantity of this substance may advantageously be eaten by many people whose diet is of very restricted range. Bran is, however, rather indigestible and rather irritating in its ordinary flaked condition and should not be taken in excess. The so-called "whole wheat" flour does not contain the whole of the wheat and ordinary rolled wheat is also a partial wheat product, as some of the bran is removed before the grain is rolled. Shredded wheat, however, contains the whole of the wheat and proves that when bran is finely enough ground it makes good food.

Coarsely ground or finely ground whole wheat can be used instead of any other grain mentioned in the recipes given in the next section of this bulletin, but it would be more desirable as a rule, from the point of view of diet, not to use wheat in the ways there described. Most of us take too large a proportion of this cereal in our daily food, so that it is advisable to devise methods for using less of this and more of other grains, rather than to point out new possibilities in the use of wheat. It would be a pity to lose white bread out of our diet and there is no reason why we should do so if we are careful not to eat it to the exclusion of proper amounts of coarser foods. However, if we were at any time deprived altogether of wheat flour it would be worth while, if any kind of hand or power grinder were available, to use a certain amount of ground wheat for porridge, and also to make tea biscuits and cookies from very fine meal, if the other necessary ingredients could be obtained. For suitable recipes see the next section of this bulletin.

OATS.

Next to wheat, Canadians undoubtedly use as food more oats than any other grain, although the quantity consumed is not large; for scarcely any one, except a small number of people of Scotch origin, employs this cereal in any other form than as porridge. While ordinary rolled oats and oatmeal make excellent porridge, the writer has found that the hullless or naked oat, such as the variety called Liberty, Ottawa

480, which he has recently introduced, furnishes a product of distinctly higher flavour than anything obtainable commercially. The reason of this probably is that when the hull is removed from the ordinary oat the skin is also taken off, and that in or near the skin the best of the flavour is located. This is a supposition only, but seems a plausible way of explaining the superior quality of the ground hulless oats. These oats as they come from the threshing machine are free from hulls except for a few kernels which owing to unripeness or some other cause loosely retain their hull. By suitable treatment these can be separated out and a product obtained quite free from hulls and chaff. This has only to be ground in an ordinary hand mill to make excellent meal. Hulless oats have long been used as an important article of diet in some parts of China, but up to the present they are almost unknown in Canada. It is hoped, however, that the introduction of such a good variety as the Liberty will stimulate the growing of this valuable cereal. Farmers in outlying districts are strongly recommended to secure some of the seed and to grow this oat both for family use and for feeding to young animals.

There is probably no cereal product which can be produced entirely on the farm without the aid of complicated machinery, which is more desirable or valuable than the ground, hulless oat. Not only does it make porridge of the finest quality, but it is also excellent when baked in the form of oatcake or cookies.

BARLEY.

Extremely little barley is used in Canada as human food, and there is no reason why the quantity should not be largely increased. Barley is sold almost exclusively as pot or pearl barley, which gives the purchaser the inner part only of the barley kernel, the hull, skin and outer parts having been worn off by machinery. The process of preparation is lengthy and requires a good deal of power, and hence the cost of the pearl barley is rather high, especially as the amount manufactured is small. Doubtless if it were produced on a larger scale it could be made somewhat more cheaply. It is rather surprising that in a country where so much rice, certainly one of the most tasteless of foods, is eaten, so little pearl barley should be consumed, as this can be employed for every purpose for which rice is used and, in the opinion of the writer at least, produces far more tasty dishes. Pot or pearl barley can, of course, be ground in a hand mill, and will thus furnish good material for porridge or other purposes, but this would be neither a cheap nor a coarse food and could not be classed in the same group with hulless barley. Ground barley under the name "Cream of Barley" has lately come into notice. This is very good, but being a purified, milled product, does not need special consideration here.

Hulless barley is unknown in the Canadian household, and is a cereal which should be employed in our diet. There are at least three varieties of hulless barley grown to a certain extent in Canada, and a fair quantity of this grain is produced in Alberta, where it is used particularly for feeding to young pigs. Hulless or naked barley, like the hulless oat, gives up its hull in the threshing machine and with very little difficulty can be prepared for grinding. It is not so easy to grind as the oat, but can be managed in almost any hand mill. To obtain fine meal the material may have to be put through the mill three times. Coarsely ground hulless barley makes excellent porridge. The skin is distinctly more conspicuous than that of oats, but it does not appear to be in the least degree irritating to the human system. The writer has repeatedly made his whole breakfast on barley porridge only (with sugar and cream), and has found it a very satisfactory form of nourishment. Such barley would make an interesting and valuable addition to the diet of most households and when once the demand for it was created, it should be obtainable at a very low price indeed. The writer has a large number of new varieties of hulless barley under test and hopes soon to be able to introduce one or two sorts which will be superior to any of those

now under cultivation. There should be a distinct future for hulless barley, both in the household and for feeding to farm animals. The commercially available varieties at the present time are Hulless White, Hulless Black, and a Himalayan barley which is usually called Guymalaye or by the extraordinarily corrupt name Guy Mayle. This latter variety is the best and the most commonly cultivated. The Hulless Black should be avoided on account of the danger of ergot being present. While barley is less subject to this disease than rye it is known in some parts of Canada and the ergot can only be detected with great difficulty when it occurs in a dark, hulless variety.

RYE.

As human food, rye is one of the least interesting grains and it is scarcely likely that it will ever be used to any considerable extent in Canada where other cereals are available. Rye bread is largely eaten in northern Europe, but a taste for it is difficult to cultivate, except when it contains a very considerable proportion of wheat flour. Even then it would not be eagerly sought after by most people unless they were accustomed to it from childhood.

INDIAN CORN.

While this grain is used very largely in human diet in the southern parts of the United States and elsewhere, it is not very much employed in Canada. The ground, purified meal, although it is somewhat different in composition from wheat, is too much like that staple cereal to present any very great advantages.

Sweet corn during the latter part of the summer furnishes a delightful vegetable which is extremely wholesome if taken in moderate quantities. It is, however, comparatively indigestible. The ripe grain, of either the sweet or the ordinary varieties can be ground and used in the same way as ground oats or barley, though the ripe sweet corn does not seem to possess quite so much nourishment as the plump and more starchy sorts.

Indian corn is rather a coarse food, distinctly more coarse than oats, and might not be desirable if used in large quantities, but it should certainly be tried in households where coarse food has hitherto received too little attention. In the warmer parts of Canada, almost any variety of Indian corn will ripen; and certain varieties, such as Quebec Yellow, will furnish a good yield of ripe grain in most seasons in districts farther north than Ottawa. The famous variety known under the name of Squaw has been grown for a very long time on the western plains and will usually ripen quite far north. Though Squaw corn gives a smaller yield of seed than most of the other varieties, its extreme earliness is important and its quality (for use when ripe) is first class. People who are not farmers and who have comparatively little land available for the growing of their own vegetable foods should not neglect Indian corn.

PEAS.

The consumption of a larger quantity of peas by the English speaking races in Canada would certainly be advantageous, as the pea is one of the most nourishing of all grains and is usually found to be very wholesome and palatable, though it may not agree with everybody, especially when taken in rather large quantities. The commonest use of peas is in soup, the seeds being either split first of all, or being added directly to the soup in whole condition. Peas which are of good cooking quality entirely disintegrate in about an hour in the boiling soup, and add greatly to its quality and food value. Whole peas can also be boiled and served in the same manner as beans

are often prepared. It is worth while to save for soup-making the water in which the peas have been boiled. For cooking purposes the irregularly shaped, greenish, garden peas, or the round, usually yellowish, field peas may be used. Neither type can be depended on always to cook easily. Some lots soften very quickly while others remain hard for a long time.

Pea meal is occasionally used for porridge but for cookies or tea biscuits it is not remarkably good.

BEANS.

The ripe bean like the ripe pea is much less used than it should be in most parts of Canada. On account of their susceptibility to frost, beans cannot be grown over quite as large an area as peas, yet there are early maturing varieties such as "Yellow Six Weeks" and "Norwegian Ottawa 710" which will ripen in most of the well-settled areas of our country. In districts here early frosts are not feared, the white varieties such as Navy and White Pea are probably the best to cultivate. For the home garden, the bean is particularly desirable as, by a suitable choice of varieties, it can be utilized both when green and when ripe. Beans can be used in any way in which peas are employed and furnish, like peas, food very high in protein. At the same time, it must be noted that beans cannot be eaten very freely by every one nor can they be regarded as a complete substitute for meat, though undoubtedly many people by adding beans to their regular diet could reduce the quantity of meat consumed.

Probably the best ways to use beans are either boiled and served like potatoes, with a meat course, or else baked as a supper dish. They are also excellent when added to soup. Bean meal cookies or tea biscuits are not very desirable.

Beans, especially those grown in tropical countries, sometimes contain, in the raw state, a poisonous substance, which, however, is decomposed and driven off by cooking. While there is no danger from the use of Canadian beans when well cooked, it is a good plan to reject any water in which raw beans have been soaked.

RECIPES.

The following paragraphs are intended to show some of the ways in which the various grains can be utilized for human food. Porridge is one of the best forms in which ground oats, barley, Indian corn and rye can be served. An interesting, varied and very economical breakfast diet can be provided in that way. Whole peas and beans are particularly appropriate as a dinner dish or in soup. Baked beans with pork (and molasses if desired) make a good supper dish. Almost any grain, finely ground, can be made into cookies or tea biscuits, though the addition of a certain proportion of wheat flour is almost essential.

GRAINS COOKED WHOLE.

Peas, beans and pot or pearl barley are very good when boiled whole and served with a meat course. Pearl barley is also excellent for puddings. Hulless barley is less satisfactory. Oats, rye, etc., can also be cooked whole, but they should usually be ground before cooking.

No special directions are needed for the ordinary boiling of these grains. The following is a good recipe for baked beans (a famous New England dish):—

Boil the beans, with some salt, fat pork, until they begin to crack; then put them into a covered baking pan or crock and place some of the pork in the mass. Most people prefer to add a little sugar or molasses at this stage. Bake at a moderate heat for two hours or more, taking care that the beans do not become too dry.

SOUP.

Any coarsely ground grain makes a useful article to add to soup. Peas and beans are perhaps best adapted to this purpose, especially because, when they are of good cooking quality, they do not even need to be ground but can be put whole into the soup. Boiling for an hour or two causes them to disintegrate. Of course, other grains can also be used whole in the same way, but they are generally more satisfactory if added in coarsely ground condition.

PORRIDGE.

For this purpose the grain should be ground to a rather coarse meal, unless a very smooth porridge is preferred. The meal should be cooked for from one to two hours. A good plan is to boil it for a while the evening before it is wanted, then place the pot in a fireless cooker and finish the boiling in the morning. Ground hullless oats make perhaps the best porridge but hullless barley, Indian corn and other grains are also very good for this purpose.

OAT CAKE.

This is a special kind of flat cake made entirely from ground oats and quite unlike anything prepared from any other kind of grain. As a rule, oat cake is made by adding salt, a little butter or other fat, and some water to the fine meal. The dough is rolled out very thin before being put into the baking pan.

COOKIES.

When using most kinds of meal, it will be found necessary or advantageous to add a certain quantity of ordinary flour to the dough for cookies. The following formula gives good results with almost any kind of fine meal:—

- 1½ cups of meal.
- ½ cup of white flour.
- ¼ " butter and lard or other fat.
- ¾ " sugar (brown, white or maple).
- 1 egg.

Add a little salt unless the butter contains a good deal. Mix the beaten egg with the sugar and fat. Mix the flour and meal. Lastly mix all ingredients together.

The dough is usually rather difficult to handle but can be rolled out and cut into shapes on a board well covered with fine meal or flour. Bake from 10 to 30 minutes, according to the heat of the oven.

Whole wheat cookies of good quality can be made from the following recipe, without the use of any flour at all:—

- 2 cups of fine wheat meal.
- ½ cup butter and lard mixed.
- ¾ cup sugar.
- 1 egg.

The dough should be stiff but it may perhaps require the addition of a very small amount of water in some cases.

TEA BISCUITS.

Good tea biscuits can be made from finely ground wheat, without the addition of any flour but when fine meal made from other grains is used it is desirable to employ about equal parts of this meal and of wheat flour. The following biscuit formula is very satisfactory:—

- 1 cup of fine meal.
- 1 cup of flour.
- 2 teaspoonsful of baking powder.
- $\frac{3}{4}$ cup of butter and lard mixed.

Mix together the meal, flour and baking powder and add a very little salt unless decidedly salty butter is being used. Then add the fat and mix thoroughly. Lastly add enough water to make a rather slack dough. Roll and cut on a floured board. Bake about 10 minutes in a very hot oven.

If pure wheat tea biscuits are desired, two cups of fine wheat meal can be used, without any flour. The resulting biscuits are somewhat coarse and not very light, but of good flavour and quite palatable.

BREAD.

Almost any kind of fine meal can be added to bread to the extent of about one-quarter of the weight of the flour, without much danger of making the bread too heavy. It is the opinion of the writer, however, that better satisfaction will usually be obtained by retaining on our tables the white bread of which most people are fond, and using other grains in the form of porridge or boiled whole or put into soups, cookies, or tea biscuits. A more pleasant, varied and wholesome diet will thus be obtained than by attempting to include coarse foods among the ingredients of bread.

MILLS FOR THE GRINDING OF VARIOUS GRAINS.

Most farmers who are well established have some kind of power mill which can be used for the grinding, either coarse or fine, of the different grains discussed in this publication. For ordinary householders or for farmers who have not any large machine, some form of hand mill is necessary. The writer does not know of any such mill made in Canada. The best one he is acquainted with is specially manufactured for household purposes by Wilson Brothers, 43 Delaware street, Easton, Pa., U.S.A. This mill is quite inexpensive.

Oats are very easy to grind. The other grains require more effort. For the production of coarse meal, such as would generally be preferred for porridge, one operation is usually sufficient; but for the finest meal such as is desirable if cookies or tea biscuits are to be made, it will probably be necessary to put the material through the mill three times.

