

UC-NRLF



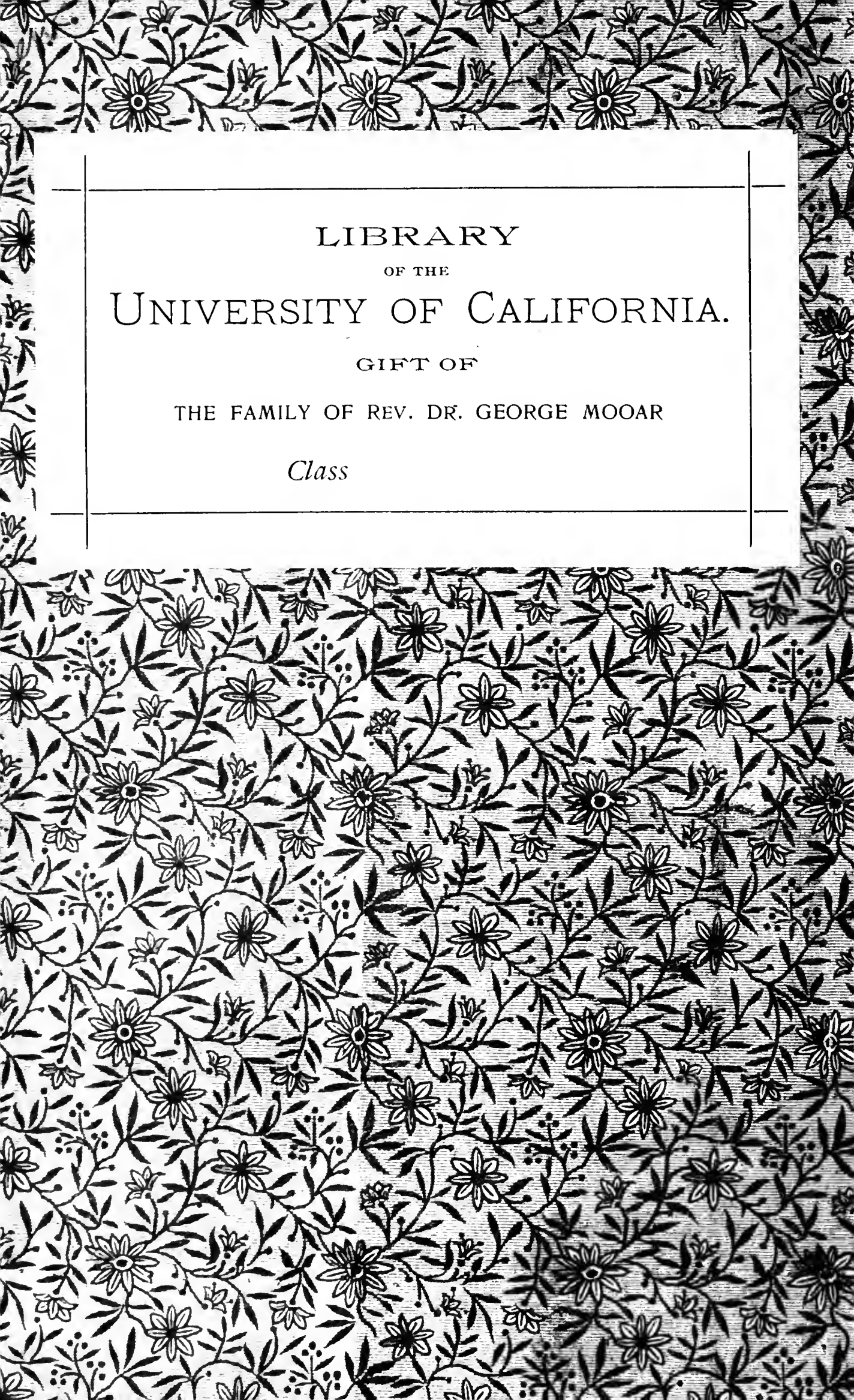
\$B 276 218

FOOD

AND

WORK

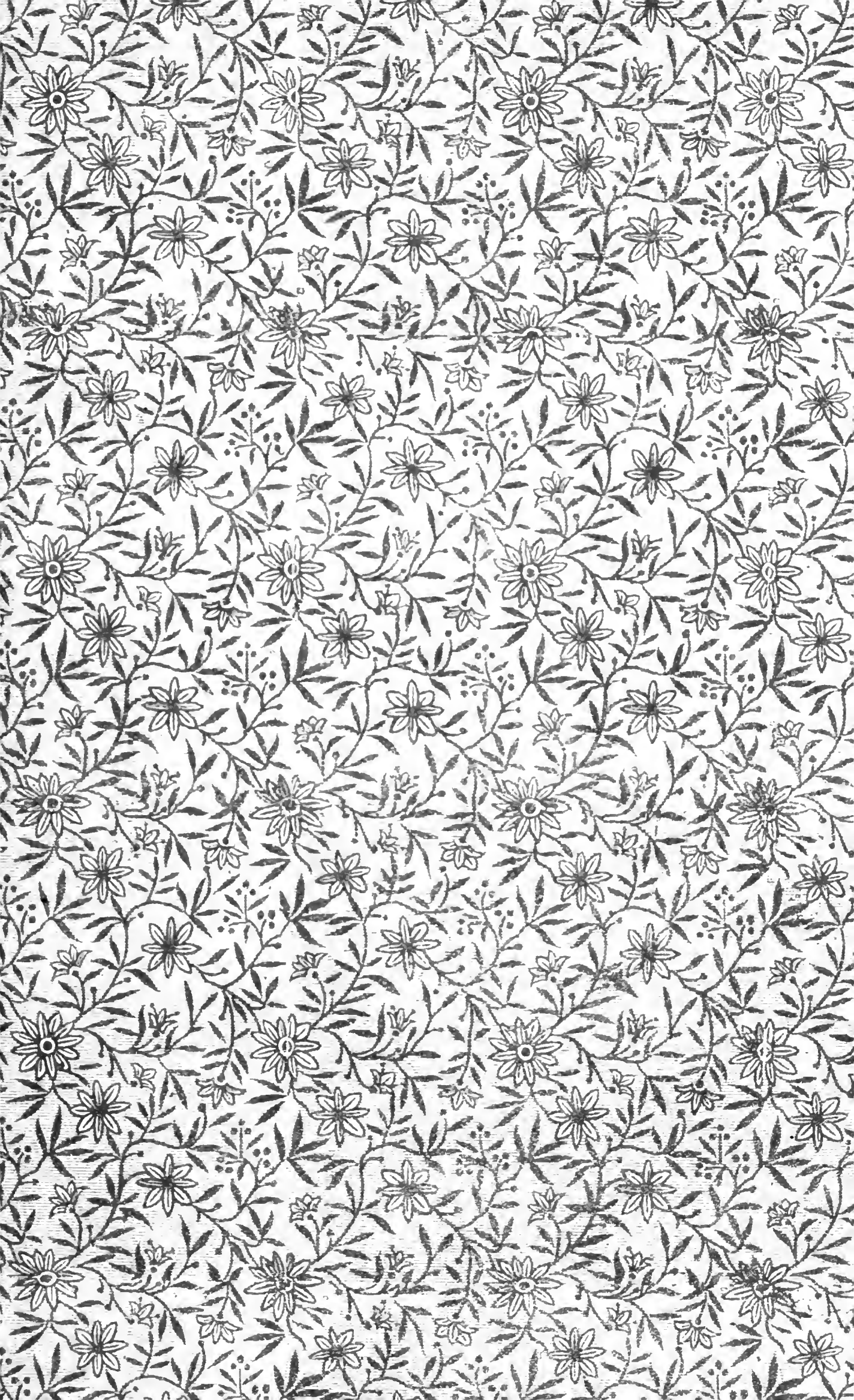
M. L. HOLBROOK



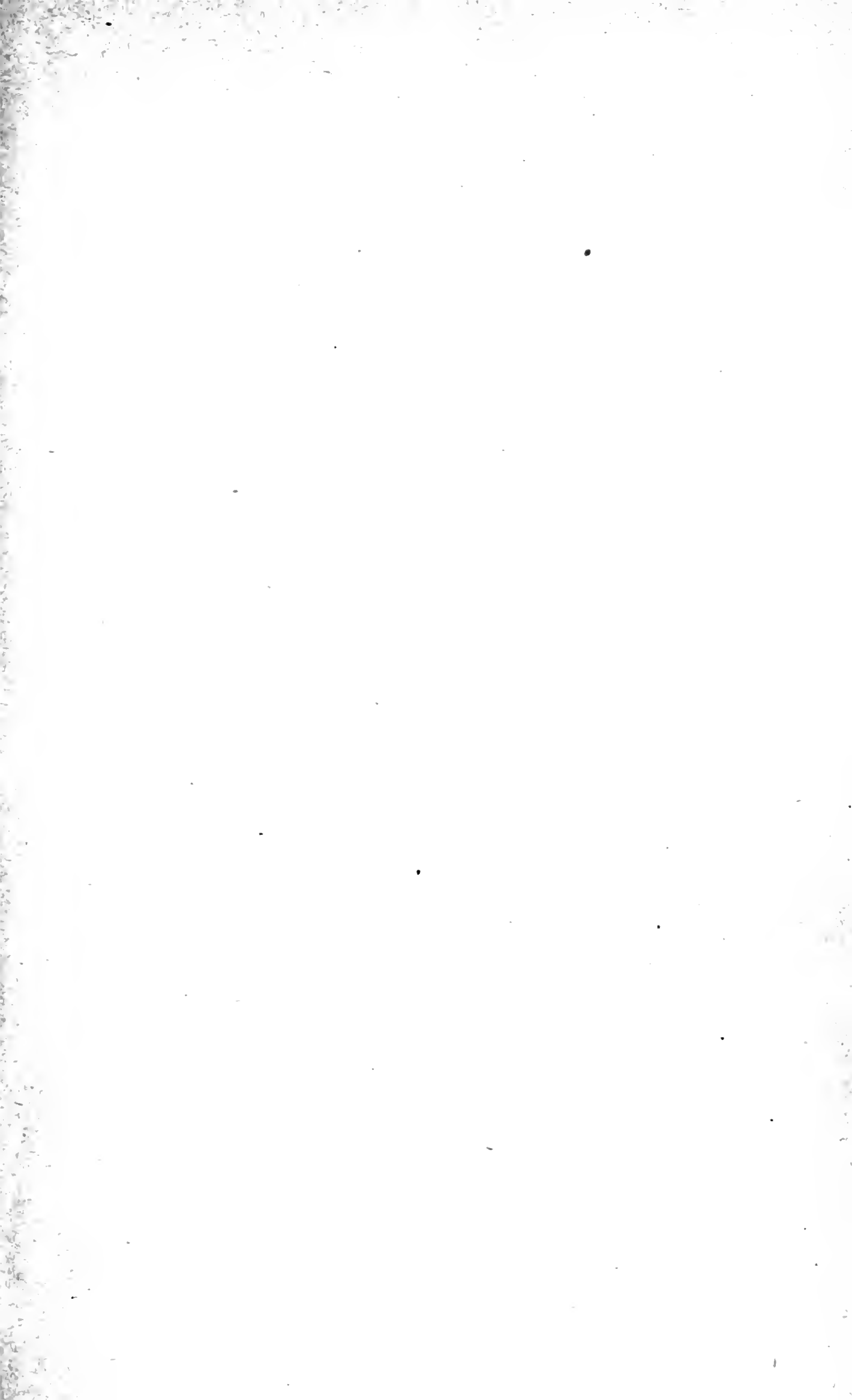
LIBRARY
OF THE
UNIVERSITY OF CALIFORNIA.

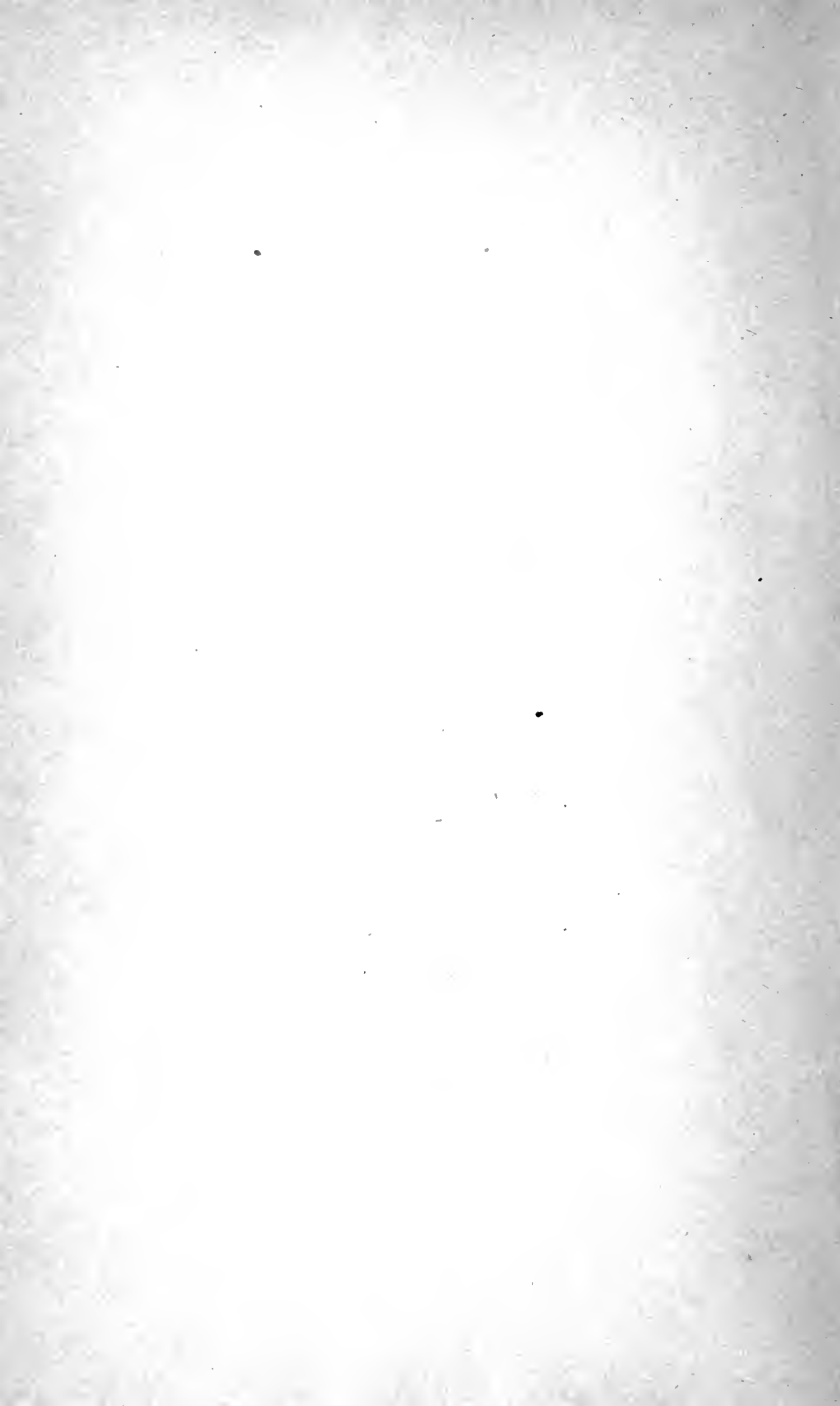
GIFT OF
THE FAMILY OF REV. DR. GEORGE MOOAR

Class



Digitized by the Internet Archive
in 2007 with funding from
Microsoft Corporation





EATING FOR STRENGTH;

OR,

**FOOD AND DIET IN THEIR RELATION TO
HEALTH AND WORK,**

TOGETHER WITH

*SEVERAL HUNDRED RECIPES FOR WHOLE-
SOME FOODS AND DRINKS.*

BY M. L. HOLBROOK, M. D.,

PROFESSOR OF HYGIENE IN THE NEW YORK MEDICAL COLLEGE AND HOS-
PITAL FOR WOMEN, EDITOR OF THE "HERALD OF HEALTH,"
AUTHOR OF "HYGIENE OF THE BRAIN," "HOW TO
STRENGTHEN THE MEMORY," "PARTURITION
WITHOUT PAIN," ETC., ETC.



NEW YORK:
M. L. HOLBROOK & CO.

X353

H6

COPYRIGHT BY
M. L. HOLBROOK,
1888.

P R E F A C E.

In no period of the world's history has there ever been so deep an interest in the subject of foods as at the present. At no time since Adam and Eve left the Garden of Eden has agriculture and horticulture been so perfect, and the human race supplied with so many choice and nourishing articles of diet. And, also, at no time have so many been engaged in laborious researches on the nature of that which we eat and its relations to health and work. It would almost seem as if the time had nearly arrived when mankind would eat to live, would feed themselves so as to nourish their bodies most perfectly and render themselves capable of the most labor, and least liable to disease.

The object of this volume is to present the most recent facts of science in a way to make them valuable for actual use in daily life. There is no doubt but man may double his capacity for work and for enjoyment by improving his dietetic habits. Many have already done this, and multitudes more are only waiting for the knowledge which will help them to do it. A thorough understanding of the different divisions of food and their right relation to the needs of the body is necessary, and this has been fully stated. Several new features have been introduced. To meet the requirements of that constantly increasing class who have more and more desire so far as is possible to draw their nourishment from the vegetable kingdom, carefully and elaborately prepared tables have been arranged showing just how much of each particular food one needs to consume in order to provide the body with the required amount of proteids, carbo-hydrates and fats.

PREFACE.

These tables have been especially prepared for this work and are full of interest as well as being of practical value. Another interesting feature of the work relates to the cost of the different articles usually consumed, as for instance the cost of proteids, fats and carbo-hydrates in oatmeal, beef, mutton, corn, eggs, butter, cheese, beer, etc., etc. These tables are so arranged as to show at once which are the most economical articles for the table and which the most expensive, and will be of great value to all who would choose their food wisely, and also for those who desire to reduce the cost of living to a minimum and yet nourish themselves perfectly.

The chapter on the use of the apple as a means of preserving health and the one on the grape cure will, the author believes, meet a need long felt, as will also what has been said concerning the importance of the thorough mastication of our food.

The subject of drinks has also been treated fully, and a very large number of recipes for wholesome ones given. What has been said on this subject cannot fail to prove helpful to those who are in doubt on many points.

The directions for feeding young and delicate children have in practice proved most satisfactory.

The time is near when a knowledge of the principles of diet will be considered as important a part of our education as a knowledge of the multiplication table. That this little work may help to hasten this time is the sincere desire of the author.

M. L. H.

CONTENTS.

CHAPTER I.

The Uses of Food:.....	9
A Happy Illustration	11

CHAPTER II.

Classification of Foods:	13
The Proteids	13
Fats.....	14
The Amyloids, or Carbo-Hydrates	20
Starch.....	20
Sugar	21
Mineral matter.....	22
Water	34
Amount of Water Required for Men and Women	34
Amount of Water Required for Animals.....	35
Amount Required for the Sick	35
Purity of Water	36
Distilled Water	36
Gaseous Food—The Atmosphere	37
Accessory Foods	39

CHAPTER III.

The Daily Requirements of the Body.....	43
What is a Day's Work.....	43
How much the Heart does.....	44
Constituents of a Sufficient Diet	45
Average Diet of Farm Laborers.....	48
Diet According to Work done	48
Composition of the Body	51

CHAPTER IV.

Digestion	53
Mouth Digestion—Mastication	55
Stomach Digestion	53
Conditions of Perfect Digestion.....	57
Chewing Food Thoroughly	58
The Eat Your Food Slow Society.....	58
Conditions that Favor Digestion	59

CHAPTER V.

The Sources of our Foods	61
A Practical Chapter from a Chemical Standpoint.....	66
Diet for Hard Work	67
“ “ Light Work.....	67
Normal Weight in Proportion to Height—a Table	68
Table Showing Amount of Proteids to the Ounce in Principle Foods...	69
Table Showing Carbo-Hydrates in each Ounce of Principle Foods	70
Table Showing Amount of Fats in each Ounce of Principle Foods	71

CHAPTER VI.

The Economy of Foods.....	75
Tables Showing the Relative Cost of Nutriment in Principle Foods.....	80
A Practical Lesson in Economy.....	88
How to Live Well at Small Expense	89

CHAPTER VII.

Simplicity in Living	93
Feeding Children	93
An Argument for Plain Living and High Thinking.....	94
How our Great Workers Live	94

CHAPTER VIII.

Food and Intemperance	98
Why People Want Stimulants.....	99
The Cook and Temperance.....	100

CHAPTER IX.

Alimentary Products of the Vegetable Kingdom.....	102
Wheat	102
A Beautiful Microscopic Object.....	104

CONTENTS.

vii

Oats	105
The Most Strengthening Food	103
The Cooking of Oatmeal	109
Oatmeal Gruel and Milk.....	111
Barley	112
Rye	112
Indian Corn	113
Rice.....	115
Best Method of Preparing Rice.....	116
Buckwheat	116
Peas, Beans and Lentils.....	117
Composition of Peas, Beans and Lentils—a Table.....	119
The Potato.....	120
The Sweet Potato.....	121
The Onion.....	122
Other Roots.....	122
The Cabbage.....	122
Spinach	123
Rhubarb.....	123
Celery.....	123
Asparagus.....	123
(Lettuce.....	124
· Cress.....	124

CHAPTER X.

Fruits:	125
The Apple, its Use and Healthfulness	127
Grapes.....	132
The Nutritive Value of Grapes.....	133
Their Physiological Effects	134
The Grape Cure.....	135
Methods of the Grape Cure.....	133
Choice of Grapes for the Grape Cure	142
Other Fruits.....	143
Nuts.....	144

RECIPES.

Soups.....	145
Porridges, including Mushes	148
Remarks, Rules and Recipes for Making Good Bread.....	149
To Cook Eggs.....	161
Preparations of Cheese	163
Sandwiches.....	163
Cooking Vegetables	164
Pies and Pie Pastry.....	170

Custards.....	175
Puddings	177
Cakes.....	180
Molded Farinacea.....	182
Miscellaneous Dishes.....	183
Liquid Foods.....	197
Simple Beverages from Fruits.....	199
Lemonades	200
Drinks from Various Substances	201
Ices	204
Milk.....	205
Tea.....	211
Cocoa	214
Chocolate	215
Methods of Preparing Tea, Coffee, Cocoa, etc.....	215



CHAPTER I.

THE USES OF FOOD.

Why do human beings eat? Why do all animals, from the simplest worm to the most civilized man, depend for life on food and drink? Why does a child become hungry, and if deprived of food beyond a certain time, become ravenous? Why does a hard-working man enjoy his food so well, and demand so much of it? Why do great men and powerful thinkers eat so abundantly? Why so many millions of acres of land devoted to agriculture and horticulture? Why so many more farmers producing food than people of any other occupation? It is because food is so necessary to life and health. What, then, is the use which it performs?

1. It furnishes material from which to construct the body. The child receives milk from its mother's breast, which increases its size, and a large body is the result. Farmers increase or diminish the weight of domestic animals, within a certain limit, by increasing or diminishing the food supplied to them. The development, within constitutional limits, to which a child may attain is, to some extent, dependent on the supply of food it receives and digests. Abundance of food, with plenty of air, exercise and sleep, insures a healthier growth than a scanty diet.

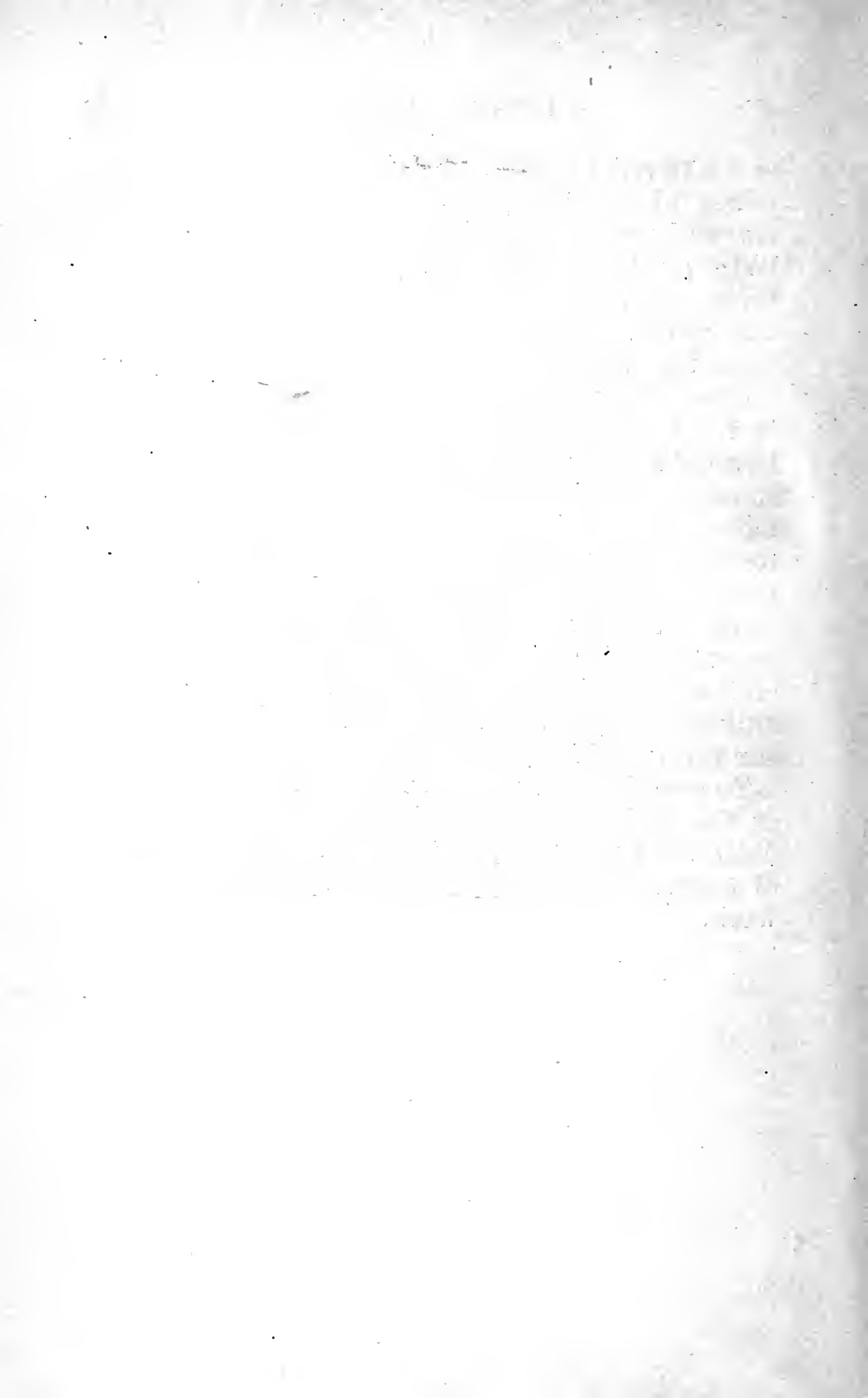
2. Another use of food is to replenish the waste that goes on in the body from its daily wear and tear. This waste varies with different persons, and with the amount of work done. Great workers wear out, use up daily several pounds of blood. New food is demanded to make good this loss. A month of sickness sometimes wastes away a third of the weight of the body; but a hearty appetite and food restore it to its full size. There are men of powerful frames who, if they do hard work, rapidly waste many pounds of their avoirdupois, and require much food to replace it. Small workers and lazy, idle people eat less; and there are many corseted and inactive young women, and idle young men, who waste little of the tissue of the body, and who eat little. It is not a bad sign to see healthy people eat heartily; they must do it to work and live.

3. Another use of food is to maintain the heat of the body. So important is this, that it has been computed that four-fifths of our nutriment is used to maintain a bodily temperature of $98\frac{1}{2}$ degrees. In order to understand the heat-producing power of food, let any one go in cold weather without eating for a day and still continue exposing himself to the cold, and he will learn that food will warm his body more effectually than clothing or fire.

4. Still another very important use of food is to furnish force. This comes in no other way. When plants grow they store up the energy of the sunshine, and when we consume these plants this energy is transferred to our bodies. It is manifested in many ways. First, in the form of motion; then in the form of sensation: feeling, seeing, hearing and thinking. Our ability to do any of these things

is conferred by food. The body has the peculiar power of abstracting its force from what we eat. Go without food, and all these functions of the body gradually die away, and life becomes extinct. To illustrate. Give a child a hickory bow and arrow. He bends the bow on its string, adjusts the arrow and pulls the string back a few inches. Now what has he done? He has stored up in the bow a part of the strength of his arm. But how did he get that strength? The sunshine of last summer stored it up in the bread and potatoes he had eaten. His body has the power to unfasten this force and apply it to bending the bow. When he lets go of the string the arrow flies away, and that force is, so far as he is concerned, spent. The food we eat does for us what the coal does for the engine on the railroad track, it furnishes the motive power; only the body is a complicated living machine and can think and feel, which the engine cannot do.

To recapitulate: we eat, then, to increase the size of the body; to supply the waste or loss by its daily wear and tear; to maintain a proper degree of warmth and to supply the energy by which to do work.





CHAPTER II.

CLASSIFICATION OF FOODS.

The classification of foods is quite simple. All the substances used come under one of the following divisions :

1. Proteids, or albuminous foods.
2. Fats, sometimes called hydro-carbons.
3. Amyloids, or carbo-hydrates.
4. Mineral matter.
5. Water.
6. Gaseous food, or air.
7. Accessory foods, or condiments.

THE PROTEIDS.

The proteids are also known as albuminoids and nitrogenous substances. Their principle use is to construct and repair the active tissues of the body and to furnish material out of which to form the various digestive fluids, as the saliva of the mouth, the gastric juice of the stomach, the bile of the liver, and juices of the pancreas. The nerves, the muscles and the glands are composed of living matter, of protoplasm, and cannot be built up, or the glands furnish their secretions without albuminous matter. Every structure in the body in which any form of force is manifested is mainly built up of

these proteids. Muscular tissue is a good example; the brain cells are also examples.

The proteids are complex bodies and contain carbon, 53 parts; oxygen, 21; hydrogen, 7; nitrogen, 15, and sulphur 1. The proteids of the body have only a slight affinity for oxygen, and, consequently, are not readily consumed. They grow old in time and decay, but do not burn up. What is known as the protoplasm, or living matter of our bodies, is composed of proteids, and we all know how living matter resists decay and change.

The principal sources of proteids are the muscular parts of animals, eggs of which the white or albumen is almost a pure proteid, the gluten of grains, the casein or curd of milk and the vegetable casein of peas, beans and cereals.

The proteids are digested in the stomach, this organ not digesting either starches or fats. Digestion makes them very soluble, and they are easily taken up through the walls of the digestive organs. In their soluble condition they are called peptones instead of proteids. If they were to remain soluble while in the blood there would be danger of their passing out through the kidneys, and so they are changed again to proteids in the blood.

THE FATS.

The fats are also called hydro-carbons. They contain some oxygen, but never enough to satisfy the affinities of the carbon and hydrogen. They are powerful generators of heat. An ounce of fat when burned produces about two and half times as much heat as dry starch or sugar. Some idea of its heating properties may be gained by the fact that ten

grains of fat burned will raise the temperature of twenty-three pounds of water one degree. This would give sufficient force to raise 18,000 pounds one foot high. Their uses are to maintain animal heat and to generate force. The man who does a hard day's work, does so by virtue of the fact that he is, so far as his labor is concerned, a living engine. The muscles do not furnish the strength, they only transmit it. The engine does not furnish the power; that comes from the steam so highly charged with heat from the burning fuel.

One of its uses is to prevent the loss of animal heat. A thick layer of fat is very useful in diminishing the chances of catching cold on exposure to drafts; and where the coating of fat under the skin is deficient or absent we must use an additional quantity of warmer clothing. A fat person suffers less from the cold, other things being equal, than a lean one, and does not require so much flannel to keep him warm. In very cold latitudes a layer of fat under the skin is a useful protection; but in hot climates it becomes oppressive, as we may see by observing corpulent persons or fat animals during the high heat of summer. In many animals, especially those of tropical climates where the summer heat is great, although the cold of winter may also be considerable, we find that fat, instead of being uniformly distributed over the body, is collected in masses in certain parts, as in the Brahmin bull of India, in the yak of Tartary, in the American buffalo, as well as in the camel of Africa, on whose back a huge lump of fat is found. On a careful examination of these lumps of fat, especially in

a well fed camel, we find them firm and solid, projecting upwards; but at times it appears that they lose this firm solidity and become limp, swinging from side to side and doubling up like a half empty bag. The cause of this is, we are told, that when their food is insufficient the hump becomes loose and flabby, a large proportion of fat having been absorbed. If the animal be kept without food for several days this protuberance almost entirely disappears. If the animal is well fed again the hump regains its former size. What has become of this fat? Some has undergone combustion to keep up heat, while the remainder may have been used to supply the waste of some organ of the body. The blood contains about one half of one per cent. of fat; the muscles from three to four per cent., and the brain eight or nine per cent. The nerves contain much more, sometimes as high as 22 per cent. Its use is to form a layer around the conducting part to isolate it. Fat may be supplied to the body in many ways, especially by fatty foods, starch and sugar. These are converted into fat within the organism.

The fatty parts of the body are not always of the same quality. Those accustomed to the fattening of animals know that sometimes the fat on them is soft and poor, and at others pure and hard, depending mainly upon the kind of food they have eaten. Nurses understand that some foods stick fast, while others are fickle and easily squandered. It seems that fats laid on rapidly are not so permanent as those more slowly acquired. One of the causes of consumption is the insufficiency of fat in the body. Either the stomach does not digest enough, or the food may be deficient in it. Dr. Hughes Bennett

used to tell his students that a frequent cause of consumption was the high price of butter and the great abundance of pastry cooks. The latter Dr. Bennett accused of causing consumption among the upper classes by disordering the digestion of young girls with pies, pastry and other things that spoil their appetites for the more substantial articles of food. Many people have a strong dislike to fatty foods, and even some physicians have advocated that this was a natural instinct; but the fact that there is in the body an arrangement for the digestion of fatty matter is a strong argument in favor of its use in a suitable amount. Dr. Brown says: "There are many children who refuse to eat a piece of fat meat. They will eat the lean, but cut off the fat, and submit to punishment rather than eat it. The instinct of the child is perfectly right, and its indications are not to be disregarded." Fat swallowed under compulsion generally disagrees with a child and makes it ill. The proper thing to do in such cases is to give it in some more agreeable form. Nuts contain a sufficient amount of oil; and sweet fruits, abundant in sugar, may to some extent supply its place.

If a lump of butter is swallowed by itself it will very likely make one sick, but spread upon bread it can be taken without discomfort. The reason of this is plain: we get the oily substance in a finer state of subdivision, so that it is more easily digested. A lump of fat swallowed alone would melt in the stomach and float about there without being digested, would begin to decompose and yield acrid bodies which would irritate the stomach and perhaps cause severe headache. When finely comminuted with

bread it forms a creamy mass, which passes quickly into the duodenum where it is digested. Many a child has been made sick by a piece of fat bacon swallowed with only a small piece of bread and a large piece of butter.

Fatty foods are most useful in bronchitis, consumption and nervous diseases. Hard brain work uses up a great amount of force, and this is largely supplied by the consumption of the fats, starch and sugar. A well known English lawyer always takes a meal of some easily digested fatty food before making a great intellectual effort, and an English physician has found that in his intellectual work he is best sustained by considerable of the same material.

We have seen that the nervous system contains much fat, and we may imagine that if the food is deficient in it the brain will suffer. Very thin people are more likely to be nervous than fat ones; and it is said that Bantingism practiced to cure corpulency has caused many persons to become very nervous. It does not follow because fat is necessary that people should eat all they can of it. It should be taken in reasonable quantities, and always thoroughly comminuted and mixed with other foods which will divide it up into very small particles, else it may cause indigestion and pass out of the system unabsorbed. Good butter, cream, olive oil and nuts are rich in fat, and in a form agreeable to take. Potatoes, corn, oatmeal and eggs, containing starch, are all fat producers. We once advised a boy who rejected every form of fat usually found on his mother's table, to eat freely of hickory nuts, and it proved to be very good

advice for him. That popular nut, the peanut, which even many physicians condemn as indigestible, has been of like service to others.

The chemical formula for fat is, carbon 10, hydrogen 18, oxygen 1. Its original source is the vegetable kingdom, in which it abounds. Palm oil, olive oil, cottonseed oil, flax-seed oil, cocoanut oil, peanut oil, etc., are examples.

Fat is a very concentrated fuel food, and is not in any way digested in either the mouth or stomach, but in the duodenum, where it is emulsionized, or broken up into very minute globules capable of being passed through the absorbent vessels.

Fat often disturbs delicate stomachs, and persons with such should choose the most agreeable kind.

Fat frequently become rancid, and in this state is very injurious to the civilized stomach, causing dyspepsia, sick headache, heartburn, etc.

Besides these important and principal functions of fat, it has minor uses in the processes of digestion, assimilation and nutrition, and, it is believed, in the formation of bile. Food digests more readily if a certain amount of fat is mixed with it. It also plays an important part in the formation of cells, blood corpuscles, and even the generation of blood. It is present in large quantities in the tubules of the nerves, insulating them so that the nervous force is not dissipated, but travels along the nerve to its center; and in all the nervous centers serving an important function there.

The distribution of it in every tissue, and its accumulation around certain organs, serves to fill up the cavities of the body and give roundness to the form, equalizing the external pressure diminishing

friction; and, by its bad conducting property, retaining animal heat. Fat, therefore, must ever be regarded as highly important to the physical development of the body, and any system of diet that excludes it is faulty and to be condemned.

THE AMYLOIDS OR CARBO-HYDRATES.

This class of foods is best represented by starch and sugar. They are called amyloids because this word, from the Greek, means resembling starch. They are also called carbo-hydrates because chemically composed of carbon and water. The chemical formula for starch is carbon, 6; hydrogen, 10; oxygen, 5. That of sugar is slightly different; cane sugar being, carbon, 12; hydrogen, 11; oxygen, 11, and grape sugar being, carbon, 12; hydrogen, 12, and oxygen, 12.

STARCH.

Starch and sugar have their origin in the vegetable kingdom. Starch abounds in all the grains, in rice, in peas and beans, and in the common and sweet potato. It is also present in many other substances. Starch is insoluble in water, and this is a wise provision of nature; otherwise it would be easily dissolved by the rains and washed out of plants. In its insoluble state it is useless as a food, but during the process of digestion it is converted first into soluble dextrine, which has the same chemical formula as grape sugar, and a little later into grape sugar itself. The change takes place partly in the mouth by the action of the saliva during the process of mastication, but owing to the

acidity of the gastric juice of the stomach the digestion of starch ceases soon after it reaches this organ. After the food has been passed into the duodenum, where the secretions are alkaline, the digestion of its starch proceeds very rapidly until it has been completely converted into grape sugar, in which state it is soluble and easily absorbed. If the food has not been properly masticated and mixed with saliva in the mouth it is liable to embarrass the stomach and cause indigestion; indeed this is one of the most fruitful sources of dyspepsia. On the other hand, if the food has been thoroughly masticated and allowed to remain in the mouth until it has been converted into a milk-like condition, even raw and uncooked starch is so thoroughly changed, as not to disturb the digestion of the albuminoids as it goes on in the stomach.

It is well known that many persons are not able to digest the starch of bread. By toasting it, however, the heat changes it into dextrine, in the same manner as the saliva does. A little more chewing would accomplish the same result.

SUGAR.

Sugar, although very different in its character and nature from starch, is a carbo-hydrate. Sugar may be divided into crystalline or cane and into glucose or grape sugar. It is the food of young plants and is found in all young shoots. It is soluble and does not need to be digested; but it is believed that cane sugar is converted into grape sugar in the alimentary canal. Experiments made by Sir William Roberts, M. D., go to show that considerable sugar

in food taken into a healthy stomach does not retard digestion.

The carbo-hydrates form a most important part of our food and are contained in nearly everything we eat. They are fuel foods and supply animal heat. They are also, like fats, an important source of the force or strength of the body.

HEATING POWER OF TEN GRAINS OF THE VARIOUS SUBSTANCES IN THEIR NATURAL STATE.

	Lbs. of water raised 18 F.
Grape sugar	8.42
Lump sugar	8.61
Starch from Arrow-root	10.06
Butter	18.60
Beef fat	20.91

From this it will be seen that fat is more than twice as valuable a heat-producing agent as starch.

There is also the same difference in the amount of work these substances will accomplish when burned, as the following table will show :

MOTIVE POWER OF TEN GRAINS OF THE SUBSTANCE IN ITS NATURAL STATE.

	Lbs. lifted one foot high.
Grape sugar	6,500
Lump sugar	6,647
Arrow-root	7,766
Butter	14,441
Beef fat	16,142

MINERAL MATTER.

We read in the Bible that God created man out of the dust of the earth. Whether this is to be interpreted literally or figuratively I leave to theolo-

gians to decide. For the scientist it has plainly a symbolical significance. The materials of which our bodies are composed are partly earthy, and it is not possible to think of them as composed without earthy substances. We call these constituents salts, and if they were not present in our food life could hardly be continued as at present.

There is a very simple method by which any one can obtain the salts of any organism. We have but to burn that body and most of them remain as ashes. Whatever belongs to the organic world flies off in vapor and smoke. The same result is reached by the slow process of decomposition. The salts remain while the organic part of the organism escapes into the atmosphere.

Only a limited number of minerals take part in the formation of our bodies. Each organ has a composition of its own. The same parts in different men and animals are of nearly the same composition, but one organ differs from another in a slight degree. The bones, the hearts, the stomachs of all animals are nearly the same, but the composition of the heart and stomach in the same person differs.

These facts prove the great importance of the mineral matter of our food. Had each organ the same composition a less variety of mineral matter would suffice; but as each demands a special salt for itself there must be considerable variety. In one organ is needed the salts of potash; in another, those of soda or phosphorus. Another reason for variety is the fact that the processes of osmose and endosmose, or the exchange of fluids inside and outside the cells, depend largely on the fact that the constituents of the fluids on one side of

the walls of these structures differ from those on the other side. Without this difference no change, or scarcely any, would take place, and the growth and nutrition of each part would come to a standstill for want of new and appropriate material.

Professor Forster, of Munchen, has made a large number of experiments to discover the importance of mineral matter in our food. Two pigeons were taken for one experiment and fed on food containing every other requisite: albumen, carbo-hydrates, etc., but entirely freed from all mineral matter. These pigeons took their food regularly, but soon lost all their liveliness and sat dumb and motionless on the bars of their cages. After the tenth day they ate but little and lost in flesh. On the twenty-fourth day one of them had a fit, and both refused to eat. He then fed them by compulsion. One died on the twenty-sixth day by a return of the fit, and the other lived on to the thirty-first day, when it also had a fit from which it did not recover. An examination of the bodies of the pigeons revealed no traces of any disturbance of digestion.

He then took a dog and fed him in the same manner. He soon showed signs of weariness, lay sad and dull in his corner, had sudden fits as of madness, became weak and uncertain in his motions, trembled and showed signs of nervousness, became weaker and weaker till he could scarcely crawl, and still there was no disturbance in the digestion of his food.

Another pigeon was taken and fed on food free from mineral matter by compulsion. It died in thirteen days, and yet an examination of its body showed that it had been well nourished and the

organs were sound. The food had apparently been well digested. The absence of mineral matter had not prevented digestion until after several days, but had caused death. The animals had all shown muscular weakness and trembling, and in one case a sort of paralysis, as if the spinal cord and brain had been affected. The nervous system suffered most; indeed, it was apparent that the nervous weakness was caused by the absence of mineral salts, and we must from this look on them as necessary to excite and enliven the brain and nerves, and especially promote nutrition and secretion. We know that living a long time on pickled meat, salt pork or corned beef causes a sort of scurvy which is only cured by the use of fresh vegetables and fruit. Now, the brine used to preserve the flesh has the power to draw from the meat its mineral constituents which the fresh vegetables replace.

Dr. Forster's investigations gave one other result. He found that the animals fed by compulsion on food freed from its mineral matter died sooner than those not fed at all. The explanation he gives for this is, that if no food is given the body is nourished on itself, and, consequently, a supply of mineral matter is obtained from the decomposed flesh of the body; but when nourished on food free from salts there is no demand from the body for albumen and carbo-hydrates, and so no mineral matter is received from its decomposition. The salts of our food are more necessary to the growing organism than for the adult. They may be divided into two kinds—the fixed and the non-fixed. The former includes those firmly united to the tissues of

the bones ; the latter those dissolved and circulating in the blood.

The excess of salts does not make tissues richer in them, because this excess is excreted almost immediately, except, perhaps, in the case of persons advanced in years, whose powers of excretion are weakened and whose lime salts may accumulate in excess and cause harm.

Let us now turn our attention to the salts which are found in our tissues. We find the following always present: potash, soda, lime, magnesia and iron. In part these minerals are in union with chlorine and in part with carbonic acid, but mostly with phosphorus acid. In the bones the lime salts are more abundant and important. For the other organs the potash and soda salts are necessary. Especially important are the potash salts for the muscular tissues ; for the serum of the blood the soda salts are most important. In the blood corpuscles potash salts and iron are predominant. Scarcely a trace of potash is found in the serum of the blood. These substances are all derived from our food and drink ; the only one added artificially is chloride of soda, or common salt. This, too, is found in the food, but, apparently, in quantities too small for the requirements of the system.

The bones are built mainly of phosphate of lime, phosphate of magnesia and carbonate of lime ; the former constituting the principal part of their earthy constituents. The phosphoric acid and potash constitute an essential mineral element of the juices of the flesh and are dissolved in them. One may notice on cooked beef a white incrustation

over its surface when it comes to the table. This is the phosphate of magnesia, formed by a union of the phosphoric acid in the flesh with the lime and magnesia in the water in which the meat has been boiled.

Phosphoric acid is the most abundant of all the minerals of the body, and it is also most abundant in the food of the vegetable-eating animals.

Experiments have been made to discover if one salt might be substituted for another in the body, but without success. Three growing lambs were taken for this experiment. One was fed on food deficient in phosphoric acid, another on food deficient in lime, and a third was fed normally. The first two became emaciated and at the end of twenty-four days were near their end, when all three were slaughtered. There was no great difference in the composition of the bones of any of them, only this: those of the poorly fed animals were less rich in fat and less perfectly developed.

In some parts of Germany no water is given to children until it has been boiled to kill the germs of any disease present. This practice has certain advantages and certain disadvantages for the poor, where food is not abundant. The boiling water deposits on the kettle its lime, and this is a loss of so much mineral matter. It kills the germs, which is beneficial. If the child is suitably fed no harm is done, but a positive benefit; but if not well fed it is a loss to the bones to lose the lime in the water. Pure, fresh water from springs does not contain germs, and if it is used there is no advantage in boiling it. This objection would not have any force in our country where food is so abundant.

Let us now look at the potash and soda salts. Potash is a very remarkable material; phosphate of potash is an essential constituent of the muscles and also of the blood corpuscles. In the serum of the blood, however, it is an abnormal constituent, causing paralysis of the heart, and frequently sudden death. One may, without especial danger, take chlorate or carbonate of potash through the stomach, as is often the case by prescriptions of physicians. The same dose, or even a less one, however, introduced directly into the circulation causes death. A dog has been killed instantly by the injection of only one decigramme of the chlorate of potash into an artery.

Bunge experimented on dogs with flesh extract and found that, according to the size of the animal, a dose of from 15 to 25 grammes was deadly. Now, 25 grammes of flesh extract contain 2.5 grammes of phosphate of potash, and 2.3 grammes of this substance given to a dog caused death, accompanied by the same symptoms as with 25 grammes of flesh extract. Johannus Ranke says that potash is a substance which, if it accumulates in the flesh cells or nerve cells, causes irritation of the muscles and paralysis of the nerves.

We find here a riddle. How is it that this material is a necessary constituent of the firm material of our bodies, but so deadly in the serum of our blood? Dr. Bunge suggests that the potash and soda-salts neutralize each other, as is the case when mixed in the laboratory, and allowed to crystalize, new unions being formed, one being chlorate of potash and the other carbonate of soda.

Another fact comes to light in this investigation,

that the plant-eating animals require more common salt than the flesh-eating ones. Some of them are so greedy for salt that they visit salt licks to obtain it, which is never the case with carnivorous animals. Now, if we compare the food of the flesh-eaters with that of the herbivora we find about the same amount of chloride of soda (common salt), but the amount of potash salts in the food of vegetable-eating animals is from two to four times as great. Bunge suggests that the reason why the vegetable-eaters require more salt is to neutralize the great excess of potash salts, which we have seen may be very injurious; or may not the potash draw so heavily on the chloride of soda in the body as to make the addition of it in our food necessary in order to maintain the equilibrium of the body? In order to test this question scientifically, Bunge made an experiment on himself. First, he ate food for five days with such exactness as to bring the excretion of the salts to a regular and constant amount. On the fifth day he added to his food eighteen grammes of phosphate of potash. Although he had not added any chloride of soda there was not only an immediate increase of excretion of potash salts, but of soda salts also. Repeated experiments gave the same results. He estimated that by the addition of twelve grammes of potash salts to the food, nearly half of the soda salts of the blood would be extracted. This, he thinks, proved his hypothesis. Potash in small quantities withdraws from the body chlorine and soda, both constituents of common salts, and this requires the addition of it to our food.

We will now compare a few principal articles of

food and see the relative amount of potash and soda salts therein; and see, also, how deficient some of them are in soda, and how excessive is the potash in others.

	Potash Salts.	Soda Salts.
Rice	1.04 grammes.	0.028 grammes.
Apples	10.6 “	0.070 “
Beans	12. “	0.16-0.18 “
Strawberries	22. “	0.20 “
Wheat	4.7-5.8 “	0.14-0.32 “
Peas	6.-68 “	0.19-0.30 “
Rye	5.7-6.1 “	0.07-0.45 “
Potatoes	20.28 “	0.32-0.58 “
Mother's Milk	5.3-6 “	0.91-2.2 “
Cow's Milk	9.1-17 “	1.1-10 “

From this it may be seen at a glance that all vegetables contain less soda than milk; and they all contain, rice excepted, more potash than this article. If potash, as shown by Bunge, withdraws soda from the body, it may be seen that the addition of common salt to the food poor in soda is a scientific necessity.

We also see why a babe nourished on its mother's milk does not require the addition of common salt. Its food contains less potash salts and more soda salts than almost any other article of food.

Liebig remarked that there seemed to be a popular instinct to add more salt to those articles of food which were rich in starch, as, for instance, wheat meal, peas and beans, and it seems that these are the very ones which contain most potash.

Let us now look at this subject from another standpoint, and assume that only 100 grammes of albumen is necessary daily for the maintenance of the body, and if we estimate the amount of potash

in the different kinds of food necessary to furnish them would contain, we have the following :

Rice	1.24	grammes.
Wheat and Rye	2.-4.5	“
Peas and Beans	4.5	“
Barley	4.9-5.39	“
Cow's Milk	4.4-4.7	“
Woman's Milk	4.8-5.3	“
Potatoes	42.	“

We see that rice is very deficient in potash and soda. One who nourished himself on it would never suffer from an excess of potash salts, for it would not withdraw from the body soda and chlorine. And it may be remembered that rice food can be eaten and enjoyed without salt. Junghuhm states that whole nations of rice-eating people take this food without salt, and only with the addition of pepper. It is true that Europeans and Americans do not relish rice without this condiment. It is not a physiological necessity, however, but a habit which induces its use.

On the other hand, how would it be with a person living on potatoes? He would take daily forty-two grammes of potash, or over thirty times more than he who lived on rice. We said previously that twelve grammes of potash were sufficient to withdraw half the soda from the blood. How, then, with 42 grammes? And in practice we know that large quantities of salt is a physiological necessity for those who live mainly on potatoes.

In this connection it may be remarked that potash salts in large quantities affect unfavorably the mucus membrane of the digestive tract, and especially the stomach. Consequently, all those who

suffer from weakness of the stomach should avoid potatoes and substitute rice instead. Rice is also more easily digested than potatoes for other reasons. It contains less cellular, or woody and indigestible matter, enclosing the starch cells.

One writer on food (Mulder) goes so far in his opposition to potatoes as an article of diet, as to declare it would be a blessing to the race to banish them from the planet and substitute rice instead.

Dr. Bunge has collected facts concerning the use of salt among various people. He finds that those who live mainly on flesh, as hunters, fishermen and nomadic tribes, do not care for salt. Of the Samoyden he says: "They know nothing of bread and but little of roots. Flesh and fish constitute their daily food. The use of salt is unknown though easily attainable from the sea. The Tungusen eat no raw flesh, but cook it in fresh water and use no salt on it. The Dolganen and Juralkan, in North Siberia, possess many salt mines, but they never use salt, unless as a medicine. Their food is fish and reindeer flesh."

Wrangle writes concerning the Tschuktschen: "Their food is flesh, and they use no salt, but have actual repugnance to it."

Prof. Schwartz lived in the land of the Tungusen three years; lived on the flesh of wild birds and reindeer without the addition of salt, and felt no need for it.

There are tribes of flesh-eating men in both tropical Indies and Africa who use no salt; they even laugh at those who do use it.

On the other hand, most of the native tribes of Africa cultivate the soil. Mungo Park says: "The

Mandigos breakfast early on a porridge made of meal and water, flavored with the rind of tamarind to give it relish. About two they eat a meal consisting of pudding made of corn meal, milk and vegetable butter. Their chief meal is eaten late at night, and consists of broth made with corn meal, wheat meal with vegetables, with sometimes a little flesh and vegetable butter. They are principally vegetarians." Concerning salt, he says: "They have a great craving for it. If a child gets a piece of rock salt from a European it eats it as our children do sugar. The poor classes look upon a man who can afford salt as a rich man." Park's own experience was that he had a painful craving for salt which could not be described. On the west coast of Africa a man would sell his wife or child for salt. A war for a salt spring between different tribes is not uncommon. To them salt is no luxury, but a necessity. On the other hand, it cannot be denied that many persons who have adopted a wise, nutritious vegetable diet, consisting largely of nuts, fruit and grains, either partially or with, perhaps, eggs and milk, abstain from salt, as they believe, to advantage, and it is pretty certain that a majority of people consume far too much of it, more as a condiment than to meet physiological needs. Something yet has to be learned on this important subject.

Many of the facts and statements of this chapter are drawn from German sources, and especially from a little work entitled, "Die Modernen Principien der Ernährung," nach v. Pettenkofer and Voit, von Dr. Aug. Guckerson, a most valuable little work, putting in popular language the scien-

tific experiments of the most learned German students of man's food—a subject now attracting more attention than at any former time.

WATER.

Water is a liquid food. It constitutes a part of every tissue, in a free, loose state, and a part of it in a very intimate union with the tissues, so that it cannot be driven off by evaporation. When water is taken into the system, it assists in building up the organs and repairing them when worn out.

Water is the natural beverage of man. About eighty-seven per cent. of our bodies is water. It wastes with every breath and motion, and this waste must be restored with a fresh supply.

It softens and holds in solution the solid part of our foods so, that it will flow in the veins and arteries.

It maintains a proper bulk to both blood and tissues, rendering them mobile and soft instead of dry and hard.

It holds in solution the waste matter of the body, and transports it out of the system.

It takes up the waste heat of the body, and carries it away.

It slacks our thirst, and cools the blood in warm weather.

It may be the vehicle, taken hot, of carrying heat into the circulation after exposure to cold and damp.

AMOUNT OF WATER REQUIRED FOR MEN AND WOMEN.

An adult requires daily from three to six pints of water for nutrition. Not far from one-third of this

is contained in our food, and if much fruit is used, the amount required for drink is less. Women drink less than men, and children more in proportion to their bulk. During hot weather and when the exercise is very severe an additional supply is required.

AMOUNT OF WATER REQUIRED FOR ANIMALS.

Some experiments were made in English cavalry stables, in 1866, to determine the amount of water required, daily, for horses. It seemed from the report, that these animals vary in the quantity consumed as much as man; this variation depending upon the food, the weather, and the amount of exercise taken. If a horse is allowed free access to water at all times, he will drink on an average from six to ten gallons daily.

Dr. Parks found a horse, sixteen hands high, whose work was to draw a carriage eight miles each day, fed on hay and corn, that drank seven and a half gallons per day. Some stabled cavalry horses, used only enough for exercise, drank six and a half gallons daily, during the autumn months. In hot and dusty weather they required more. A cow or an ox, kept on dry food, will drink six or eight gallons daily; and a sheep or pig from one half a gallon to a gallon.

In the Abyssinian Expedition, the daily expenditure for water for animals on ship-board was as follows: Elephants, 25 gallons; camels, 10; large oxen, 6; small oxen, 5; mules and ponies, 5.

AMOUNT REQUIRED FOR THE SICK.

The sick require more water than the well, because so much is needed for washing and bathing;

but no very accurate experiments have been made regarding the amount required for drinking purposes. It would probably be less than for active healthy persons.

PURITY OF WATER.

Perfectly pure water does not exist in nature. The nearest approach to it is distilled water. The best natural waters contain some salts of lime, magnesia, atmospheric air, carbonic acid, and other substances, and many contain in solution, organic and inorganic matter enough to render their use objectionable. Water that contains much lime and magnesia is called hard water, and conveys to the blood substances which interfere with the most perfect action of the organs of the body. Water containing organic matter dissolved from vegetable and animal substances, or poisonous gases dissolved from the air, is a very dangerous drink, to be avoided under all circumstances. Water contaminated with malarial germs is a source of malarial fever, and it is a question if this disease is not caused by drinking water quite as often as by breathing the air of malarious districts. Water contaminated by matter from cesspools, privies and barn-yards, is a common source of typhoid fever. There is no doubt but the unclean water about many farms and dairies spreads disease in healthy towns, and causes much loss of life.

DISTILLED WATER.

In diseases, distilled water may be an important aid to recovery. It can be made by the use of apparatus, which need not be troublesome or inconvenient.

Druggists generally keep it for preparing medicines. Comparatively pure water may be made by boiling, cooling and straining it through a pan of charcoal, and keeping in a well-corked bottle in a cool, dark place.

GASEOUS FOOD.

THE ATMOSPHERE.

The atmosphere is the only gaseous food required by man ; and the necessity for its oxygen is absolute and continuous. The nitrogen of the atmosphere, so far as is known, plays only the part of a diluent, and does not enter into any important chemical combination within the body.

When the mixed gases of the air are drawn into the lungs, a portion of the oxygen is absorbed by the blood, and, during the course of the circulation, unites chemically with the carbon, nitrogen, and hydrogen of our food—forming chemical compounds, generally called carbonates, nitrates and hydrates. Some of these compounds go to form a part of the substance of the body; but the greater proportion of them, after producing heat, leave it as carbonic acid and water.

From the stand point of a chemist, the living body is a great oxidizing machine, constantly burning up its own substance. If the process of this combustion could be seen it would perhaps resemble the glow seen on the firefly in its nocturnal flight, but this we can only conjecture. It is a very safe statement to make that, so far as we know, every act of man, and each unconscious change within his body is accompanied by a consumption of oxy-

gen. The quantity of air consumed, when compared with the amount of other food, is very considerable—the average for adults being 360 cubic feet every day—about 2,000 gallons; which would weigh not far from twenty-five pounds.

Though fresh air is abundant in nature and costs nothing, yet it cannot be doubted that a large number of persons, especially sedentary ones and those who spend a large portion of their time in-doors, have their health injured, their working capacity diminished, and their length of days shortened by an insufficiency of air. They literally starve for this form of food.

The amount of fresh air required hourly in temperate climates, from which to draw the amount required for actual consumption, has been variously estimated by hygienists. General Morin, of Paris, published some results of his own experiments and observations on this subject which are worth repeating. Work-shops, prisons and theaters require 2,118 cubic feet hourly for each person; schools, 1,059 cubic feet; hospitals at ordinary times, 2,825 cubic feet; during operations, 4,236, and during epidemics 5,650 cubic feet. I am of the opinion that Morin's estimates are too low, and that not less than 7,000 cubic feet should be provided hourly for each person. This will keep the carbonic acid and other impurities which emanate from the body down to nearly the same amount as in out-of-door air.

It has been found that in mines, if it is wished to keep up the energies of the workmen to their full capacity, not less than 100 cubic feet per minute for each man is necessary, and if the quantity be reduced one third or one half there is a correspond-

ing falling off of the work done by the men. Robert Stephenson is of the opinion that 100 cubic feet is not sufficient. The best physicians now agree that in fevers and contagious diseases the more complete exposure of the patients to the atmosphere the better, and that fresh air is of more importance than medicine. I asked a young physician connected with one of the hospitals, the other day, what was the latest method of treating pneumonia. He replied, "Exposure to cool fresh air;" and then he added, "We recently had thirty-four cases in one hospital, and lost but one." I asked if there was no danger in cold weather of injury from cold, and he said that under proper precautions there was not the least danger.

I can not go into any detailed account of the question of air and its purity, or of ventilation, here. The subject is treated elaborately in works on Hygiene; but I may add, that the condition of the atmosphere varies with every hour of the day, with every change of temperature and pressure, with every change of wind and season, with every degree of latitude and longitude, and with all those multitudinous conditions constantly taking place on our globe; and I may also add that, notwithstanding the fact that Nature has supplied us with it in the greatest abundance, we need after all, to pay constant attention to its purity, to ventilation, and all those matters which will help us to receive it in abundance and purity.

ACCESSORY FOODS.

Accessory foods do not contain any appreciable amount of nourishment, but act as condiments,

stimulating the digestive organs, promoting the flow of saliva, gastric juice and other internal secretions, and increasing the peristaltic movement of the viscera. They are used to improve the taste of whatever is eaten, so as to make it more enjoyable, or to stimulate the nervous system to an increased activity.

A few of the accessory foods may be mentioned: Tea and coffee; every form of alcoholic beverage, as wine and beer; spices of all sorts used in the culinary art, and vinegar, mustard, horseradish, pickles, etc., etc. Salt has generally been regarded as a condiment also; but recent investigations go to show that while it possesses some of the properties of this class of foods it is, in fact, to a certain extent, a food itself; or, at least, its presence is a necessity in the blood.

There is a marked difference of opinion on the value and usefulness of accessory foods between various authorities. Pettenkoffer says: "Accessory foods (Genusmittel) are true friends of man. They help the organism over many difficulties. I might compare them to the oil used to lubricate machinery which, while it cannot be substituted for the steam power, causes every movement to go easier, without friction, and more smoothly than it otherwise would."

But, on the other hand, many of our condiments may very justly be classed as drugs or medicines, and their habitual use by healthy persons, it requires but little intelligence to know, must be injurious. Their influence is mainly on the nervous system. Now, in a state of health, and especially with the young, the nervous system does not re-

quire a spur constantly applied to make it do its work. When age advances, if the constitution has been injured, perhaps this rule might be relaxed. W. Mattieu Williams, in his admirable work upon the Chemistry of Cookery takes the same view that I do, and says: "Cayenne pepper may be selected as a typical example of a condiment. Mustard is a food and a condiment combined. This is the case with some others. Curry powders are a mixture of very potent condiments with more or less of farinaceous materials and sulphur compounds, which, like the oil of mustard, onions, garlic, etc., may have a certain amount of nutritive value. The mere condiment is a stimulating drug, which does its work directly upon the inner lining of the stomach, exciting it to increased abnormal, activity.

"The dyspeptic may obtain immediate relief by the use of cayenne pepper. Among the patent medicines is a pill of the very ominous name of its compounder—the chief constituent of which is cayenne. Great relief and temporary comfort are commonly obtained by using it as a dinner pill. If thus used, only as a temporary remedy for an acute and temporary or exceptional attack of indigestion, all is well; but whether cayenne is taken in pills, or dusted over the food, or stewed with it in curries or otherwise, it is one of the most cruel of slow poisons when taken habitually. / Thousands of poor wretches are crawling miserably towards their graves—the victims of the multitude of maladies of both mind and body, ~~that are connected with~~ chronic, incurable dyspepsia; all brought about by ~~the~~ ^{over-use of} habitual use of cayenne and its condimental cousins.

“The usual history of these victims is that they began by over-feeding, took to the condiment to force the stomach to do more than its healthful amount of work, using but a little at first. Then the stomach became tolerant of this little and demanded more, until at last inflammation, ulceration, torpidity, and the final death of the digestive powers, accompanied by all of that long train of miseries to which I have referred.”

This is strong language, but it has much truth in it. It has always seemed to me that those condiments which are of a very stimulating, and, perhaps, of a poisonous nature, are not required, and if used to any great extent are positively injurious to the young and to persons in good health, and that if our food is properly cooked all its natural properties preserved and brought out, the demands of the palate and of digestion would be sufficiently served to answer our natural requirements. If the material of our food is not good, if the cooking is bad, we must conceal its disagreeable qualities by condiments.

Many eschew condiments entirely, and to manifest advantage. William Cullen Bryant, in a letter written for *THE HERALD OF HEALTH*, said: “Even with my food I do not take the usual condiments, such as pepper and the like.”

Other accessory foods, such as tea, coffee, etc., will be discussed in the chapter on drinks.

CHAPTER III.

THE DAILY REQUIREMENTS OF THE BODY.

Before considering the daily requirements of our bodies it will be necessary to know what is expected of them, or what they are capable of accomplishing. To this end we need a mathematical form of expression for the work which an average human being is able to perform daily. To secure this we must first convert the various kinds of labor into a common unit. This unit, as has been agreed upon by physiologists, is a foot-ton, or 2000 pounds raised one foot high. The number of foot-tons which can be lifted daily would constitute a day's work.

There are, however, two kinds of work done by the body: one is internal work, such as circulating the blood, respiration, secretion, digestion, and all other kinds of labor except muscular. The other kind is known as external work, concerning which Dr. Alexander Wynter Blythe, in a little book entitled "Diet in its Relation to Health and Work," says: "The external work varies much. A country postman, 150 pounds in weight, walking his daily round of twenty miles, would do work equal to 353.4 foot-tons. Ordinary day laborers, such as we see on the road, probably average 350 foot-tons. In the case of a peddler, cited by Parks, who carried twen-

ty-eight pounds on his back and walked twenty miles daily, the work was 419.5 foot-tons.

“In Weston’s feat of fifty miles a day, I have calculated his daily work to be no less than 793 foot-tons; but this large number was exceeded in a former feat, in which he walked 317 miles in five days, which would give, approximately, 1,010 foot-tons daily.

“A very hard day’s work for most men is 400 foot-tons. At the other end of the scale stand sedentary occupations, for example: needlewomen, the external work of which may fall as low as seventeen or eighteen foot-tons.”

The internal work done by the body can only be estimated approximately. The most reliable calculations have been made of the work of the heart. The left ventricle at each pulsation, in an average man, circulates about six ounces of blood.

The right ventricle circulates the same quantity, but to a less distance; and its labor has been estimated at about one-third of that of the left ventricle. According to nice calculations, the work of both ventricles amounts to about 435 foot-tons daily, which is more than the entire external work of an average laborer.

Of the internal work done by other organs of the body we have no reliable data.

The estimates given by different authorities as to the daily requirements of the body have an interest, though they are somewhat arbitrary. They are made to suit the average laboring man, whose digestion is good and who does a fair day’s muscular work, and are no criterion for sedentary persons or for women.

According to Ranke a sufficient diet for the average worker, estimated dry, should contain.

about 1,543 grains, or 3.2 ounces of proteids,
 " 1,543 " " 3.2 " " fats,
 and 3,703 " " 7.88 " " carbohydrates.

The amount of energy associated with each of those groups of food constituents is shown in the next table.

1,543 grains of albumin	give	426,300	calories,
1,543 " " fat	"	906,900	"
3,703 " " starch	"	938,880	"

Total, 2,272,080 calories.

Foster and Voit make a more liberal and somewhat different estimate of man's daily requirements, as follows:

Albumin	1,820 grains,	3.8 ounces,
Fats	1,930 "	4 "
Carbohydrates	6,053 "	12.6 "

The quantity of nitrogen and carbon in the above diet is as follows:

Nitrogen	. . . . .	282.40 grains.
Carbon	. . . . .	5,061 "

The value of a diet containing this amount of the various constituents in energy is as follows:

1,820 grains albumin	give	503,034	calories,
1,364 " fat	"	801,699	"
5,053 " carbohydrates	"	1,534,600	"

Total, 2,838,333 calories.

Professor Gamgee, in his interesting work on "Food and Digestion," gives in the following table the quality of the different foods which a man

would be required to eat in order to supply his system with the nitrogen and carbon specified in the last table quoted, as follows :

18.3 grammes of nitrogen =

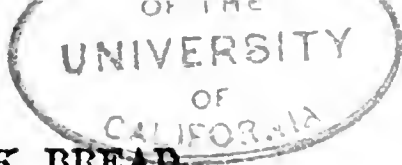
Cheese	272 grammes, *
Lean meat	538 "
Wheaten flour	796 "
Eggs (18)	905 "
Black bread	989 "
Rice	1,868 "
Milk	2,905 "
Potatoes	4,575 "
Bacon	4,796 "
Beer	17,000 "

328 grammes of carbon =

Bacon	450 grammes,
Wheaten flour	824 "
Rice	896 "
Cheese	1,160 "
Black bread	1,346 "
Eggs (43)	2,231 "
Lean meat	2,620 "
Potatoes	3,124 "
Milk	4,652 "
Beer	13,160 "

These tables have no absolute value as guides to our daily diet, but are curiosities which will interest the reader, and they "indicate," continues Gamgee, "how very limited are the substances which alone will supply the body with the proper quantities which it requires of nitrogen and of carbon, and also of energy. Thus, whilst 538 grammes of meat are sufficient to supply all the proteid which the body requires, if meat alone composed the diet of

*To convert grammes into avoird. ounces multiply by 0.0353.



man there would be needed as much as 2,620 grammes to supply all the carbon required; but no man could day after day consume such a great quantity of meat. Even milk, which contains all the various groups of food constituents, is not adapted to supply all the elements of a perfect diet in their proper proportions for an adult man; for while all the nitrogen which the body needs could be afforded by the consumption of 2,905 grammes of milk; in order that the amount of carbon required should be obtained, the milk consumed would have to reach the enormous amount of 4,652 grammes, in other words, over ten English pounds.

It will be observed that there is only one article of diet in each of these tables, namely, black bread, which contains nitrogen and carbon in such proportions that a moderate weight of it is able to supply the wants of the economy for both these elements. From 1,300 to 1,400 grammes of black bread constitute, therefore, almost a standard diet, and it may be mentioned that upon this diet large numbers of men are able to live in health and to accomplish great labors. In some of the departments in the south of France black bread constitutes almost the only food of a vigorous and laborious population."

A receipt will be given for making this black bread in another department. While it contains the elements of an almost perfect nutrition it is very disagreeable to the taste and also difficult of digestion. Only those working in the open air can digest it.

Dr. Edward Smith made inquiries into the food

allowance of several hundred families in England, Wales, Ireland and Scotland, and constructed the following interesting tables :

AVERAGE DAILY DIET OF FARM LABORERS IN GREAT
BRITAIN.

	<i>Dry Nitrogenous Matter.</i>	<i>Dry Carbonaceous Matter.</i>
England	3.18 ozs.	29.32 ozs.
Wales	4.12 "	35.51 "
Scotland	4.76 "	36.30 "
Ireland	4.94 "	34.26 "

The carbonaceous matter in this table, as well as the following, is calculated as starch.

Dr. Playfair has constructed a still more interesting table, giving the amount of nitrogenous and carbonaceous substances in ounces, in different degrees of labor :

DAILY DIET ACCORDING TO WORK DONE.

	<i>Flesh-formers.</i>	<i>Fat.</i>	<i>Starch and Sugar.</i>
Subsistence diet	2.0 ozs.	0.5 ozs.	12.0 ozs.
Quietude	2.5 "	1.0 "	12.0 "
Moderate exercise	4.2 "	1.8 "	18.7 "
Active labor	5.5 "	2.5 "	20.0 "
Hard work	6.5 "	2.5 "	20.0 "

These tables are all constructed from English and German data, where work of this kind has been done much more extensively than in our own country. There are evidences, however, that American scientists will soon give us statistics of this sort of the most valuable kind. On this point Professor Atwater says :

“I think that to fairly meet the demand of the average American laboring man (I mean the man whose labor is done with his muscles; brain-work-

ers who have little muscular exercise need less food, I suppose,) a more liberal allowance than Voit makes for laboring men in Germany is needed. The American "working-man" is better paid, has more and better food, and does more work than his European brother. I should be inclined to quantities more like the following for the nutrients in the daily food of an average man doing manual work:

<i>Protein.</i>	<i>Fat.</i>	<i>Carbohydrates.</i>
For moderate work.		
125 grammes (4.4 ozs).	125 grammes.	400 grammes (14.4 ozs).
For hard work.		
150 grammes	150 grammes.	400 grammes.

"Men at very severe work may often need much more than the most liberal of these rations allows, while men, and especially women, of sedentary habits and elderly people are believed to usually require considerably less than the smallest figures indicate.

"Statistics collected in the United States imply that the quantity of food consumed by many people whose occupations involve only light muscular labor approaches very near to the largest of these standards, and often considerably exceeds it. Indeed, a large array of facts lately gathered very strongly support the teaching of physicians that the failure to fit the food to the demands of the body, and especially the excessive consumption of certain kinds of food, are the sources of untold injury to health and happiness."

Those who are fond of figures will be interested in Professor Huxley's general statistics of the body, as follows:

The average weight of the human body may be taken at 154 lbs.

Such a body would be made up of

	lbs.
Muscles and their appurtenances	68
Skeleton	24
Skin	10½
Fat	28
Brain	3
Thoracic viscera	2½
Abdominal viscera	11
	147
	lbs.
Or of water	88
Solid matter	66

The solids would consist of the elements oxygen, hydrogen, carbon, nitrogen, phosphorus, sulphur, silicon, chlorine, flourine, potassium, sodium, calcium (lithium), magnesium, iron (manganese, copper, lead), and may be arranged under the heads of

PROTEIDS. AMYLOIDS. FATS. MINERALS.

Such a body would lose in 24 hours—of water, about 40,000 grains, or 6 lbs.; of other matters, about 14,500 grains, or over 2 lbs.; among which of carbon 4,000 grains; of nitrogen 300 grains; of mineral matters, 400 grains; and would part, per diem, with as much heat as would raise 8,700 lbs. of water from 0° to 1° F., which is equivalent to 3,000 foot-tons. Such a body ought to do as much work as is equal to 450 foot-tons.

The losses would occur through various organs, thus—by

	<i>Water.</i>	<i>Other Matter.</i>	<i>N.</i>	<i>C.</i>
	grains.	grains.	grains.	grains.
Lungs	5,000	12,000		3,300
Kidneys	23,000	1,000	250	140
Skin	10,000	700	10	100
Feces	2,000	800	40	460
	<hr/>	<hr/>	<hr/>	<hr/>
Total	40,000	14,500	300	4,000

The *gains* and *losses* of the body would be as follows :

	grains.
CREDITOR—Solid dry food	8,000
Oxygen	10,000
Water	36,500
	<hr/>
Total	54,500

	grains.
DEBTOR—Water	40,000
Other matter	14,500
	<hr/>
Total	54,500

Such a body would require for daily food, carbon 4,000 grains; nitrogen 300 grains, which, with the other necessary elements, would be most conveniently disposed in

	grains.
Proteids	2,000
Amyloids	4,400
Fats	1,200
Minerals	400
Water	36,500
	<hr/>
Total	44,500

which, in turn, might be obtained, for instance, by means of those articles of food named below or an

indefinite number of articles might be used from which to select them.

	grains.
Lean beefsteaks	5,000
Bread	6,000
Milk	7,000
Potatoes	3,000
Butter, dripping, etc.	600
Water	22,900
	<hr/>
Total	44,500

The feces passed, per diem, would amount to about 2,800 grains, containing solid matter, 800 grains.

CHAPTER IV.

DIGESTION.

Good digestion is at the base of perfect nutrition. The best food in the world, imperfectly digested, will not be so useful to the animal body as the poorest food well digested. But the digestion of no animal is quite perfect. If it were, then the excrement which passes away would not contain undigested substances. Now this is not the case. The excrements of all animals furnish food for multitudes of insects, and birds feed with avidity on the dung of grain-fed horses and cattle, as farmers well know. The fireman who shovels coal under the boiler of a steam engine knows full well that he must furnish an extra supply, above that theoretically required. Hardly more than twenty-five per cent. of its real value is utilized by the best mechanism yet constructed by man. The remainder is unconsumed, going off in the form of minute particles, or is lost in other ways. Man does better than this; but we all consume more food than we should require if the digestive organs were capable of extracting all its nutritive material.

The following table shows the amount of different foods digested and undigested by man, as found

by very careful experiments made upon a healthy person :

	Parts digested of 100 parts of the perfectly dried solid.	Amount of solid food residue passing away from the body by the alimentary canal.
Sugar	100·00	0·00
Rice	96·00	4·00
Wheaten Bread	95·00	5·00
Roast Meat	94·80	5·20
Hard boiled Eggs	94·75	5·25
Milk and Cheese (in the proportion of 2·4 : 1)	94·00	6·00
Cornflour	93·30	6·70
Milk and Cheese (in the proportion of 2 : 1)	93·20	6·80
Milk, 830 parts of fluid = 100 of solids	91·00	9·00
Potatoes	90·60	9·40
Rye Bread	88·9	11·1
Milk and Cheese (equal parts of dry solids).	88·7	11·3
Black Bread	83·0	17·0
Carrots, Celery, Cabbage	76·0	24·0
Peas, Beans, etc.	52·4	47·6
Gelatin	50·0	50·0

The various degrees of the digestibility of foods have been roughly estimated in the following ways :

1. By experimenting in the laboratory—the experimenter submitting different foods to the action of digestive juices at a temperature of about 100° F. for a specified time.

2. By experiments on living beings, in cases where an opening has been caused by accident or otherwise, revealing the processes of digestion to the naked eye; or by following the stages of stomach digestion and removing its contents at stated periods with a stomach pump.

3. By experiments on living animals, with an ar-

tificial opening into the stomach—a cruel process, but having some value.

4. By analyses of the food eaten and of the excrement which passes out of the body. The latter method is by far the most satisfactory, for it involves no unnatural condition. By it the food is subjected to all the processes of digestion, while in the other cases it is submitted to only a part of them. The foregoing table was estimated by this method.

It does not follow, however, that foods which are not perfectly digested, or which may be difficult of digestion should never be eaten, any more than it follows that difficult work for brain or muscles should never be attempted. The organism acquires strength, under certain conditions, by doing labor which taxes it somewhat severely.

From the table quoted it will be seen that sugar is the most perfectly digested of any of the articles mentioned; and yet sugar alone would not constitute a safe diet. Peas and beans, on the other hand, are rarely perfectly digested, and yet they constitute important foods.

The food in its passage along the digestive track is brought under the action of several digestive juices, the product of the epithelial cells which constitute the mucous membrane, and of the glands which belong to it.

MOUTH DIGESTION.

The first of these juices is the saliva secreted by the various glands connected with the mouth; then comes the gastric juice of the stomach, the bile of the liver, the pancreatic juice of the pancreas, and

other unimportant juices of the digestive track. These juices are poured upon the food, mingled with it, and produce such changes in its character that from being insoluble it becomes soluble, and so modified that if the digestion be perfect the soluble portion of what is eaten is passed into, and becomes a part of, the blood.

Digestion begins in the mouth. During each twenty-four hours the salivary glands pour into this cavity, mainly during mastication, about three and a half pounds of saliva. It is alkaline in its reaction, and contains nearly half an ounce of solid matter, and less than a quarter of an ounce of ptyaline, which is its active principle. The saliva moistens and dilutes the food while the ptyaline acts on its starch, converting a portion of it into grape sugar. It is calculated that one part of ptyaline will convert 8,000 parts of starch into sugar. It produces no action on fat or albumen. Starch is unaffected by saliva unless the coat of the starch-cell is ruptured by boiling or by thorough mastication, so as to expose the starch to its influence.

STOMACH DIGESTION.

The food passes from the mouth into the stomach, where it meets another digestive fluid, the gastric juice. A healthy stomach secretes from fourteen to twenty-five pounds of this juice daily, which contains less than half a pound of solid matter, and two-thirds of an ounce of pepsine, the active agent of digestion.

The gastric juice is acid in its reaction, or exactly the opposite of the saliva. It puts an end for the

time being to the digestion of starch, which had commenced in the mouth. It has no effect upon the grape or cane sugar of our food. It is also powerless to digest fats, consequently any oily matter in the stomach, like starch, remains unchanged. Any albuminous envelope surrounding a fat globule may be digested away, leaving the fatty portion free. Such mineral matter as is soluble in acids is, for the most part, dissolved in the gastric juice. Its chief characteristic is its power of dissolving proteid or albuminous matters, converting them into *peptones*, which can be taken up by the absorbents of the digestive organs, and carried into the circulation.

After the stomach has done all it can in the way of digesting the albuminous matter in our food, it is passed through the pyloric orifice at its end into the duodenum, in an acid condition. Here it meets, and is mingled with, two alkaline digestive juices—first, the bile from the liver, and, second, the pancreatic juice from the pancreas. In a short time it is changed from an acid to an alkaline state. Any albuminous matter which was not completely digested in the stomach, and all the starchy matters not completely digested in the mouth, have their digestion completed here, and the fatty portion of the food is changed into an emulsion, which fits it for being absorbed. Thus we see the main office of digestion is to render the solid matter of food soluble.

The conditions of perfect digestion are several, and may be mentioned here. The first is perfect mastication. If this is not accomplished much of the food is not brought under the influence of the

digestive juices and is so lost. Count Rumford calculated that one-fourth less food is required if it be perfectly masticated. The object of mastication is to break up the particles into a condition in which the digestive juices can be brought into immediate contact with them.

It has been stated that Mr. Gladstone is so impressed with the importance of perfect mastication that he makes a practice himself, and has taught his family to do the same, of giving each mouthful thirty-two bites—one for each tooth in a perfect mouth. It is no wonder that he is able to perform such an amount of intellectual labor.

It is not easy to form the habit of chewing the food thoroughly after one has practiced eating rapidly for a few years, but by determined effort it may be done, as I have many times observed in persons who have consulted me on the hygienic treatment of their diseases.

Several years ago, Prof. E. F. Bacon and myself, and a few other friends eating at the same table, formed a little club, under the name of "The Eat Your Food Slow Society." I was the honored president so long as the society existed, which was long enough for our individual purposes. We had a great deal of merriment on the subject of masticating food, and each member was fined every time he was caught eating rapidly. I think such societies are much needed, and that they might be formed at every table. They would serve to call attention to the subject, and, finally, to aid in forming correct habits of eating.

During digestion the contents of the stomach are kept in a constant state of gentle agitation by the

rythmic, circular, to-and-fro movement of this organ. This is, no doubt, facilitated by gymnastic exercises or deep breathing.

Those who engage in out-of-door labor do not need to make special effort for keeping up the intestinal movement; but sedentary persons, many invalids, and women who dress tightly about the waist often suffer much in health because the muscular movements of the digestive canal are feeble and inefficient.

Digestion is favored by the proper selection of food, and by the right proportion of fats, carbohydrates, proteids and mineral matter. An excess or deficiency of either is injurious.

By the best treatment of food as regards cooking, flavoring and serving.

By proper variety of food, with occasional changes of diet.

By moderate exercise, warmth and a genial state of mind.

By good sleep. Persons who suffer from sleeplessness lose their appetites, and their digestion becomes impaired. Sleep, on the other hand, is promoted by good and suitable food.

By pleasant social surroundings at the table, and by regularity in eating, with proper intervals between meals.

I am a great believer in light conversation at the table. A person who sits alone and eats in silence cannot enjoy his food, nor digest it so thoroughly as one who eats with agreeable people, and enters into the talk which ought to prevail; but it should be light agreeable talk. Politics and theology, business and the trials and troubles of life should

never be mentioned. Every meal should be a festival of cheerfulness and love. We say grace at the table, and this is right; but we should be filled with grace and beauty, then would the words we utter be something more than empty sounds.

CHAPTER V.

THE SOURCES OF OUR FOODS.

Man derives his nourishment mainly from organized matter ; plants theirs from unorganized. It is true that the former may, to a slight extent, be nourished from inorganic material ; and it is also true that some vegetables, mainly the carnivorous plants, feed upon organic matter ; but these exceptions do not disprove the general rule. There are two sources of organized matter on which man feeds : one the animal kingdom, and one the vegetable kingdom. From the animal kingdom we obtain the proteids and the fats—the proteids in the form of lean meat and other tissues, and the fats in the form of fat meat. We also obtain mineral matter from animal food. The animal kingdom furnishes no carbohydrates. From the vegetable kingdom we obtain the proteids, the fats, the carbohydrates and mineral food.

There are also some intermediate products, namely, milk and eggs, which may be called animal products, though they are hardly animal foods, which serve as nourishment for man.

The extent to which each of these sources of food are used varies greatly with race, climate and habit.

In polar regions the main supply of food is animal from necessity, though vegetables are used so far as they can be obtained; but so scarce are they that they may be considered more as luxuries, condiments and medicines than foods. In temperate latitudes the vegetable world is the most important source of food, though animal food is also extensively consumed. In warm climates animal food is used still less, and by far the greatest majority of the inhabitants never use any of it. Animal products are, however, used here to some extent, especially milk. Eggs are less used. I have only just received a letter from a Hindoo who states he does "not remember to have ever eaten an egg."

In our own climate a majority of scientists and physiologists argue that a mixed diet is preferable, and that man is by nature and structure adapted to it. Why this is so it would be difficult to say. We know perfectly well that the vegetable kingdom supplies in rich abundance every element of our food. The fats of the vegetable world are quite as abundant as in the animal kingdom. The carbohydrates are not to be found in the animal kingdom at all; and even the proteids of the vegetable kingdom exist in as great abundance as in animal food. Why, then, eat flesh? There can be but one excuse for it, and that is the force of habit for ages.

In early times, when agriculture had not been developed, animal food was, no doubt, in temperate regions a necessity, as it is in cold regions now; but this is not the case to-day. Every product of the vegetable kingdom, from almost all climes, can be had everywhere. There is no longer any excuse for the slaughter-house and the annual murdering

of millions of animals for sustenance. Many of these animals have been bred and perfected with the greatest care. They have received so much of our thought and labor that they have often become almost human, and are in some respects superior to many of the human race, so full of selfishness and cruelty, even at its best. It may be in making the changes there would be some sufferings and some mistakes, but science must come to our aid, and so must common sense. It has always seemed to me that the help of the chemist and physiologist should be sought in this matter.

Prof. Voit, one of the most eminent German physiologists, and who has made many important experiments on man and his food, recently declared: "I see no reason why man, with well-chosen vegetable food, needs to go to the animal kingdom for albuminous matter." Most certainly if he does not need to go to the animal kingdom for albuminous matter; he does not for fats; and he would go in vain for carbohydrates.

In order to get at something practical, I brought this subject to the attention of an able chemist, Mr. M. B. Manwaring, who has made the subject of food a special study, and asked him to take for his data the known requirements of the body as already given in a previous chapter, and make a table showing what vegetables would furnish the requisite material. His valuable contribution will appear at the close of this chapter.

I am well aware that no sudden change in man's dietetic habits will be made, but it could be brought about gradually. Flesh once a day might be taken, or three or four times a week, as in the majority of

well-to-do families in Germany. Fish, eggs, oysters and milk might be retained, perhaps indefinitely. There is practically little or no cruelty in securing any of these; not that they are absolutely necessary, but people think they are, and so long as they think so their thoughts must find expression in acts; besides, this amount of animal food would suit the requirements of those who can not or will not under any circumstances altogether dispense with it.

It is true that there are some difficulties in adopting a fleshless diet. One is that the habits and customs of society are not built upon a plan for it, and these are not easily changed. A whole family cooking their own food would find little difficulty, providing they all agree; but a single member of it might have so much trouble as to discourage him unless he should be very persistent. And then the style of cooking and the choice of foods would have to be changed. Our present dietetic habits are formed on the rude experience of generations, and they pretty nearly, on our best arranged tables, provide the requisite quantity of fats, carbohydrates, proteids and salts; but the moment flesh is omitted there would be a great deficiency of proteids, unless it were arranged for in other articles of diet. It would be necessary to use, for instance, more oatmeal and bread made from whole-meal flour, also beans and peas—all very rich in proteids. This might interfere with the likes of many people whose nerves may have been trained after the customs of ancestors not far removed from savages.

Then, again, the danger of enthusiasm without

knowledge has to be counteracted. Men and women often take hold of an idea and "run it into the ground." Some dietetic reformers have done this and paid the penalty; others have found it unsatisfactory and gone to the other extreme. I believe heartily in enthusiasm; it moves the world when nothing else will, and it especially moves it quickly without our waiting for the slow process of growth and the regular unfolding of the faculties. But enthusiasm needs to be well balanced and kept on the right track by science, knowledge and common sense, which is, after all, practical, every-day science, worked out by hard experience.

Still, notwithstanding all these difficulties, we might make more rapid progress by giving careful thought to this subject, as we do to other matters not nearly so important.

The advantages of man's return to nature cannot be estimated. That he would become a better man there can be no doubt. The fear that his force of character and energy might be abated is hardly worth considering. In our climate, if well fed on the best vegetable foods, he would have energy enough, but there would be, I am sure, far less of that restlessness and cruelty so often mistaken for energy.

That this reform in our dietetic habits, of which I have briefly spoken, is destined to grow, and sure to become a part of the struggle in our efforts for human progress, as much as temperance or social economy, I have not the slightest doubt.

I now have the pleasure of introducing Mr. M. B. Manwaring, previously mentioned, who, at my solicitation, contributes an interesting chapter.

A PRACTICAL CHAPTER FROM A CHEMICAL
STANDPOINT.

The investigations of scientists enable us to name with scientific certainty the classes of nutrients required by all mankind under any and all conditions. The more recent determinations of physiological chemists also supply us with the necessary data by which to approximate relative proportions and quantities for a typical dietary, the degree of accuracy in any given case depending upon certain conditions approaching or departing from that state of things conveniently termed "average"—that accommodating adjustment of differences which includes all, and yet paradoxically excludes the individual.

Because the individual is but one of a number constituting the average, there must needs be a greater or less modification of quantities, therefore, to a limited extent, each one must be "a law unto himself."

The popular safeguard against deficiencies lies in the use of an indiscriminate "mixed diet," but which carries with it the liability to excess, to say nothing about improper articles of food and miserable modes of cooking.

Having for awhile practically applied the general teachings of science regarding foods, etc., there steps in another reliable advisor of a specific and more personal nature, viz., a normal appetite. That this may be secured, one should conform to the conditions of assimilation of nutrients and the functional expenditure of their appropriated energy, otherwise the *waste* of food materials will defeat his plans by rendering useless the quantity-

estimates of table I. The foods should be properly cooked, *thoroughly insalivated*, and taken at regular intervals; with sufficient fresh air, exercise, sleep, etc.

The following tables are intended to furnish a ready means of practically adjusting the proportions and quantities of *nutrients* needed in individual cases, as also the weights of various *foods*, excluding flesh, required to supply the several nutrients.

TABLE I.

If the approximate quantities of nutrients required daily by a man of average weight be reduced to the needs of a person supposed to weigh 100 pounds, we will have the following figures :

		<i>Protein.</i>	<i>Fats.</i>	<i>Carbohydrates.</i>
		OUNCES.	OUNCES.	OUNCES.
For hard work . . .	}	3.5	3.5	9.5
		or 3.5	1.67	14.7
For light work . . .	}	3.0	3.0	9.5
		or 3.0	1.5	14.7
For the sedentary and those below the average in health, age, etc.	}	2.25 to 2.4	2.25 to 2.4	4.75 to 5.8
		or 2.25 to 2.4	1.0 to 1.14	9.43 to 10.0

As this table is based on the general conditions specified, extraordinary exertion would demand larger quantities of food materials than the maximum figures indicate; and, on the other hand, the invalid and those exceptionably below the average in any particular require less than the minimum quantities named, until better health demands increased quantities.

The difficulties of fixing a standard dietary have already been referred to—the varying internal and

external conditions have each a voice in the matter; but we have endeavored to present a sliding scale, within limitations, which may serve as a general guide to those realizing that a proper dietary means not only quantity, but quality and relative proportions; who know the importance of a proper adjustment of foods, so that the supplies of each class will, as nearly as possible, equal the systemic wants—the waste and repair balancing each other—that disease may be avoided or cured by guarding against either extreme of a partially starvation diet or that of the gourmand. A person may be filled to repletion, and yet suffer from inanition; or may feel comparatively empty, and still be over-fed; hence the common origin of most diseases.

TABLE II.

This table shows the relation between height and weight, or what a person of given height *should* weigh if in a normal condition.

<i>Height,</i>			<i>Weight,</i>	
5 feet	0 inches	=	115 av. lbs.	
5	1	"	120	"
5	2	"	125	"
5	3	"	130	"
5	4	"	135	"
5	5	"	140	"
5	6	"	143	"
5	7	"	145	"
5	8	"	148	"
5	9	"	155	"
5	10	"	160	"
5	11	"	165	"
6	0	"	170	"
6	1	"	175	"
6	2	"	180	"
6	3	"	185	"
6	4	"	190	"

As will be observed in tables III, IV and V, only the *first* column of figures shows the number of ounces required, of a given food, to supply one ounce of the nutrient named at the head of the column; the remaining columns give the quantities of the other two nutrients contained in the number of ounces designated in the *first* column. For example: upon referring to table III, it will be seen that to obtain 1 oz. of protein from cheese we must use 2.63 oz., which quantity *also* contains 0.24 oz. of carbohydrates and 0.184 oz. of fatty matters.

In making use of these tables, consult the first column of table III to find the quantities necessary to furnish 1 oz. of protein; the first column of table IV for 1 oz. of carbohydrates, and the first column of table V for 1 oz. of fatty matters. When the second and third columns show appreciable quantities they should enter into the calculation.

TABLE III.

<i>Foods.</i>	1 av. oz. of		
	<i>Protein</i>	<i>Carbohydrates</i>	<i>Fats</i>
	contained in:	contained:	contained:
	OUNCES.	OUNCES.	OUNCES.
Cheese, skimmed milk	2.63	0.24	0.184
Cheese, whole milk	3.7	0.11	1.26
Lentils	3.7	1.16	0.685
Beans	4.06	2.27	0.081
Pease	4.17	2.45	0.075
Gluten of whole wheat	4.31	2.13	0.259
Flour, whole wheat, except } outer shell }	5.97	3.94	0.119
Barley flour, whole	7.22	4.5	0.13
Oatmeal, common	7.32	5.58	0.449
Corn (maize)	7.81	4.84	0.547
Flour, bolted	8.2	5.62	0.098
Barley meal, common	8.51	6.04	0.145

TABLE III. Continued.

<i>Foods.</i>	1 av. oz. of		
	<i>Protein</i>	<i>Carbohydrates</i>	<i>Fats</i>
	contained in:	contained:	contained:
	OUNCES.	OUNCES.	OUNCES.
Buckwheat	8.77	" 5.17	" 0.228
Bread, bolted flour, home-made	9.09	" 5.0	" 0.182
Rye flour, common	9.12	" 6.51	" 0.182
Rice	14.3	" 11.11	" 0.073
Rye bread, common, home-made	16.13	" 7.77	" 0.077
Pease, very young	16.5	" 2.15	" —
Cow's milk, skimmed	19.61	" 1.27	" —
Cow's buttermilk	20.83	" 1.35	" —
Cow's milk	21.05	" 0.84	" 0.737
Cabbage	37.04	" 2.96	" —
Beans, very young	49.02	" 2.94	" —
Sago	100.0	" 82.0	" —
Butter	100.0	"	" 89.0
Turnips	100.0	" 7.0	" —
Potato, available protein	125.0	" 26.25	" 0.287
Sweet Potato, "	143.0	" 38.18	" 0.329

TABLE IV.

<i>Foods.</i>	1 av. oz. of		
	<i>Carbohydrates</i>	<i>Protein</i>	<i>Fats</i>
	contained in:	contained:	contained:
	OUNCES.	OUNCES.	OUNCES.
Sago	1.22	" 0.0122	" —
Rice	1.29	" 0.09	" 0.006
Oatmeal, common	1.31	" 0.179	" 0.08
Rye flour, common	1.4	" 0.153	" 0.028
Barley meal, common	1.41	" 0.165	" 0.024
Flour, bolted	1.46	" 0.178	" 0.017
Flour, whole wheat, except outer shell	1.52	" 0.254	" 0.03
Barley flour, whole	1.6	" 0.221	" 1.029
Corn (maize)	1.61	" 0.206	" 0.113
Buckwheat	1.7	" 0.194	" 0.044
Pease	1.7	" 0.41	" 0.031

TABLE IV. Continued.

<i>Foods.</i>	1 av. oz. of		
	<i>Carbohydrates</i> contained in: OUNCES.	<i>Protein</i> contained: OUNCES.	<i>Fats</i> contained: OUNCES.
Lentils	1.71	" 0.46	" 0.032
Beans	1.8	" 0.444	" 0.036
Bread, bolted flour, home-made	1.82	" 0.2	" 0.036
Gluten of wheat, whole	2.02	" 0.468	" 0.121
Rye bread, common, home-made }	2.08	" 0.129	" 0.01
Sweet potato	3.75	" 0.262	" 0.009
Potato	4.76	" 0.038	" 0.011
Pease, very young	7.67	" 0.465	"
Cheese, skimmed milk	11.11	" 4.222	" 0.778
Cabbage	12.5	" 0.337	" —
Turnips	14.3	" 0.143	" —
Cow's milk, skimmed	15.38	" 0.784	" —
Cow's buttermilk	15.38	" 0.738	" —
Beans, very young	16.67	" 0.34	" —
Cow's milk	25.0	" 1.188	" 0.875
Cheese, whole milk	33.33	" 9.0	" 11.33

TABLE V.

<i>Foods.</i>	1 av. oz. of		
	<i>Fats</i> contained in: OUNCES.	<i>Protein</i> contained: OUNCES.	<i>Carbo- hydrates</i> contained: OUNCES.
Butter	1.123	= 0.0112	= —
Cheese, whole milk	2.941	" 0.794	" 0.038
Cheese, skimmed milk	14.3	" 5.434	" 1.278
Corn (maize)	14.3	" 1.83	" 8.866
Oatmeal, common	16.525	" 2.357	" 12.598
Gluten of whole wheat	16.666	" 3.862	" 8.235
Cow's milk	28.57	" 1.357	" 1.143
Buckwheat	38.461	" 4.384	" 22.691
Bread, bolted flour, home-made }	50.0	" 5.5	" 27.5
Rye flour, common	50.0	" 5.485	" 35.63
Flour, whole wheat, except } outer shell	50.0	" 8.37	" 33.0

TABLE V. Continued.

<i>Foods.</i>	1 av. oz. of		<i>Carbo-</i> <i>hydrates</i> contained:
	<i>Fats</i> contained in:	<i>Protein.</i> contained:	
	OUNCES.	OUNCES.	OUNCES.
Beans	50.0	“ 12.325	“ 28.0
Lentils	54.05	“ 14.593	“ 31.543
Pease	55.556	“ 13.333	“ 32.608
Barley meal, common	58.48	“ 6.871	“ 41.521
Flour, bolted	83.33	“ 10.158	“ 57.106
Rice	196.07	“ 13.725	“ 152.346
Rye bread, common, home- made	208.33	“ 12.916	“ 100.352
Potato	435.00	“ 3.480	“ 91.35
Sweet potato	435.00	“ 3.480	“ 116.145

We have included in our tables the dairy products, as milk is just over the line that divides vegetable and animal foods. Milk contains all the nutrients, and in such proportions that it is nearer a perfect food than any other of *animal* origin. With bread or other starchy material it is an admirable food for adults. The whole wheat stands foremost as a nearly, if not quite, perfect food. Made into bread and eaten with milk or a little butter it is all that can be desired.

Those, however, who prefer a strictly vegetarian dietary, can substitute olive or cottonseed oil and nuts (especially during cold weather) for butter and fat of meats—the latter is also represented by the starches, sugars and cellulose of vegetable products. Flesh has its counterpart in casein of pease, beans and lentils, gluten of wheat and fibrin of oatmeal.

The cereals generally, or foods rich in protein, abound in all necessary *mineral* matter, largely in the form of *phosphates*—gluten of wheat, whole wheat flour, oatmeal and barley head the list.

Preference should be given to cereals that have been deprived of their outer shell, while retaining the bran coats.

Gluten of wheat is one of the best articles of diet to aid in reducing excessive fatness.

We fully expect to arouse the usual amount of prejudice against the unusual feature of letting the scales determine the amount of food to be taken. All we have to say in extenuation is that we suggest this mode as the scientific and only reliable method.

To the one in a thousand who is as particular about correctness in the weight of food swallowed, as in weight purchased, we would advise,—until the eye and normal appetite are able to portion off quantities with tolerable accuracy,—that he makes a practical use of these tables, which require:

1. Weighing articles of food before and after cooking, until relative weights are ascertained.

2. Measuring the height of the person to find from table II what the weight ought to be.

3. Ascertaining from table I the quantity of each of the nutrients needed per day or meal, figured for what the weight of the person should be.

4. Adjusting from tables III, IV and V the required quantities of an agreeable variety of foods, for every day of the week, sufficient to supply the needed nutrients.

For bulk, or quantity without much nutriment, fruits are most useful. There can also be added such watery vegetables as salads, carrots, turnips, tomatoes, cauliflowers, potatoes, spinach, cabbages, beets, onions, parsnips, squash, pumpkins, etc. The importance of fruits as an adjunct to the foods

rich in nutrients can hardly be overestimated. Among other advantages, the writer has found by actual trial that the vegetable acids are powerful solvents of legumin or vegetable casein.

The foregoing tables include only good foods; and the character and proportions of their constituents show how abundantly the vegetable kingdom furnishes all the nutrients, notwithstanding the popular notion that strength is dependent on a flesh diet.

A word about beans. These are usually difficult to digest, but are so important a food that they can hardly be dispensed with. The outer coat or skin of the bean is the mischief maker, and should be removed for the same reason we peel a potato. To do this, previous to baking, after soaking the beans as usual over night or longer, rub them between the hands. A less troublesome plan is to boil the beans instead of baking them, and then rub them through a colander. Beans should be cooked at least eight hours, and preferably longer.

M. B. MANWARING.

CHAPTER VI.

THE ECONOMY OF FOODS.

There is a true and a false economy in selecting our food. A true economy selects that which is most nourishing, most wholesome and best adapted to the bodily requirements. The question of expense is a secondary matter. I have never taken much interest in any plan calculated to reduce the cost of our daily food to a minimum unless, at the same time, the idea of maintaining the health and strength were considered as paramount. If a man can be fed on a penny a day, and nourished so as to be capable of doing only 300 foot-tons of work, or two-thirds as much as a well-fed man, and if it costs a dollar to feed him so that he can accomplish a full day's work of not less than 400 tons, then the latter food is most economical. It is, however, very fortunate that the most wholesome, nourishing and suitable foods are cheapest, so that a man must be very poor indeed to starve if he knows how to adapt means to ends in the daily rounds of his life. Most of us pay for flavors, delicacies or dainties more than we need to for abundant nourishment. If an article of diet does not suit our taste, no matter how wholesome and nourishing it is, we discard it for something less nutritious but more expensive.

The most economical food is that derived from the vegetable kingdom. The Greek peasant, a most frugal, hardy and industrious person, often capable of bearing great burdens, lives principally on bread, olive oil and fruit, the entire cost of which is rarely over four cents a day. The same is true of the Russian, Italian and Spanish peasants.

Charles Darwin says in a letter on this subject: "I have always been astonished at the fact that the most extraordinary workers I ever saw, viz., the laborers in the mines of Chili, live exclusively on vegetable food, including many seeds of leguminous plants," the whole expense of which could hardly have been over a few cents.

It is very true that hard-working men, living much in the open air, can extract more nourishment from plain, coarse food than sedentary persons, whose powers of digestion have been weakened by debilitating habits; but this does not alter the general fact that vegetable foods are cheaper than animal. I have asked Mr. M. B. Manwaring, author of one of the preceding chapters, to calculate for me some tables showing the cost of protein, carbohydrates and fats in a few of our principle articles of diet, in order that this subject may have a practical illustration. Tables VI, VII and VIII are the result of his studies. I preface them with his letter of explanation.

Bayonne, N. J., Feb. 14, 1888.

DR. HOLBROOK:

My Dear Sir: The following tables complement the preceding by showing what the consumer *actually* pays for sufficient of each food to furnish

a pound of each of the several nutrients, at average retail prices in New York. The basis of the calculations is the *relation* to each other of 14, 7 and 12 for protein, carbohydrates and fats respectively. Should this relation be considered somewhat arbitrary, results at least show *comparative* costs, which, after all, is the real value of such tables.

In figuring the cost of a pound of a given nutrient, allowance has been made for the cost of the other nutrients contained in the food; in other words, when calculating the cost of a sufficient quantity of a food to supply a pound of protein, the relative costs of carbohydrates and fats also in the food have been deducted.

In each table the articles of food are arranged in the order of the comparative cost of *a pound of the nutrient named*, that standing first which is cheapest, and the most expensive last. This order of arrangement of course has no regard to the order of costs or quantities of commercial foods, for the quantities required of the latter vary greatly, as shown by the preceding tables, and a food apparently more expensive than another may actually be cheaper.

The figures are carried out to four places when the amounts are less than even cents, as rounding off would give too high results when multiplied. To express these decimals of a cent in *fractions* would make the figures less easy to handle.

The cost of apples given is the only case wherein I am not thoroughly satisfied. No satisfactory information could be obtained from wholesalers—different apples weighed differently per bbl. Eighteen

or twenty different retail grocers were called on, but there was no agreement whatever as to the weight of a bbl. or a measure of apples. Furthermore, different grocers made a different number of pecks to the bbl., varying from nine to thirteen, etc., etc. As regards some other articles I made my own corrections, for example, potatoes, onions, sweet potatoes, etc. While the legal weights are one thing, the actual weights are quite another. You will notice several curious results—for instance, Table VII, corn, costs .0286 cents per lb., and the carbohydrates in it cost the same. Again, butter at 30c. per lb. costs less than the fat in milk. Here we have labor added and a cheaper product; *but* the price of milk is regulated by the cost of cartage and the loss in transit, which appear to overbalance the labor of butter making.

The number of eggs required to make a pound, was determined by boiling about a dozen or more eggs, removing the shells, and weighing. A curious fact was thereby discovered, viz., that eggs lose water by boiling them in water, the same as if heated in the open air. An egg weighing 55 gm. before boiling weighed 51.2 gm. after boiling thirteen minutes.

While the figuring of these tables was quite complicated, the *results* will enable any one to estimate the costs of a pound of nutrients at *any other* market price, by SIMPLE PROPORTION. An example of this is given in the case of beef, moderately fat, in Table VI. In one case beef at 12 cents costs for a pound of protein .4647 cents, or about 46½ cents; the other at 24 cents costs for a pound of protein 93 cents—double the cost of beef obviously doubles

the cost of all its nutrients, hence doubles the cost of the pound of protein. I certainly would make a point of this so that readers can estimate the cost of nutrients for any *fluctuations* in market prices, or any *variations* in different parts of the country. The great use of these tables is the double one of showing people *how to live cheaper*, and that *vegetable* foods not alone supply all the nutrients, but for much less money, aside from other advantages.

One thing is certain, any reader who does not even take the trouble to *look* at the figures, will see that *any* article of food that precedes another in the tables is *cheaper* than the succeeding article for the nutrient named; and while but few would or could retain in the memory the actual costs of the nutrients, the *order of arrangement* would soon fix itself in the memory; especially the cheapness of the vegetables and the expensiveness of flesh—that corn is cheapest and oysters and lager beer the dearest, etc.

The calculations have been carefully checked, so that they can be relied upon. However, *analyses* vary considerably, and where I could I have averaged them.

Troublesome as it would be, it would be a GRAND THING for some one not only to figure out the costs per pound of nutrients for *all* our foods, as well as the quantities of each food required for a pound of nutrient, but to make out *economical bills of fare* including a good variety, that would supply all the nutrients in sufficient quantities and in the right proportions to each other, for a man of a supposed weight of 100 lbs. Such a scheme would neces-

sitate getting the weights and volumes of foods *after* they are prepared for the table. This worked out and put in a practical shape would prove a great boon to our working classes, as well as to the poor in health. *And* such a scheme *would* be an undertaking.

Yours truly,

M. B. MANWARING.

TABLE VI.

<i>FOODS.</i>	<i>Market Prices per pound. \$ cents.</i>	<i>Cost of One Pound of Protein. \$ cents.</i>
Corn (maize) . . . . .	.0286	.0574
Oatmeal, common . . . . .	.0343	.06
Flour, bolted . . . . .	.0306	.0644
Rye Flour, common . . . . .	.0343	.071
Flour, whole wheat except outer shell	.04	.0777
Pease . . . . .	.0427	.0778
Beans . . . . .	.0516	.095
Buckwheat . . . . .	.043	.10
Potato, available protein—85 cents } per bushel }	.0142	.1235
Onions (bulbs) red, \$1.35 per bushel	.027	.1353
Lentils . . . . .	.10	.1707
Rice . . . . .	.08	.1728
Sweet Potato, \$1.35 per bushel . .	.027	.189
Barley, whole (granulated) . . . .	.09	.193
Barley Flour, common . . . . .	.10	.2054
Gluten of whole wheat . . . . .	.11	.2074
Onions (bulbs) white, \$2.13 per bushel	.0426	.213
Buttermilk, 4 cents per quart . . .	.02	.236
Sago . . . . .	.10	.238
Apples, \$2.00 per bbl. . . . .	.0171	.2482
Mutton, very fat . . . . .	.125	.2717

TABLE VI.—Continued.

<i>FOODS.</i>	<i>Market Prices per pound. \$ cents.</i>	<i>Cost of One Pound of Protein. \$ cents.</i>
Cheese, skimmed milk . . . . .	.14	.287
Cabbages . . . . .	.02	.296
Beef, fat . . . . .	.12	.2974
Cheese, whole milk . . . . .	.18	.312
Codfish . . . . .	.08	.3783
Butter . . . . .	.30	.3881
Cow's Milk, 8 cents per quart . . . . .	.0381	.39
Veal, fat . . . . .	.10	.396
Mutton, moderately fat . . . . .	.10	.4341
Grapes, native . . . . .	.06	.437
Beef, moderately fat . . . . .	.12	.4647
Veal, lean . . . . .	.10	.486
Beef, lean . . . . .	.12	.547
Beef, average . . . . .	.24	.5948
Eels . . . . .	.15	.839
Beef, moderately fat . . . . .	.24	.93
Salmon . . . . .	.25	1.037
Beef, lean . . . . .	.24	1.094
Eggs, 9 7-10 without shell = 1 lb., } 30 cents per doz. }	.241	1.882
Lager Beer, 5 cents per glass of } half pint }	.10	2.855
Oysters, 30 cents per quart, = 1½ } lb. solid }	.20	3.79

TABLE VII.

<i>FOODS.</i>	<i>Market Prices per pound. \$ cents.</i>	<i>Costs of One Pound of Carbohydrates. \$ cents.</i>
Corn (Maize) . . . . .	.0286	.0286
Oatmeal, common . . . . .	.0343	.03
Flour, bolted . . . . .	.0306	.0322
Pease . . . . .	.0427	.0388

TABLE VII.--Continued.

<i>FOODS.</i>	<i>Market Prices per pound. \$ cents.</i>	<i>Costs of One Pound of Carbohydrates.</i>
		<i>\$ cents.</i>
Rye Flour, common . . . . .	.0343	.0354
Flour, whole wheat except outer shell . . . . .	.04	.0389
Beans . . . . .	.0516	.0476
Buckwheat . . . . .	.043	.051
Potato, 85 cents per bushel . . . . .	.0142	.0617
Sweet Potato, \$1.35 per bushel . . . . .	.027	.0657
Onions (bulbs) red, \$1.35 per bushel . . . . .	.027	.0673
Lentils . . . . .	.10	.0866
Rice . . . . .	.08	.0867
Barley, whole (granulated) . . . . .	.09	.0965
Barley Flour, common . . . . .	.10	.1023
Gluten of whole wheat . . . . .	.11	.1037
Onions (bulbs) white, \$2.13 per bushel . . . . .	.0426	.1062
Buttermilk, 4 cents per quart . . . . .	.019	.1181
Sago . . . . .	.10	.119
Apples, \$2.00 per bbl. . . . .	.0171	.1242
Cheese, skimmed milk . . . . .	.14	.1443
Cabbages . . . . .	.02	.149
Cheese, whole milk . . . . .	.18	.1561
Cow's Milk, 8 cents per quart . . . . .	.0381	.1953
Grapes, native . . . . .	.06	.218
Lager Beer, 5 cents per glass of $\frac{1}{2}$ -pint . . . . .	.10	1.427

TABLE VIII.

<i>FOODS.</i>	<i>Market Prices per pound. \$ cents.</i>	<i>Costs of One Pound of Fats.</i>
		<i>\$ cents.</i>
Corn (maize) . . . . .	.0286	.0492
Oatmeal, common . . . . .	.0343	.0507
Flour, bolted . . . . .	.0306	.0553
Rye Flour, common . . . . .	.0343	.0608
Flour, whole wheat except outer shell . . . . .	.04	.0666

TABLE VIII.—Continued.

FOODS.	Market Prices	Costs of One Pound
	per pound. \$ cents.	of Fats. \$ cents
Pease . . . . .	.0427	.0666
Beans . . . . .	.0516	.0813
Buckwheat . . . . .	.043	.0854
Potato, 85 cents per bushel . . . . .	.0142	.107
Rice . . . . .	.08	.148
Lentils . . . . .	.10	.1484
Barley, whole (granulated) . . . . .	.09	.165
Barley Flour, common . . . . .	.10	.1758
Mutton, very fat . . . . .	.125	.2325
Gluten of whole wheat . . . . .	.11	.1779
Cheese, skimmed milk . . . . .	.14	.2474
Beef, fat . . . . .	.12	.255
Cheese, whole milk . . . . .	.18	.2676
Butter . . . . .	.30	.331
Cow's Milk, 8 cents per quart . . . . .	.0381	.335
Veal, fat . . . . .	.10	.3396
Mutton, moderately fat . . . . .	.10	.371
Beef, moderately fat . . . . .	.12	.3977
Veal, lean . . . . .	.10	.4318
Beef, lean . . . . .	.12	.469
Codfish . . . . .	.08	.487
Eels . . . . .	.15	.72
Salmon . . . . .	.25	.89
Eggs, 9 7-10 without shell = 1 lb., 30 cents per doz., . . . . .	.241	1.607
Oysters, 30 cents per quart, = 1½ lb. solid . . . . .	.20	3.253

I have not deemed it necessary to enlarge these tables so as to have them include all articles used as food, interesting as it might have been. The reader can make similar calculations for himself if he wishes. I only desired to show that in practic-

ing economy in food the true way is to use the best foods from the vegetable kingdom, and less meat, bearing in mind always that articles which contain a large amount of protein are needed to supply the deficiency caused by the use of less flesh. It will also be noticed that the mineral matter of our food has been omitted from the calculation. The omission, however, can not have any perceptible effect on the expense of food, important as it is as an article of nutriment.

It should be borne in mind that while the constituents of some of the foods are low in price, yet the quantity of them in a pound is so small that a sufficient amount to meet the requirements of the body could not be obtained without consuming more than the digestive organs could manage. This is seen conspicuously in the case of the potato. It would require nearly $23\frac{1}{2}$ pounds of this vegetable to furnish 3 ounces of protein—an amount sufficient for a person weighing 100 pounds and doing only moderate work. This would at the same time furnish seven or eight times as much carbohydrates as are required. Milk is another example. It would require about six pounds of milk daily to supply the protein for a man doing only moderate work and weighing 150 pounds. This would also supply him with about two-thirds of the fat required, but not nearly enough of the carbohydrates.

I ought, perhaps, to remark that writers on dietetics tell us that animal food is more easily digested than vegetable, and also that more of it is absorbed in the digestive processes, and, consequently, there is less tax on the organs of digestion, and this should be considered in discussing the economy of any

food. There may be some truth in this, for those who have long habituated their stomachs to flesh, and who have debilitated them by sedentary and unhygienic habits; but for those, who have lived in a more healthful and natural manner, I believe this objection has little or no force. The digestive organs, like all other organs of the body, are subject to the law of habit, and they do that most easily which they have been accustomed to do.

Sir William Thompson says: "The meat eater's digestion is taxed with a far less quantity of solid food, but that very concentration in regard to quality entails on some stomachs an expenditure of force in digestion equal to that required by the vegetable eater to assimilate his much larger proportions."

It must not be forgotten that economy of food is promoted by a right relation of the proportions between its various constituents. Fats and starches cannot serve the purpose of protein. Protein, on the other hand, may take the place of the carbohydrates or fats, but only at a loss of 47 per cent. of the total amount transformed and used for producing heat.

Something might be said of economy in food by saving rather than wasting. Very few know how much valuable material is thrown away. This is a fault of the rich and poor alike. Some years ago I asked a wealthy patient if he would have an estimate made for me of the number of pounds of flesh used by each person in his family, including his servants. A few days later he brought me the statement that three pounds was about the amount purchased for each one; "but," he added, "I think two-thirds of it is wasted." The poor add to the expense of liv-

ing because they purchase such small quantities at a time; because often from pride they choose the most expensive articles, and because they do not prepare it so as to make it all available to the system.

It is poor economy to buy stale vegetables, even at a reduced price. Fresh flour, fresh fruits and other articles are both healthier and more nourishing than if old. Even before decay has actually set in there has been a molecular change in the constituents of the food which renders it less nutritious.

There is also a loss from cooking some things too much or too little, and both these evils must be avoided.

I am certain that there is a loss of nutriment in cooking most of our fruits. The real value of them cannot be determined by chemical analyses. Some of their properties are so subtle as to elude our grasp, but we feel their effects when we take them into our systems in refreshment. They no doubt act largely through the nervous system, and may be electrical in their nature. Cooking destroys this. I do not say that these articles should never be cooked, but only that there is loss in cooking them, especially if we can eat them perfectly fresh and alive. The life, the soul of fruits are lost in cooking. The child understands this. With what delight he looks on the apple, the pear, the peach, the grape! How he longs to clutch them in his hands and to hurry them into his mouth! If used rightly their value to him is inestimable.

In urging a larger use of vegetable food I do not forget that most persons who prepare food have given more attention to the preparation of animal substances than vegetable, and so as a matter of

economy it will pay well to reverse this order and give vegetable foods more attention. Dr. B. W. Richardson says on this subject: "Up to the present time so much more skill has been developed in the preparation of animal foods for the table than has been bestowed on vegetables that in order to give the vegetarian system the faintest chance a new school of cookery will have to be introduced in which there shall be taught not only modes of cooking, but the actual dietetic value of everything cooked and sent to the table."

Sir James Paget estimates that the time lost in England and Wales yearly from sickness amounts to 20,000,000 weeks. This includes only losses of those between fifteen and sixty-five years of age, and does not include the trivial headaches and pains which do not keep one from his labor. If to this is added the sickness of those under fifteen and over sixty-five the loss becomes appalling. It is probably more in this country.

It should not be forgotten that any food which promotes health and strength has in it an element of economy of the highest value. There can be no doubt but the waste of time and strength, and the expense of medical attendance which, in the aggregate, is an enormous sum every year, would be reduced at least one half by choosing the best foods, and preparing them in the best manner. This can only be done by studying the subject as a science and as an art. *Materia Medica* is an important study in all our medical schools. *Materia Alimentaria* should be a still more important one for every human being. Until this is the case economy of food, in its highest and best sense, will not be accomplished.

A PRACTICAL LESSON.

As a practical illustration of economy in food, together with improved health, I give the following letter, among many in my possession, not as a model for others, for I know well enough that no two persons are alike in their needs, but to illustrate a principle. The letter is from Mr. A. H. Frank, a well-known inventor and manufacturer, whose machines have a world-wide use. Mr. Frank's letter is so full of interest that I shall give it entire and in his own words.

Buffalo, N. Y., March 21, 1888.

DR. M. L. HOLBROOK :

Dear Sir—I am in receipt of your letter of the 20th inst., reminding me of my promise when in New York to write you something of my manner of living, its cost, etc. I have experimented considerably during the past six years. Previous to that time I ate a mixed diet, eating more or less flesh meats; I ate very sparingly of pies and cakes. The last three or four years of my eating meat my stomach was very weak. The last year I could not eat a full or average meal. At the age of fifty-eight I was what you might call a pretty well used-up man. Six years ago last August I discarded all flesh meats and animal fats, and have since that time greatly improved in health. I have had no further trouble with my stomach, unless I am careless and eat too much, which is the only thing I have to guard against, as I have such a good appetite three times a day every day in the year, and my food tastes so delicious that, unless I am very careful, I eat too much before I am aware of it. Tea and

coffee I place with tobacco and alcoholic drinks, and use none of them. I have not drunk a cup of tea since I was twelve years old, and never drank three cups of coffee in my life; I am past sixty-four, have excellent health, can do fine work, or read without spectacles—never use them. I can do more work, either mental or physical, than on a mixed diet. I discarded butter and milk at the same time I did meat; after about three years I backslid, so that I used milk for a while. It seemed to agree with me, but all the time I felt that it was degrading to employ an old cow to eat for me, and wrong to rob the calves of what belonged to them, while I had an abundance of better food. I am free now, as I am weaned, and shall never eat it again. When I once get my foot on a bad habit and make a pledge, or say I won't, it is for all time. I made several pledges over a half century since which have never been broken. I never drink at my meals, and seldom at any time, as it is often months at a time that I do not experience thirst.

My principal food is fruit and bread with no salt with either; there is plenty of pure water in the fruit. I occasionally eat vegetables, which I salt a little; I can't see that it makes any difference whether I eat salt or not. For three years I did not eat one ounce of salt. During that time I scarcely touched potatoes or other vegetables. I like them; do not think them very bad, and as they are more palatable with salt I use it; yet I think if I were to let them entirely alone and eat only the carrots, beans, peas and lentils, fruits and nuts, rich in vegetable oil, it would be quite as well.

There is a great saving in living the way I do in

cost of food and the labor required to prepare it. I can live on anywhere from two to twelve cents a day. I feel just as well and strong when I eat what I can buy for two or three cents at retail as when I pay ten cents, but it is plainer than I care to live I have tried it and did two men's hard work, eating nothing but one pound of corn a day. I felt just as well and could see no difference in my strength than when I ate a greater variety. One pound of wheat which costs less than two cents, and two pounds of apples, which cost still less (buying by the barrel or bushel), are more than a day's rations. If I add pears and grapes it doubles or trebles the cost. If families would adopt this plain, simple mode of living, none need want for food, and the pleasure of eating would on the average be increased four-fold. The housewife would also be relieved of full four-fifths of her labor in the kitchen, and doctors' bills would soon be reduced nineteen-twentieths, if not entirely dispensed with, intemperance banished from the land, and the average length of life doubled in two generations of time. There is not wealth enough in the State to hire me to eat and drink as do the average of mankind.

I will now describe how I make gems. I weigh my flour and water, then I know just what I have, and there is no guesswork about it. I use one pound of the best unbolted wheat flour to one pound water; I use a cast iron gem pan with eleven cups, which takes one pound of flour to fill. I heat the pan as hot as a quick oven will heat it; I stir the flour and water thoroughly and fill the gem pan as quickly as I can and bake as fast as it will bake without burning. If baked quickly they will be light. I have

made gems several hundreds of times in succession without having one heavy or soggy. If the pan is hot when filled and the oven hot, it forms a thin crust quickly which holds the air and steam, the expansion of which will make the gems light every time. In some instances I have had the gems burst with so much force as to jump out of the pan. A little salt can be used if preferred.

I have stopped at my office long enough after the regular working hours to write what I have written. My day's work commences usually at 4.30 o'clock, A. M., and ends at 5.30, P. M., after which I drive two miles and care for my horse, and often do my cooking. I retire at nine o'clock.

Yours very truly,

A. H. FRANK.

I will extend this chapter to give one more case related by Meta Wellmer in *Almonds and Raisins*, for 1888. This writer says: "Ten years ago, in company with two gentlemen and a lady, I undertook a pedestrian tour to the banks of the lake of Geneva. In T., near Zurich, we visited a teacher, Mr. B. Arriving just at noon, when the family were about to dine, we were kindly invited to join their repast. But having just then sworn loyalty to the Pythagorean mode of life, we used only bread and fruit; and had already eaten our meal at eleven o'clock, under the shade of the green trees, in sight of the beautiful lake and the snow-capped heights. Round the table sat Mr. B. and his wife and six children; the seventh, nine months old, was creeping, baby fashion, energetically on the floor. The meal consisted of cauliflower, roasted potatoes with cucumber salad, bread, fruit and nuts.

“After the meal was ended, Mr. B. accompanied us a short distance on our journey, and told us a little of his life’s experience. ‘I have lived,’ he said, ‘without animal food for more than eleven years, and in spite of my increasing family, I have saved enough money to buy the house in which I live and the garden surrounding it. Not one of those among my colleagues, who have had no inheritance, and have married for pure love, without gaining any dowry, possesses a house. My neighbors wonder at my success, and say I must have inherited money or won it in the lottery ; but the fact is, that my sole gain and inheritance consists in my method of living ; whereas, with other people, all inheritance and gain is lost by going into their mouths and down their throats. Had I adopted this method twenty-one years ago, when I entered my profession, I might now have owned a villa, like the neighboring merchants, and been able to let it to a tenant. But my savings increase year by year, and I have one advantage over some of my rich merchant friends, viz., that of perfect health, which they do not enjoy, living, as they do, contrary to the laws of nature. For eleven years neither doctor nor apothecary has had a penny of mine.’”

CHAPTER VII.

SIMPLICITY IN LIVING.

Closely allied to economy in living is simplicity. In this respect we do not need to go to extremes. True simplicity favors health, and in addition to it limit expense and saves the time wasted in the preparation of numberless complicated dishes.

For children, simplicity is of the greatest importance whatever system of dietetics is adopted. This has been recognized the world over, even by the rich and by the learned. There can be no greater error in rearing a child than indulging its appetite in every sort of costly and unnatural viand. That its food should be nutritious and abundant no one denies. That its food should be appetizing and pleasing to its palate is self-evident; but true luxury may go hand in hand with simplicity. It is the good appetite that makes food taste sweet and give enjoyment; without this nothing pleases. The same rule of simplicity applies to invalids as well as to children. They are often fed exclusively on milk, or are advised to eat largely of fruit, or brown bread, or baked potatoes and cream, or baked apples, or bread, milk and fruit, as the case may be.

But if simplicity is proper for the child and for the invalid, why is it not also for the strong? It is. What examples of simplicity were those of Sidney Smith, whose society often attracted the wealthy to share his single dish; of Isaac Newton, who lived in the plainest way when thinking out his greatest works; of Franklin in his early life; of William Wordsworth; of Socrates, who taught that "men should abstain from meats which might cause a man to eat who had no need for food, or to drink without thirst." His wife, like many before and since, expecting guests, had made, she feared, inadequate provision for them. He replied: "If they be honest men it will be enough; if not, what need we care for them?" These are cases of simple living but high thinking. "Read the lives of our great men," says Prof. J. B. Mayor, "read the story of their greatness; read of Hannibal and St. Paul, of Luther and Newton, of Wesley and John Howard, and you will find temperance (simplicity) at the root of all their virtues." The same author, whose own life is one of most beautiful simplicity, continues:

"This, then, is my first argument for plain living: it is a mighty bond between class and class. It breaks down a wall of partition between us and saints of old; it is the casting off a weight that we may start fair for the race set before us. In two ways we can make people better off: by adding to their means or taking from their wants. The poor cannot ape the diet of the rich without ruin; the rich may take to the diet of the poor with infinite gain to mind, body and estate. Whence come diseases? 'From the kitchen,' say Plato and Seneca

and Milton. *Multos morbos multa fercula fecerunt*, 'So many dishes, so many diseases.' 'Do you wish for health,' asked Abernethy. 'Live on sixpence a day and earn it.' Many say to me, 'You must be strong to bear what you do; living on 2d. a day, indeed; for shame!' I tell them: 'Your feasts, where there are twenty or thirty dishes, with a chaos of some hundred ingredients, hot and cold, sweet and sour, and several sorts of wine—this has been my cross. To try experiments in simplicity and cheap living is a source of great amusement to me.' Seneca puts it neatly: 'It isn't the living on bread and water that is the happiness; but the being able to be happy even on bread and water.'

"Supposing nothing was spent in London this next month on fleshmeat, tobacco, opium, strong drink, tea, coffee, drugs, spices or other poisons, what a surplus you would have! You could have fruit with every meal, and set farmers to work planting orchards; you could have fresh vegetables and treble the number of gardeners; money to buy books and time and brains clear for reading them; bakers might learn to provide genuine wholemeal bread, and every one might have bread to spare; every child, and for that matter every man and woman too, could have a cup of milk with every meal. Then the whole army of adulterators who make things for sale and not for use, the gentry who deal in oleomargerine and butterine and all else that ends in *ine*, would fall on their knees, crying, '*Peccavimus*, do teach us some honest trade; puffing and lies have lost the ear o' th' world.' Being no longer enemies of the cross of Christ, whose end is perdition, whose god is their belly, who mind

earthly things, we should know that our citizenship is in heaven. Verily old Hesiod is right: 'The half is more than the whole.' And remember another of his sayings: 'Well begun is half done.' Begin to-morrow morning, begin wisely, and you will never repent. Or if you must go once more to the school of experience, that mistress of fools, make an honest experiment. Next time you are asked to a great dinner, say: 'My host is my friend; he wishes me well; he wouldn't give me poison if he knew it; I am safe with him.' Eat and drink whatever is offered whenever you have the chance; and send for the doctor that night and next morning and the morning after that. Mark your own symptoms and the doctor's report. Do the same another time, with one exception: fast the second day. You will learn two lessons: (1) Enough is better than a feast, for feasting is folly; (2) Fasting is no cunning trick of priestcraft, but the most powerful and safest of all medicines. Having learnt yourself, begin to teach. When thou art converted, strengthen thy brethren. Issue flaming posters with a good clap-trap title. Fragments of science for the unscientific! How to be healthy, wealthy and wise! How to sup for a penny and rise next morning a wiser and a merrier man!"

There are benefits which come from simplicity which we can hardly estimate. The first is to woman. In most cases, how great are her cares; from early dawn to late at night she struggles and strives. How much of this struggling is to cook intricate dishes for her family and for her friends. "They expect," she says, "something more than a simple repast; they expect elaborately prepared

food to tickle the palate and delight the eye." To some extent this is true, but it is not so true as many believe. Most persons feel themselves more than compensated when they eat with their friends if the food be simple and good, provided thought is stimulated and the spirits are enlivened and refreshed. I have demonstrated this many times by giving simple but well-prepared and appetizing breakfasts without show or parade, and had my guests universally arise from the table with enthusiastic words of praise over the delightful time they had had. I have known many others to do the same with similar results. On the other hand, how often have we all been pained when visiting friends, that so much of the time of the head of the house was given up to preparing food, which might have been dispensed with to the advantage of all.

The other benefits are the invariably good appetite which comes from simplicity, the good digestion which comes from a well-treated stomach, the saving of time which can be devoted to higher pursuits, and of money always needed for so many uses.

Perhaps my readers will say, "Those who work must eat." To this I heartily agree, and I will quote a line from Prof. J. E. B. Mayor, M. A., who says: "I am bound to testify, having known Cambridge for thirty-six years, that the ordinary life of the men *by whom the work of the University is done is simple in the extreme.*" So it has always been; so it will always be. The world's workers live on wholesome, nourishing, but simple food. Even Kaiser William, the German Emperor who died at ninety-one, would not eat the rich viands of his chief cook, but demanded the plainest fare.

CHAPTER VIII.

FOOD AND INTEMPERANCE.

There are a multitude of remedies for intemperance in drinking, some of which are advocated with a zeal which knows no bounds. In my opinion progress in this direction must be largely the work of education and the diffusion of correct knowledge of the true value of life, and perfect control of all our faculties. When human beings have a good understanding of the great happiness which may come from perfect bodies and splendid health, and when they know that these conditions can only be secured by obedience to nature's laws of the body, then they will prize a knowledge of these laws and in some measure, at least, conform their conduct to them.

And, now, what are the causes of intemperance, that hideous nightmare that darkens the lives of so many of the children of the earth, that blights so many homes with a curse more terrible than an Egyptian plague. It is not possible here to go into this subject in all its fulness; but a principal cause, intimately connected with our daily food, may be mentioned briefly. The craving for stimulants, aside from the force of habit, hereditary and acquired, is, in a majority of cases, evidence of im-

paired vitality and deficient nerve force, the result of defective nutrition, either from insufficient or badly prepared food, or from a breaking down of the digestive functions by indulgence in excessive and over-stimulating articles of diet. In either case the results are mal-nutrition and deficient nervous energy. If I am right in this statement, then the greatest foe to intemperance is the sanitarian, and especially the sanitary cook who knows how to feed people perfectly, so as to nourish them completely.

When a man is thoroughly well he is always happy. It matters little whether he be rich or poor, learned or unlearned, his spirits overflow, and he has buoyancy and joyousness to spare. He has such a fulness of life that existence becomes a delight, and he thanks Heaven for it. What does such a person want of stimulants? They actually depress him. On the other hand, those deficient of vitality, or those whose nervous systems are so starved that they do not give out sweet music with every breath; those who are poor spirited; those whose hands and feet are cold, or who are depressed and downcast and feel that they are forsaken; those who have overworked or eaten too much, or gone without food and sleep, are the ones who are most likely to have cravings for drink. Who has not known even temperate people when in this condition to take a little wine or beer to lift themselves up for a moment to the level of the healthy man?

Men and women take to stimulants not only to overcome exhaustion, but to drive away sorrow and care, even to drive away dullness and stupidity; but would men and women be dull, exhausted

and stupid if they were full of animal vigor and overflowing with strength?

So I repeat what I said before: That the greatest foe to intemperance is the sanitarian, the health reformer, and especially the sanitary cook, who lead people into healthful habits of eating and drinking, of working and sleeping, of recreation and study.

Every nutritious and healthful meal, neatly spread and partaken with thankfulness, is a temperance lesson. Every well-built house, with conveniences for doing work easily and without waste of force, with well-arranged kitchen, bathrooms, sunny windows and good ventilation, is a temperance sermon. Every vegetable garden, rich with nutritious food, and every fruit farm abounding in luscious apples, grapes, peaches and pears is a foe to intemperance. Every school where there is no overcrowding, where the brain is properly taken care of, so that it shall not be deranged, promotes temperance. On the other hand, everything that tends to lower human vitality: overwork, over-study, too little sleep, too little work, and especially bad food—all prolong the time when intemperance will produce its evil effects. Every bad cook who prepares unsavory, indigestible meals creates a demand for stimulants.

Dr. Brunton, in a work of great originality and extensive research, on "The Physiology of Digestion," says what will be applauded by all: "Good cooking is one of the most effective means of stifling the craving for drink, which is the root of so much evil. Drink craving, in truth, depends as often as not on causes of a purely physical nature. Bad

cooking is one of the causes of unequal thirst, and the 'demand' thus created leads very naturally to a 'supply' in the shape of alcoholics. The mental phase of contentment which supervenes on the digestion of food which has been savory and well cooked is a powerful stimulus to temperance; just as the opposite condition of badly-cooked meals suggests a remedy in the shape of liquor, which is often consumed under such circumstances greatly in excess of any needs the body may, physiologically, exhibit for alcohol. This is well seen in Switzerland, where, when the food is by no means of a savory kind, a glass of 'schnapps' is resorted to for the purpose of 'tempering' the meal, and of rendering it more appetizing. There is probably a mental effect produced by a pleasant, well-cooked meal, which affects the brain and nervous system in an appreciable manner, but one at the same time difficult to explain. Be this as it may, there seems no reason to doubt that good cookery and temperance are sworn allies; carelessness in preparing food, and, it may be added, in feeding at large, is the equally stanch ally of intemperance and excess."

CHAPTER IX.

ALIMENTARY PRODUCTS OF THE VEGETABLE KINGDOM.

I will in this chapter consider some of the important alimentary products of the vegetable kingdom.

WHEAT.

The most extensively used and most important is wheat. There are many varieties, differing somewhat in chemical composition, their general characteristics being the same. The outer portion of the berry is composed of an exceedingly dense, hard layer, very coherent, and of a woody nature. It protects the valuable nutritious, starchy and nitrogenous material within. It is indigestible. Below this is a layer of albuminous or nitrogenous material, containing a trace of fat and considerable mineral matter. This layer has very high alimentary value; and by the older processes of milling was partly separated with the bran; by the modern and improved method it is mostly saved. A portion of the nitrogenous matter of this coat is known as cerealine, and has some value as a digestive fer-

ment, helping to change starch into dextrine. The central portion of the berry is composed mainly, but not altogether, of starch.

Wheat is rarely used in its entire state as an article of food. There is, however, a growing tendency to the use of whole wheat, or at least to the use of all except the thinnest outer cuticle. There is no doubt that this would be a great advantage to most persons, both from the standpoint of health and nutrition.

The "whole meal" from which nothing has been separated contains (as given by Blythe) the following:

Water	14.0
Nitrogenous substances, part of which is gluten, a portion of which cannot serve for nutrition	} 21.8
Carbohydrates: Fat, 1.2; Starch, 59.7 . . . . .		60.9
Woody Fiber, Cellulose	1.7
Mineral matter	1.6
	100.00

The white flour from which the bran has been separated has, according to this authority, the following composition:

Water	16.5
Gluten and other nitrogenous bodies	8.59
Nitrogenous substances not albuminous	3.41
Carbohydrates: Fat, 1.2; Starch, 69.6	70.8
Mineral matter . . . . .	.7
	100.00

By glancing at the analyses it will be seen that wheat has one important defect. It is almost en-

tirely deficient in fat; but it contains a very large amount of carbohydrates and of albuminous matter.

We add butter to bread to supply this fat.

A BEAUTIFUL MICROSCOPIC OBJECT.

A beautiful object for the microscope is a very thin section of this grain. Almost any person may prepare one by soaking a kernel in warm water until it becomes soft, and cutting it with a very sharp razor. The cuticle or bran, in two or three not very well defined layers, is outermost. Just under it is a layer of gluten cells, nearly square. The gluten granules are thickly packed within. They are darker colored than the starch cells, which lie immediately beneath and extend to the center. The latter are filled with shining starch granules of many sizes. Altogether it makes a very beautiful and interesting picture.

Wheat is prepared in an almost endless variety of ways for food; but in this place I will mention only one which is less known than others. In my boyhood days I was rather fond of experimenting on food products—a trait I have not entirely lost, else I never should have prepared this work. I said to my good mother, who always indulged me in my experiments, “Why can’t wheat be boiled like rice and served with sugar and cream?” She said, “Try it.” So I took some nice white wheat, boiled it till thoroughly cooked, and served it up with cream and sugar, much to my own delight and that of others. This is a very simple, cheap, nutritious and easily digested dish, the only danger being in eating it unmasticated. It requires for each mouthful the thirty-two Gladstonian bites.

OATS.

The oat, less used than wheat as a food for man, is in some respects its superior, for it contains considerable oil. Under the microscope its structure is seen to be similar. Prof. Blythe says: "The oat possesses all the constituents necessary for the maintenance of high bodily vigor, and is one of those complex foods that, especially with the addition of a little fat, is capable of supporting life for an indefinite period. In the border forays of the twelfth and thirteenth centuries the provisions carried by the Scotch was simply a bag of oatmeal."

For centuries it has been a prominent article of food among the Scotch; and it is unfortunate that as its use is being largely extended in other civilized countries it is less used there, especially in the towns. The reason given for this is the desire of the young people to live as other people do, upon hot biscuit and fine bread. The injurious effects of this change can already be seen.

The average composition of oats is given in the following table:

Water	12.93
Nitrogenous matters analogous to gluten	9.78
Nitrogenous matters which do not serve } for purposes of nutrition }	1.95
Fat	6.04
Carbohydrates: Sugar, 2.22; Dextrine and } Gum, 2.04; Starch, 51.17 }	55.43
Woody Fiber	10.83
Mineral matter	3.05
	<hr/>
	100.00

THE MOST STRENGTHENING FOOD.

A German author, Dr. Winckler, writes as follows concerning oats as a food for man :

“Of a very powerful man we often and truly say : ‘He has the strength of a horse,’ ‘He has a horse’s nature,’ or ‘He can maintain himself against the strength of a horse.’ The working power of a horse is so considerable that we measure the power of machinery by ‘horse power.’ Watt and Boulton measured the power of horses in the London breweries and found them capable of performing 33,000 foot pounds per minute. Whence does the horse derive his wonderful strength ? From oats. But the oat does not grow for the horse alone. Man can employ it for nourishment, and is able to prepare from it many delicious foods and drinks which render his body large and his strength enduring.

“The old Germans, whose soldier-like forms and great bodily strength excited the astonishment of the Romans, lived chiefly upon oatmeal porridge, according to the positive evidence of Pliny. The oat was, therefore, the food of our forefathers, who evidently at some time brought it from their Asiatic homes. The Romans learned of the oat from the Germans and the Celts. The German races long maintained this as their original national food. In the eighteenth century we still find that the youth in many parts of Germany were brought up principally on oatmeal porridge. Now, unfortunately the potato is the daily food of the poor people, and only in Scotland is oatmeal the national dish. We all know that the Scottish Highlanders are the most

muscular men in all Europe, and the Scottish regiments form the flower of the British army.

“That the oat is a food of the first rank one may know from its chemical composition. Its constituents are mixed in such proportions as to form an almost ideal diet for the human body, as a comparison of them with mother’s milk, the original type of food, clearly shows.

“The milk of a healthy woman contains in 1,000 grains, 110.16 grains of solid constituents, and in these 110.16 grains we find 14 grains of nitrogenous material, while in 100 grains of oatmeal there are 14.39 grains of the same. This remarkable agreement is confirmed by practice, for we can feed a suckling child with oatmeal gruel; and the best kinds of children’s prepared foods made to replace the mother’s milk consist mainly of oatmeal.

“The constituents of the oat in starch amounts to about 50 per cent. Its fatty matter is very considerable. Oats and corn surpass all other cereals in this respect. Wheat contains only 1.8 per cent.; rye, 2.25 per cent.; barley, 2.76 per cent.; while the oat contains 6.4 per cent. of fat. For this reason the oat is especially useful in cold climates, where a greater amount of fatty food is necessary. Very important also are the salts of the oat, consisting as they do of mineral substances, important for the blood and required by the tissues. In this regard the oat exceeds other grains.

“In wheat there is from 1.4 to 1.9 per cent. of mineral matter; rye contains 2 per cent.; barley, 3.1, and the oat 3.25 per cent. In 100 parts of the ash of the oat, according to Bibra, we find 19.24 of potash; 2.24 of soda; 3. of lime; 6.03 of magnesia;

25.14 of phosphoric acid; 3.07 of sulphuric acid; .39 of silica acid; 1.66 of chloride of sodium, and .42 of oxide of iron. The oat has also a very fine aroma, which stimulates digestion. Owners of horses well know how favorably it affects the appetite of those animals. Every food possesses an aroma to a certain degree; but that from the oat much surpasses the aroma of other grains.

“Foods prepared from the oat prove to be a most certain means of strengthening the body when all other so-called strengthening foods leave us in the lurch. I know of no means of resurrecting a broken constitution so good as using oatmeal gruel freely; and I know that weak persons in their advance toward health and strength will thank me for this advice.”

Lean and debilitated persons can often, and in the shortest time, “feed up.” Pale-faced young women, and women debilitated from confinement, whom we constantly see growing worse under a diet of beef steak and beef tea, and wine and iron preparations, often become blooming as soon as they are properly nourished upon oatmeal broth and oatmeal soup, to which should be added an out-door life. It is also excellent for badly-developed children, more especially during those years devoted to school life—a period which makes extraordinary demands on the childish organization. In short, the oat, in its varied forms, is an invaluable source of strength for both the sound and the unsound. It requires the same thorough mastication as was mentioned for wheat, otherwise it will not be perfectly digested. Some people think that they cannot eat

oatmeal. Let them masticate it thoroughly, and they will very rarely find any difficulty from this cause.

THE COOKING OF OATMEAL.

Scotch or Irish meal is best, because so perfectly clean and white; but these take a longer time to cook than the American steam-cooked preparations, and are not to be had everywhere. If the former are used, from an hour and a half will be required to cook them perfectly, and perfect cooking is of the utmost importance. A pot lined with agate or granite should be used, of a size large enough to allow the meal to swell, which it does considerably. When the water boils up briskly stir the meal in slowly, using a wooden spoon. Do not let it boil over, as it is the best and creamiest part that foams at the top. About half a pound of meal is sufficient for four pints of water. Keep stirring it gently until the porridge has become moderately thick, when it may be set over a slower fire and cooked till it is done, remembering to stir it occasionally. It is best to leave the spoon in the pot, as this helps to prevent burning and spoiling the porridge. The degree of thickness will depend on circumstances. For hard-working men, and those with strong digestions it may be quite thick; but for children and invalids less so.

If steam-cooked cereals are used, it certainly is a great saving of time, though the flavor is not so fine nor the strength so great; the process is the same, only a little less water is required, and from twenty to thirty minutes are sufficient for preparing them. When poured from the pot it should

have a creamy appearance. It will thicken a little after it is taken out. The amount of salt required will depend on the taste. I prefer a small amount; and if not enough is put in more may be added afterward.

“A glassful of good new milk,” says Carodoc Granhim, “should accompany porridge; but the milk should not be poured on the warm porridge. The cold milk soddens the porridge, and the hot porridge impairs the flavor of the milk by making it neither hot nor cold. But a spoonful of hot porridge, dipped into the fresh cold milk, acquires a piquancy which the palate discriminates and relishes; for one can become an epicure in porridge.”

If any be left over it may be re-cooked with next morning's portion, breaking it into the hot water before stirring in the dry meal. This second cooking rather improves it than otherwise. Cold water should never be used for preparing oatmeal porridge if it is desired to bring out its best qualities. Some add a little brown sugar and butter to the oatmeal while cooking; but while this may increase its nourishing qualities I could never see that it improved the flavor.

Oatmeal porridge is rather more difficult of digestion than wheat meal, and this has caused some physicians and others to exclaim against it. Where this is the case it is pretty good evidence that the digestive organs have lost their full power. The true remedy would be to restore their tone, and also at the same time to pay the strictest attention to mastication, so as to bring a large amount of saliva into it to act on its starch.

Men may do heavy work on this food, and they

may go to their labor immediately after eating without injury, which is not the case with many foods. This was illustrated in the remarkable feat performed by the Great Western Railway Company in the summer of 1872. The rails of 500 miles of the road were changed from the broad to the narrow gauge in two week's time. They were held down by nuts and bolts, and these had to be unscrewed and replaced after moving the heavy rails two feet. About 3,000 men were employed, and they worked from four in the morning till nine at night. To generate sufficient force, in addition to the bread, cheese, cocoa and bacon a pound and a half of oatmeal was served to each man daily. It was sprinkled with sugar, well cooked into a thin gruel in pots on stones close to their work, and taken as food and drink combined whenever they were thirsty. The men liked it exceedingly; no beer or alcohol was allowed. The work was finished within the prescribed time, and not one man became sick or drunk.

OATMEAL GRUEL AND MILK.

Oatmeal gruel made from fine oat flour is a very strengthening food, often tolerated by the weakest stomach which will bear nothing else. Oatmeal milk is a healthful and nourishing drink made as follows: Put into a goblet or bowl a tablespoonful of oatmeal and a teaspoonful of sugar. Fill the bowl with boiling water, and stir it thoroughly till all the meal is dissolved that will. Then pour off the fluid part and drink hot or cold as is preferred. Oatmeal has certain stimulating qualities which are

very remarkable. These are extracted and used as medicines by physicians.

BARLEY.

Barley is not much used for food, though pearl barley forms a constituent of many soups and broths, and barley flour makes a very digestible gruel for invalids. It is greatly improved in its taste for gruel by adding twenty-five per cent. of fresh finely-ground oatmeal flour.

Its composition is as follows :

Water	15.06
Digestible nitrogenous substances	9.79
Indigestible " "	1.96
Fat	1.71
Carbohydrates	70.90
Woody Fiber . . . . .	.11
Mineral matter . . . . .	.47
	<hr/>
	100.00

RYE.

Rye forms an important article of food in many European countries, and in early times was much used in New England, but its place has been largely taken by other grains. It is less nutritious and less palatable than wheat, has a darker color, and a slightly acid taste. On account of its somewhat laxative action it has considerable value in counteracting obstinate constipation. The following is the best method of preparing it for this purpose: Clean your rye in fresh water, dry it, grind it coarsely in a coffee mill; wet up into a moderately stiff dough and roll out into a thin sheet, cut up into thin cakes and bake hard in a hot oven. One or two of

these cakes broken into a teacup of boiling water and taken before breakfast is an almost infallible remedy for constipation. These dry cakes will keep a long time in a cool, dry place.

It is subject to a disease known as "spurred rye," the kernel of which is of a dark brown color, developed enormously beyond the husk. This spurred rye is a dangerous poison, sometimes causing death.

Its composition, as given by leading authorities, is as follows :

Nitrogenous matter	8.0
Carbohydrates	73.2
Fatty matter	2.0
Saline matter	1.8
Water	15.0
	<hr/>
	100.00

Composition of dried rye :

Nitrogenous matter	12.50
Starch	64.65
Dextrine, etc.	14.90
Fatty matter	2.25
Cellulose	3.10
Mineral matter	2.60
	<hr/>
	100.00

INDIAN CORN.

Indian corn is indigenous to America, and constituted an important article of food for the Indians before Columbus found his way here. It is also cultivated in Southern Europe and Africa. Like wheat it has an external woody layer for protection, below which is a layer of gluten cells, and

under these the starch cells, which are of peculiar shape, being smaller than the starch cells of wheat and many-sided. Corn is quite extensively used as food in Mexico, in the Southern United States and to a considerable extent in the Northern States. It is very largely exported to Europe, and is, fortunately, partially taking the place of the potato in Ireland.

Its greatest use, however, is for feeding cattle and horses, and for fattening pigs. Under the most favorable conditions it takes three pounds six ounces of shelled corn to make a pound of pork. To accomplish this the hog must be kept quiet, clean, warm and comfortable. Corn fed in the ear makes on an average nine pounds of pork to one bushel of ears. If the ears are ground, cob and all, and fed uncooked, a bushel will make twelve pounds of pork. If the corn be ground and cooked, a bushel will make fifteen pounds of pork.

By comparing the chemical constituents of one pound of pork with three pounds six ounces of shelled corn, it will hardly need the aid of a chemist to show that corn, as a food for man, besides being cheaper, contains much more nourishment, and consequently there is great waste in feeding it to pigs to change it into food.

Corn is rich in oil and in starch, but less rich in nitrogenous matter than wheat or oats. There are very many varieties, all differing in chemical composition, and especially in the amount of oil, which sometimes falls as low as three per cent., and sometimes rises as high as nine per cent. The oil of corn differs from animal oil in containing fatty acids.

Its average composition is given by Blythe in the following table :

Water	17.10
Nutritive nitrogenous matter	10.91
Non-nutritive nitrogenous matter	1.89
Oil or Fat	7.00
Carbohydrates : Dextrine and Sugar, 1.5 ; } Starch, 59.0 }	60.50
Mineral matter	1.10
Cellulose	1.50
	<hr/>
	100.00

RICE.

Rice forms a chief article of food for about one-third of the human race, especially for those living in warm climates, for whom it is well adapted. It is extensively grown in some of the Southern States, and that produced in South Carolina is equal, if not superior, to any in the world. Its chief constituent is starch; it contains almost no fat and but a comparatively small amount of nitrogenous substance.

The starch of rice is very superior in quality, and very easily digested, owing, perhaps, to the fact that the amount of woody matter around the cells is very small. Its deficiency in nitrogenous matter and oil renders it defective as a chief article of diet. It is possible that the small stature of many Hindus, who live largely upon rice, is owing partly to its lack in tissue-building material. It is well suited to invalids needing hydrocarbons and to the old, who require easily-digested foods, also as an adjunct to other foods it has value. Its whiteness when properly boiled makes it very beautiful.

The following is its composition (Blythe):

Water	14.41
Nitrogenous substances	6.94
Fat . . . . .	.51
Starch	77.61
Woody Fiber . . . . .	.08
Ash . . . . .	.45
	<hr/>
	100.00

BEST METHOD OF PREPARING RICE.

Rice may be prepared in many ways, but I regard the following as the best:

1.—Boil it carefully, so not to break up the kernels, and eat with cream and sugar or milk, or with fruits in their season. In this form it is quickly digested.

2.—The most satisfactory pudding from it is made as follows: Take two teacups of rice, five quarts of milk and one cup of sugar; stir them together in a pan and bake slowly for two or three hours. This will furnish sufficient for dessert for twenty persons, and is equally good, if not better, when it is cold.

BUCKWHEAT.

Buckwheat is highly nutritious and wholesome when properly prepared. Its composition is as follows:

Nitrogenous matter	13.10
Starch, etc.	64.90
Fatty matter	3.00
Cellulose	3.50
Mineral matter	2.50
Water	13.00
	<hr/>
	100.00

PEAS, BEANS AND LENTILS.

The bean is a very important food, and it is destined to become much more extensively used than even now. There are many varieties, as there are of wheat and corn, with slight difference in their chemical constituents.

The special characteristic of the bean, as compared with cereals, is a less amount of starch and a larger amount of nitrogenous matter. This renders it an excellent substitute for flesh meat. All experience goes to show that it is a more satisfying vegetable product for hard-working men than almost any other. In Catholic countries, especially France, where flesh food is less used, and where during Lent and on Fridays it is proscribed, leguminous products are more extensively used than elsewhere. They are much used by the vegetarians of India and China, and in some of the provinces, especially in those parts where the people have the strongest and best developed bodies.

In Japan the bean is made into a curd, a most nutritious article of diet, and the nearest approach in its chemical constituents to animal food of any of the vegetable foods. A very full account of the mode of preparing and using it was published by the United States Government in the consular reports for 1886. This curd is used in soup, croquetts and a hundred other ways, and is said to be well liked. It might to our advantage be introduced into our country, and so might the soy bean generally used in Japan and China, which is richer in fat than our own beans are. Its composition is given by Prof. Koch in his paper on "The Agricultural Chemistry of Japan," as follows:

Water	11.32
Mineral matter	3.86
Fat	20.89
Albuminoids	37.75
Wood Fibre	2.00
Starch	24.08
Loss . . . . .	.10
	100.00

The bean is more difficult of digestion than other vegetable products, and this is, perhaps, one reason why persons with weak powers of digestion are unable to use them. If, however, they be properly prepared, thoroughly masticated, and instead of being eaten in large quantities once or twice a week are eaten in small amounts daily we should have less complaint of their indigestibility. Beans are more digestible when vinegar or some acid is added to them.

Blythe, in his little work, "Diet in Relation to Health and Work," says: "To utilize the leguminous foods to the best advantage, they require to be finely ground into meal and to be thoroughly cooked. An experiment by A. Strümpell bears on this. Leguminous meal was made into cakes, with suitable mixtures of eggs, butter and milk, and eaten, and compared with the result of eating the same substance without grinding, but first soaking in water and then boiling. In the first case 91.8 per cent. of the nitrogen was absorbed; but in the second only 59.8, so that nearly one-half of the 'vegetable meat' was wasted."

COMPOSITION OF BEANS, ETC.

Composition of Beans, Peas and Lentils, in parts of 100 (Blythe).

	PEAS.		BROAD BEANS.		KIDNEY BEANS.		LENTILS.	
	Per cent.	Per lb. Ozs.	Per cent.	Per lb. Ozs.	Per cent.	Per lb. Ozs.	Per cent.	Per lb. Ozs.
Water	14.31	2.3	14.84	2.4	13.60	2.2	12.51	2.0
Nutritive Nitrogenous Substances	19.98	3.2	21.30	3.4	20.81	3.3	22.31	3.6
Non-nutritive Nitrogenous Substances	2.65	.4	2.36	.4	2.31	.4	2.50	.4
Fat	1.72	.3	1.63	.2	2.28	.3	1.85	.3
Carbohydrates	53.24	8.5	49.25	7.9	53.63	8.6	54.78	8.7
Woody Fibre	5.45	.9	7.47	1.2	3.84	.6	3.58	.6
Ash	2.65	.4	3.15	.5	3.53	.6	2.47	.4
	100.00	16.0	100.00	16.0	100.00	16.0	100.00	16.0

THE POTATO.

The potato was introduced into England from America about the year 1585. The three hundredth anniversary of its introduction was celebrated in England in 1885 by an exhibition, and by many interesting papers on the history of this vegetable. It is somewhat uncertain to whom its introduction was due, although Raleigh has received the most credit for it. For nearly two hundred years it was not much prized, and it is hardly over one hundred years since its use became general throughout Europe and America.

The potato is composed, aside from nearly 76 per cent. of water, mainly of starch; and, indeed, as the source of the carbohydrates it furnishes an abundant supply at a very low cost. Its great deficiency is fat and nitrogenous substances. A portion of its nitrogen exists in the form of solanine, which is very poisonous; but as this is mainly in the peeling, it rarely causes any injury. Solanine is quickly destroyed by heat in baking the potato, and this is, perhaps, one reason why baked potatoes are more wholesome for invalids and those with weak powers of digestion. The poison is, no doubt, also extracted into the water by the process of boiling.

Potatoes should be thoroughly masticated in order to bring them under the influence of the saliva for their most perfect digestion, as the gastric juice of the stomach would have little or no influence upon them. Indeed, if accepted theories of digesting be correct, not much of the potato is digested in the stomach. With some fatty and oily food, and brown bread and beans, a cheap diet might be prepared, capable of supporting life and bodily vigor indefinitely.

Potatoes require great care in cooking, so they will be mealy, and not sodden. In the latter condition they are neither wholesome nor agreeable.

The composition of the uncooked potato according to the mean of 70 analyses is as follows :

Water	75.77
Nutritive nitrogenous substances . . . . .	.84
Non-nutritive " " . . . . .	.95
Fatty matter . . . . .	.16
Starch	20.56
Woody Fiber . . . . .	.75
Ash . . . . .	.97
	<hr/>
	100.00

THE SWEET POTATO.

Another delicious tuber is the sweet potato. It is said to be indigenous in the Malagan Archipelago, growing wild in the woods. It requires a warmer climate, and a warmer soil, than the common potato, and more care in raising. It is cultivated in the south of Europe, in India, and in America; but, since the introduction of the Irish potato, its use in Europe is somewhat less. Its composition differs considerably from the common potato, and it is a little more expensive article of diet.

Its composition, according to Payan, is as follows:

Nitrogenous matter	1.50
Starch	16.05
Sugar	10.20
Cellulose . . . . .	.45
Fatty matter . . . . .	.30
Other organic matter	1.10
Mineral salts	2.60
Water	67.80
	<hr/>
	100.00

THE ONION.

The onion is used extensively throughout the civilized world, and is very nutritious. Those grown in northern climates are stronger and less delicate than those grown in warm latitudes.

In Spain and Portugal the raw onion, with bread, often forms a dinner for the working man. The peculiar taste of the onion is, in a large part, due to an acrid, volatile, sulphurous oil, much of which is dissipated by boiling.

Onions sliced into beans, peas or lentils and boiled with them improve the flavor of the latter, and strange to say, entirely lose their odor and power to taint the breath.

Its average composition is (Blythe) :

Water	64.66
Nitrogenous matter	6.76
Fat	0.66
Nitrogen free, extractive matter	26.31
Woody Fiber . . . . .	.77
Mineral matter	1.44
	100.00

OTHER ROOTS.

The carrot, parsnip, turnip, beet and radish have little nutritive value, being mostly water. They cannot be said to be important articles of diet, but for change and variety they have some value. They are also useful in making vegetable soups.

THE CABBAGE.

The cabbage tribe is large, including as it does cauliflower, broccoli, Kohl-rabi and some others.

They contain about 90 per cent. of water, and consequently little nourishment. When fresh, crisp and tender they have a delicate, almost delicious taste, and for those who live upon highly concentrated food they must be useful.

SPINACH.

The leaves of the spinach are tender, especially in the spring of the year. They furnish an early fresh vegetable, which may be considered very wholesome, more particularly for those who suffer from constipation. Like cabbage, it contains about 90 per cent. of water.

RHUBARB.

This vegetable is said to be a relative of the buckwheat tribe. It furnishes much acid, similar to fruit acids, and is useful as an early vegetable.

CELERY.

The use of celery is extending rapidly, and when properly grown furnishes a delicious relish and considerable nutriment. It has some reputation as an antidote for rheumatism; but other appetizing fruits are, no doubt, equally useful. It has also a reputation for promoting sleep.

ASPARAGUS.

The young and tender shoots or the asparagus furnish an early and an appetizing food, with only a small amount of nutriment. It is a diuretic, and contains over 93 per cent. of water.

LETTUCE.

Lettuce has been cultivated and eaten from time immemorial. The head of the lettuce, when crisp and tender, makes a digestible and wholesome salad. I once had a patient who seemed to object to every form of food I offered. I said, "Is there anything you can eat?" and the reply was, "I crave lettuce." I brought a large plate of the tenderest lettuce I could find in the market, with proper dressing, and told my patient to eat all the appetite called for; she did so with a most excellent result. Good, fresh, tender lettuce contains about 95 per cent. of water.

CRESS.

The young leaves of the garden cress make an agreeable and healthful salad, much esteemed. Watercress, a creeping plant which grows in slowly-running cold spring water, is an appetizing and wholesome plant, somewhat pungent to the taste, but containing little nutriment.

CHAPTER X.

FRUITS.

Writers on dietetics do not rank fruits as highly as they deserve, because they are guided by the chemist, who finds much less solid matter in them than in the grains. From this standpoint they do rank low; but their value is not to be estimated in this way. They possess precious qualities and virtues not yet known to chemistry. Their juices, distilled in Nature's laboratory, need no boiling or filtering, and never convey the germs of disease. How easily they go through tissues of the body, leaving their precious salts of potash, soda, phosphorus, or whatever they may be, taking up the broken-down debris of the system and carrying it off! Their acids, how refreshing; their salts, how stimulating; their delicious flavors, how they play on the nervous system! They clog not, neither do they cloy. A physician writes to me on this subject, saying:

“There is scarcely a disease to which the human family is heir but the sufferings therefrom would be greatly relieved or entirely prevented by the use of fruits, which are now so generally forbidden. Many diseases would be conducted to a safe termination by the free use of fruits, because of the

acids they contain. When our troops were fighting the Seminoles in Florida, many were sick with diarrhea and dysentery, and cured these disorders by stealing from the hospitals into the fields and eating fruits, blackberries especially. I have sent several children suffering with cholera infantum and with dysentery to the peach orchards of Delaware, with most gratifying results; and where they could not be carried to the orchards to pick and eat the fruit fresh from the trees, I have had the little sufferers fed with sound fruit with equally good results.

“In typhoid fever, in the treatment of which such extraordinary care is enjoined as regards diet, fruits are not only often highly grateful to the patient, but work most favorable results. A physician who had been sick some weeks with this disease, says his diarrhea was cured by peaches. ‘I ate the half of a large peach,’ said he, ‘and feeling no ill effects I ate the other half, then one or two more, and the next day as many as I desired. My bowels got better at once, and my recovery was rapid.’

“A typhoid fever patient, who had been about three weeks sick, and though imploring, was allowed no diet but beef tea or milk punch, came under my care for a few days. I immediately ordered a free use of peaches and grapes, and the diarrhea at once ceased, and at the end of five days, when I relinquished the care of her, she was convalescent. My impression is, the disease runs a shorter and more favorable course under the free use of fruits than under the usual method of treatment, and I think the use of stimulants is rarely required when fruits are freely given.

“In the treatment of scarlet fever and diphtheria our summer fruits and many of the vegetables are most useful, and to the best may be added some, or, in fact, any foreign fruit. There is scarcely a disease accompanied with fever but grapes and bananas may be freely given to the patient. In the treatment of dysentery I would very much prefer ripe, sound fruits, peaches especially, to any medicine that can be suggested.”

THE APPLE.

The apple is the prince of fruits, and can in our climate be preserved so as to continue during the entire year. My friend Joel Benton has permitted me to quote from his classic essay on this fruit :

“As iron is rated among the metals, so the apple ranks among fruits. It is not the most luxurious or the most luscious for the moment, but it is the most durably valuable, the most practical. All languages make room for its name, and being always planted near the house, it equals the dog in its notoriety for human companionship. As the word *book* is appropriated as the chief book of all, so *apple* sometimes stands for fruit in general. Scripture and geology, which have been supposed to differ about some things, agree as to its age, both placing its birth just a little before man's, as if it were said, ‘Now the apple is born, it is time for man to be, who is destined to eat.’

“Curiously enough, the apple has a very pertinent relation to the brain, stimulating its life and its activity, which it does by its immense endowment of phosphorus, in which element it is said to be richer than anything else in the vegetable kingdom.

But phosphorus is not only brain-supporting; it is *light-bringing*, and must thus contribute to knowledge.

“The apple follows the belt of civilization, the zone of intellect, or else is followed by it. It is, at any rate, correlative, and we may well say :

‘Where thou art is clime for me.’

“The celebrity of this fruit not only goes through the mythologies, but mention is made of it in the Old Testament in about ten places. Solomon says in his Song, ‘As the apple tree among the trees of the wood, so is my beloved among the sons.’ And, in another place, ‘Stay me with flagons, comfort me with apples.’ ‘A word fitly spoken,’ says the proverb, ‘is like apples of gold in pictures of silver.’ Loki, who was the great thief and mischief maker among the Northern divinities, stole Iduna’s apples, and the Grecian writers report a similar freebooting of Mercury, which gives the schoolboy his eminent example. Mr. John Burroughs says, ‘The boy is indeed the true apple-eater, and is not to be questioned how he came by the fruit with which his pockets are filled.’ He will even eat with relish that puckery atrocity, the unripe green apple, the windfall of July, the very embodiment of vegetable total depravity.

“We are told that in Arabia the apple ‘is believed to charm away disease, and produce health and prosperity. In some countries the custom remains of placing a rosy apple in the hand of the dead, that they may find it when they enter Paradise.’

“Mr. Thoreau says that ‘apples made a part of the food of that unknown primitive people whose

traces have been found at the bottom of the Swiss lake, supposed to be older than the foundation of Rome; so old that they had no metallic implements.

Cowley makes his muse give thanks to him who restores or improves the apple :

‘He bids the ill-natured crab produce
The gentle apple’s loving juice,
The golden fruit that worthy is
Of Galatea’s purple kiss.’

“It may be safely said that, except the various kinds of grain, there is no product of the earth in this country which is so good for food as the apple. This noble fruit is no mere palate-pleaser; it is very nutritious. Not only is it more nourishing than the potato, but it contains acids mild and gentle, as well as pleasing to the taste, which act in a beneficent manner upon the whole animal economy. An apple-eater is very rarely either dyspeptic or bilious.”

“An English writer says: ‘It will beggar a doctor to live where orchards thrive.’ Mr. Burroughs offers statistics showing that certain operatives in Cornwall, England, in a time of scarcity found apples in some manner a substitute for meat. They could work on baked apples without meat, when a potato diet was not sufficient. To its healthfulness he bears witness: ‘Especially to those whose soil of life is inclined to be a little clayey and heavy is the apple a winter necessity. It is the natural antidote to most of the ills the flesh is heir to. Full of vegetable acids and aromatic qualities which act as refrigerants and antiseptics, what an enemy it is to jaundice, indigestion, torpidity of liver, etc.! It is a gentle spur and tonic to the whole biliary system.’

“The individual fruit in his hands he describes ecstatically: ‘How pleasing to the touch! I love to stroke its polished roundure with my hand, to carry it in my pocket in my tramp over the winter hills, or through the early spring woods. You are company, you red-cheeked spitz, or you salmon-fleshed greening! I toy with you, press your face to mine, toss you in the air, roll you on the ground, see you shine out where you lie amid the moss, the dry leaves and sticks. You are so alive! You glow like a ruddy flower! You look so animated, I almost expect to see you move! I postpone the eating of you, you are so beautiful! How compact! How exquisitely tinted! Stained by the sun, and varnished against the rains! An independent vegetable existence, alive and vascular as my own flesh, capable of being wounded, bleeding, wasting away, or almost repairing damages!’

“Mr. Alcott, whom Carlyle could never pardon for his vegetarianism, was an equal eulogist of this fruit. He says: ‘Apples are general favorites. Every eye covets, every hand reaches to them. It is a noble fruit; the friend of immortality, its virtues blush to be tasted. Every muse delights in it, as its mythology shows, from the gardens of the Hesperides to the orchard of Plato. A basket of pearmains, golden russets, or any of the choice kinds, standing in sight, shall perfume the scholar’s composition as it refreshes his genius.’

“For a filip to the best social feeling and the wittiest conversation we wait till the apples appear. How well they brighten up the dull winter evening when they go round! Whittier, in speaking of old times in the country, says:

‘And for the winter fireside meet,
Between the andiron’s straggling feet,
The mug of cider simmered slow,
The apples sputtered in a row,
And close at hand the basket stood,
With nuts from brown October’s wood.’

“Strangely stimulating is this fruit! The activity it gives to the blood is fairly contagious. I suspect a good many of the shrewd sayings of our wise forefathers, which survive orally in every neighborhood, owe their spur and sparkle to the juicy apple. I have a young lady friend who always beats at a favorite game after the apples appear, though before they arrive I am occasionally the victor.

“Mr. Thoreau is fantastic enough to think that the man who deals with apples should be of a solid and robust quality, for he says, ‘When I see a particularly mean man carrying them to market, I seem to see a contest going on between him and his horses on one side, and the apples on the other, and, to my mind, the apples always gain it.’

“There are some apple-eaters—men more particularly—who can apparently eat just as many apples after a meal as if no meal had been served. I recall a laboring man, who ate six large ones after a hearty dinner, and went his way as if nothing notable had happened. This was twenty-five years ago, and he still lives, and is destined to live, perhaps, as long as will the tree that bore them. They were eaten raw, as the epicure of this fruit tells you they always should be, and the second orthodox rule is, to ‘dispense with the knife.’ Any one, however, who is not anxious to have them as good as they can be, will do the next best thing in following this recipe, which I will venture to vouch for: Buy a

small tin apple-corer; core with it as many apples as you want, without peeling them; set them on a porcelain dish; place this in a hot oven, having first filled up the vacancies left by your surgery with the best of sugar. Let them bake till they are well done. Take them out, and if you do not know what to do next, call in your nearest and best friend for further advice."

It would be useless to try to give chemical analyses of the average composition of apples, they vary so. They contain from 81 to 85 per cent. of water; from 6 to 10 per cent., or more, of sugar; from $\frac{1}{2}$ of 1 per cent to 1 per cent. of free acid; from 3 to 8 per cent. of albuminous substances, and less than $\frac{1}{2}$ of 1 per cent. of salts.

This noble fruit may be served in a great variety of ways, or, best of all, may be eaten raw. For the latter way the finest, juiciest, most appetizing ones should be chosen—those which have a spicy taste and refresh almost from the moment they enter the mouth. As a part of the breakfast, delicious apples often put one in good humor for the entire day. At least for this meal they might, with brown bread and perhaps a glass of milk or a cup of chocolate, for moderate workers form almost the entire meal.

In cooking apples, it should be borne in mind that heat often brings out of poor fruit fine qualities; so that varieties not suitable for eating uncooked frequently make the best pies and sauce.

GRAPES.

I rank grapes next to apples in value and in healthfulness. Originally cultivated between the 20th and 40th degrees of north latitude, and only

then successfully where soil and climate were most favorable, they are to-day, through a better agriculture, grown much more extensively and farther north and south. As an article of food the grape has always been highly prized, and its unfermented juice makes a nourishing drink. The ancient Greeks and Romans boiled the grape juice to one-half or one-third its bulk and drank it. In Germany, Italy and France to-day, during the vintage much grape juice is drunk, and in many places the juice is boiled to a syrup and used in various food preparations.

The constituents of the grape vary with the variety, the soil, the climate and state of the weather.

1.—An important part of the grape is its sugar, which may be as high as 30 per cent. or as low as 10 per cent. The warmer and drier the weather at the time of ripening the more sugar in the grape, and the less acid it is found to contain.

2.—No grape is entirely devoid of the acid called vinous acid, similar to the malic acid of the apple.

3.—There is a small quantity of albuminous matter in the grape, similar to the albumen in the blood, also some gum and dextrine.

4.—The mineral constituents are, tartarate of potash, soda, phosphoric acid, lime, magnesia and iron, with a few other unimportant minerals.

4.—The coloring matter is slight; but some grapes contain considerable tannin and fatty oils.

6.—From 70 to 80 per cent. of the grape is water.

THE NUTRITIVE VALUE OF THE GRAPE.

Grapes are nourishing, but their nourishing properties are not the same as those of bread and meat,

for they contain only a small proportion of the protein which is required daily. For instance, it would take over one pound of grapes to give as much albumen as is found in a single egg. But as protein is so abundant in our grains we do not need it in our fruits, and this is a wise provision of Nature. In non-nitrogenous substances, in acids, in mineral matter, in pure water and refreshing qualities consists the great value of the grape.

THEIR PHYSIOLOGICAL EFFECTS.

The physiological effects of the grape are significant. Eaten with other suitable food, and especially with bread in quantities of from one to two pounds daily they increase nutrition, promote secretion and excretion, improve the action of the liver, kidneys and bowels, and add to the health. The sugar of the grape requires no digestion, but is taken almost at once into the blood, where it renders up its force as is required; so, also, of the water.

The dextrine of the grape promotes the secretion of pepsine, and this favors digestion. Sometimes when grapes are taken too freely the heart may be excited by the potash salts, but this need not occur. The phosphoric acid, of which there is considerable, acts most favorable on all the bodily functions, and especially on the brain. Grapes richest in phosphoric acid are best. Preuss found wine rich in phosphoric acid most favorable to the recovery of children ill with many diseases, and in order to discover if these effects were in any respects due to the alcohol, he removed it by evaporation and found the results quite as striking. He also showed that the tartarate of potash in the wine rendered the

blood more alkaline, which he deemed to be a benefit in some diseases. Grapes have been found excellent in cases of diarrhea, a result possibly due to the tannin, but it cannot be entirely owing to this substance.

THE GRAPE CURE.

Grapes, say several authorities, act very much like mineral waters on the system; but they must be more beneficial than mineral water because they nourish, and their effect on the nervous is greater through their more agreeable taste. Eaten moderately with a suitable diet they will not produce cathartic effects, but a more natural action of the bowels, so important to health, or if eaten in larger quantities, they are gently laxative. As soon as this occurs obstructions disappear, and a feeling of comfort arises which is very gratifying to the sufferer.

“At present,” says Dr. Knauthe, “the grape is used in diseases of the most varied character, mostly, indeed, upon the ground of present experience, as also upon that of its ancient reputation. It is chiefly celebrated and effective in the treatment of affections of the digestive organs, namely, catarrh of the stomach, with or without intestinal catarrh, heart affections and dyspepsia, which without pain are accompanied by a feeling of pressure and fullness, and which are followed as a consequence by loss of appetite, sluggish movements of the bowels, sour eructations and heartburn, in habitual costiveness; also in affections resulting from alcoholism. It is successful in all diseases where a cleansing of the intestinal canal is requisite, as in hemmor-

rhoids or the so-called abdominal plethora, in congestion of the brain, in the most varied affections of the liver which cause an enlargement of this organ, in chronic jaundice, in pleuritic exudations, suppressed menstruation. And further, the grape cure acts favorable in chronic bronchial catarrh, scrofula, lung complaints, asthma, enlargement of the spleen, intermittent fever, cachexie, chronic affections of the urinary system, with their various consequences, in chlorosis, (on account of the iron of the grape). Curchard and Huber observed improvement in chronic diarrhea. Tscharner regarded the grape cure as effectual in diarrhea originating from nervous excitement of the intestines, as also in nervous coughing. Schirmer observed favorable effects in chronic catarrh of the areolar tissue, and Schulze and Curchod recommended the grape cure in affections of the skin, as freckles and scurvy, while Liebenstein affirms that he has cured the itch by its use. It is recommended also in gravel, diabetes and Bright's disease of the kidneys. Its action is especially favorable for the corpulent, for the gluttonous and high livers.

“The more or less favorable results in these complaints are to be attributed to the important fact of the cleansing action of the grape, and there can be no doubt that this treatment, on account of its easy application, is to be preferred to other methods of cleansing, especially since it is in the power of the physician to give prominence to the nourishing, or rather to the not weakening, side of the treatment, and thus to adapt it to the constitutional requirements of the patient.

“Great virtue has been ascribed to the grape cure

in cases of tuberculosis and consumption of the lungs, and the different grape cure physicians have each peculiar views concerning it, and make great and small distinctions concerning its efficiency in different complaints, each according to his own experience and according to the standpoint from which each regards the question of tuberculosis, etc. One will apply the grape cure only in chronic pneumonia and phthisis where the intestinal canal is healthy; another will find it indicated only in certain periods of phthisis; still others think it indicated only in phthisical tendencies, but especially says Weber: "The grape cure is most suitable for persons who are not reduced in flesh, and who suffer from no irritating conditions of the vascular system. Sweet grapes rarely cause diarrhea. When tuberculous persons are very lean, poor in blood and feverish, the grape cure is not suitable, though they may use grapes as part of their diet. For such patients foods rich in albumen are to be preferred. The treatment which is understood by the term grape cure, that is the eating of five to eight pounds of grapes in the course of each day, whereby an irritation of the intestinal canal and a softer or thinner stool is caused, is in chronic tuberculosis and phthisis under all circumstances injurious, as is shown by the physiological and anatomical conditions in tuberculosis and phthisis. The first and most important task in this disease consists in the avoidance of violent action upon the body and in securing to it the necessary fresh air and rest. All permanently exciting action upon the intestinal canal, even when it is healthy, is especially irrational, as is plain when we consider the liability.

of such patients to follicular inflammation of the mucous membrane of the intestines, and that this may be induced at any time by very slight causes, and when caused that the tendency to accumulate caseous products in the system may have the most dangerous consequences. A good digestion and a sound stomach and intestines are in consumption of the lungs the most important factors in securing a tolerable existence.

“A regular use of from one to two pounds of grapes daily, together with a nutritious diet, is very beneficial to a healthy stomach and intestines, since here the fat-building, nourishing effects of the grape are manifest; but, strange to say, this form of grape eating is not reckoned as a grape cure by those who insist that there should be some certain number of evacuations daily; and yet there is no doubt that this method of grape eating may properly be called a grape cure, that is, for example, when during five or six weeks there are eaten daily from one to two, or even three pounds of grapes. Their favorable action is certain if accompanied by regular exercise and a suitable diet.

“Paul Niemeyer (“*Atmiatrie* p. 174) utters the truth when he says, “Modern society possesses too little power of abstraction to pursue a mere course of breathing gymnastics with daily renewed zeal. Devotion comes first when the effort is a means to an end, namely, to the consumption and digestion of whey, grapes, vegetable juices, and the like.

METHODS OF THE GRAPE CURE.

“By the grape cure is understood the daily, and for weeks, continued eating of grapes, with the

observance, at the same time, of a prescribed diet. Some are disposed to regard that only as grape cure in which at least three pounds are eaten daily, but upon what ground is not plain. The action of the grapes upon the system is controlled by the kind of diet and by the quantity of grapes eaten as determined by the symptoms in each case and by the constitution of the patient. In accordance with this, the prescribed diet is either liberal or restricted. Usually the amount of grapes eaten varies between three and eight pounds daily.

“In eating the grapes, the following conditions must be observed: The fruit should be completely ripe, and should be washed before being eaten in order that impurities and insects may not be taken with them. The grapes must be fresh from the vine, or, as some prefer, may first lie a few hours in order to avoid the injurious effects of their coldness, which, with sensitive persons, causes a disagreeable sensation in the mouth and in the teeth, and also injures the stomach and intestines, and may produce violent diarrhea. Eating fresh from the vine in the vineyard itself is, therefore, only exceptionally to be permitted during the heat of the day. The grapes should not be bitten with the teeth, but pressed with the tongue against the roof of the mouth, by which the blunting of the teeth is lessened. The skins and seeds should not be swallowed. The cure is begun by eating a small quantity of grapes, usually one to two pounds each day, increased by half a pound daily until the desired quantity is reached. The cure should not be suddenly interrupted, but the quantity eaten gradually diminished daily. To those who have an aversion to

grapes on account of the disagreeable feeling which they cause in the teeth and in the mucous membrane of the mouth I would give the freshly-pressed juice. There are small presses for this purpose which the patient himself may use to express the juice for each day's consumption. The objection sometimes made to this expressed juice, namely, that it may ferment before being drunk and thus cause much injury is not valid, since the time that intervenes between the pressing and drinking is not sufficient to admit of any change in the *must*. The fermentation may be wholly prevented for a length of time by closing up the juice securely in bottles. A hermetical sealing of the bottles cannot, however, prevent fermentation, since the cause of fermentation, the germs, enter during the preparation, and cannot be excluded by the subsequent sealing. The juice enclosed in bottles may indeed keep longer than that exposed to the air, but certainly not for any great length of time. According to Neubauer the juice keeps for years good and pure when well filtered, put into bottles well closed up, and then the germs made incapable of development by heating the filled bottles one quarter of an hour in a kettle of boiling water. He also says that he has kept it thus treated in his cellar for a length of time, that it may be distinguished in appearance and flavor from that which is fresh, and that it may be used for the purposes of the grape cure at any season of the year.

“Juice not containing sufficient sugar was preserved by the ancients. It was conducted from the press into a cistern and then filled into an *amphora* (a kind of jug holding several gallons), and in these

vessels sunk in a pond of water until winter. The juice by this time lost all tendency to fermentation, so that it remained fresh a whole year or longer. This was regarded as intermediate between syrup and wine, and by the Greeks was called *everlasting must*.

“We return now to the subject of the cure. The grapes to be eaten each day are divided into three portions. Exercise in the open air is necessary during the act of eating. The first portion is eaten before breakfast, fasting, between seven and eight o'clock, though patients who cannot bear this may first eat their usual breakfast and an hour afterward take the first portion of grapes. It may also in some cases be necessary to allow no grapes at this time, or to allow some bread crust to be eaten with them. When the grapes are eaten fasting the breakfast may be eaten an hour later, and should, of course, be light. It may consist of bread, tea, thin chocolate or light soup. The second portion of grapes is taken in the forenoon, at least an hour before dinner; the third portion in the afternoon, between three and five o'clock, but always from one to two hours after dinner. Some physicians allow a fourth portion after supper (Schulze).”

The season of the cure falls within that of the ripening of the grapes, which varies according to the location of the grape cure, as southerly or northerly, and between the middle of August and the middle of October.

The grape cure should be interrupted during menstruation and in cases of hemmorhoidal bleeding, and it is also inadmissable during pregnancy and nursing.

With regard to the diet, the following articles are prohibited, viz.: all heavy foods, foods cooked in fat or butter, all foods causing flatulence, potatoes, roots, kohl-rabi, etc.; heavy black bread, milk, beer, fat, heavy fish, pickled flesh, heavy farinaceous foods, hard eggs and cheese. Permitted are bread, butter, milk, thin chocolate, and fruits in limited quantities. The protection of the teeth requires their being cleansed daily with some powder which will neutralize the acid of the fruit.

Stomatitis and other unfavorable conditions, as vomiting, diarrhea and colic are treated with the usual remedies. Costiveness occurring in the beginning of the cure is relieved by a glass of bitter water, or by eating a few figs.

CHOICE OF GRAPES.

We have here to do especially with those best for eating. Regarding these the following are the chief requirements: 1. That the berry should not be too small; 2. That the skins should be thin; 3. That the seeds should be thin and small; 4. That they should possess a sweet and agreeably aromatic taste; 5. That the juice should not be too watery, but should have a good body, and the berry should be somewhat fleshy; 6. That they should have a certain consistency or hardness. According to the number and degree of these qualities table grapes are classified as very fine and tolerably good.

It is in European countries that the grape cure has been most thoroughly studied and highly developed; but there is no reason why it should not be made popular in our own country. We have a delightful autumn climate, excellent grapes, though

differing from the European ones, and many favoring conditions. In a small way it has been tried by individuals here with gratifying results.

OTHER FRUITS.

Having given so much space to apples and grapes I must pass over with only a brief mention other fruits, of which there are a great variety. The pear might be named for its fine qualities and the considerable amount of iron it contains. The peach when at its best, and fresh and alive from the tree has no equal for deliciousness, and is always a favorite with invalids. A few days spent in the peach orchards of Delaware, eating fruit and helping do some of the light work, have benefited many invalids. The cherry, with its fine acids is almost a cure for diseases of the bladder and kidneys; the blackberry, which when stewed with sugar furnishes a drink most valuable in diarrhea; the strawberry, a great luxury if sweet and fresh, a fruit that cured Wilson, the ornithologist, of a chronic malarial fever after the doctors had failed; the lemon, so full of citric acid as to form the basis of the finest drink in the world; the orange, a tonic and a medicine that rarely disagrees, the juice of half a dozen of them before breakfast or at almost any time will, by its delightful flavor and useful salts, often turn a day of gloom with one of joy. No wine can at all compare with its stimulating but not intoxicating qualities. A friend who owns an orange grove tells me he eats of them *ad libitum* during the season, and that they make a new man of him. Then there is the banana the bread of the natives of many countries, the plum, the fig, the

olive and many others I might mention if I had space, but it is unnecessary.

NUTS.

I had intended to give a chapter on nuts as foods, but want of space forbids. They abound in nourishment, but vary greatly in the amount of different substances. Several are rich in oil, which might properly be substituted for other oils. Children usually object to fat meat, but will take nuts instead. Some nuts contain considerable nitrogenous matter, as the walnut; others are rich in starch, as the chestnut. The table of analysis will show the composition of most of them.

By many, nuts are thought difficult of digestion, and this is, no doubt, because they contain so much cellulose or woody matter; but if properly masticated, and the outside skin removed, there need be no trouble from this source. Nuts contain little water, and hence if eaten in considerable quantities their digestion is facilitated by lemonade or some acid drink. Those who do not eat much fat meat or butter generally manage nuts with little difficulty.

CHAPTER XI.

FOOD FOR DIFFERENT AGES, CONDITIONS AND SEASONS.

No absolute rule can be laid down as to diet for every condition because people differ so much in their constitutions and needs ; but some suggestions based on general laws will be found useful.

DIET IN INFANCY.

It hardly needs to be said that nothing can equal the mother's milk for the child for the first six months or year of its existence. As it is drawn directly from the mother's breast it is alive, and in this living condition it must be better adapted to nourish the infant than any other food. If the mother's health is not good, or if her milk is not abundant, both can often be improved and increased by wise feeding. She should spare no effort to this end. She may herself drink as much pure milk as she can digest, or, what is quite as good, use freely thin gruels made from oatmeal, corn meal, barley and other grains, preparing them so as to be agreeable to the palate, and changing from one to the other so they shall not cloy the appetite. When the teeth come, and saliva begins to be secreted, then the mother may commence feeding the child other things ; but still milk should form the staple

article of diet up to the second or third year. In another place will be found directions for making oatmeal cream for the young child—a preparation which may be given to it, when it is three or four months old, as a partial substitute for the mother's milk if this be not sufficient. This preparation has proved exceedingly useful in many cases. A large number of substitutes for milk have been invented from farinaceous foods, many of them of very high excellence, and when necessary they may be used if more convenient. If cows' milk be used, that from a perfectly healthy cow should be procured. Goat's milk would be preferable if it could be had. Goats well fed and cared for are generally very healthy, and their milk better adapted to the growing child than that from the cow.

DIET IN CHILDHOOD AND YOUTH.

The diet in childhood and youth should be wise and judicious, for this is the period of growth and the formation of habits which will continue, perhaps, through life. Indigestible foods should be avoided. Underfeeding and improper feeding may stunt the growth of the body permanently during this age, and over-feeding, especially if stimulating foods be given, may render its growth excessive but unnatural. There should be an abundance of good breads of all sorts and rightly made, milk and fruit, and such vegetables as are suitable, farinaceous articles of every sort, including oatmeal, wheaten preparations, rice, sugar in suitable quantities and eggs to a moderate extent. The drink should be *pure* water or milk, and if any other drink is added

it should be cocoa instead of tea or coffee. The latter have no nourishment, and act too strongly on the sensitive nervous system of the child, laying the foundation of future nervous disorders. Pies, cakes and puddings are all allowable on condition that they be plainly made, otherwise not. Many of the disorders of youth arise from imperfectly prepared food.

DIET FOR WORKING MEN.

The diet for working men has been so fully discussed elsewhere that it is not necessary to enlarge or repeat here.

DIET FOR THE BRAIN-WORKER.

This need not differ from that of the well-fed working man, except in this, that his powers of digestion are somewhat less, and, consequently, he needs food rather more easy of digestion. If the brain-worker, however, would keep up his physical powers by taking abundance of exercise and air he would not suffer in this respect. For perfect work the brain should be well nourished, and each one will study the subject from the standpoint of experience and knowledge and act accordingly.

The theory has been advanced that brain-workers need more phosphorus than any other class of men, but there is no evidence as yet to justify this conclusion. "Without phosphorus no thought," says one of our German scientists. He could with equal truthfulness have said, without water no thought; without air no thought; without many other things, no thought. So far as is known, the lion, the tiger,

the dog and cat consume and excrete as much phosphorus as man, while the beaver, a most thoughtful animal, excretes, so far as has been ascertained, none. Man, however, requires phosphorus, and it is abundantly supplied in a well-selected diet.

DIET IN OLD AGE.

The old and infirm should live more like young children than adults. Milk, fruits, and especially their juices, and breads constitute the bases of a good diet for the aged. They need less than the young or those doing heavy work; they should beware of indigestible foods or of excess. Even after fifty years of age there should, in most cases, be a gradual lessening of the amount of food consumed. Excessive eating in old age keeps up too great a pressure on the enfeebled heart and weakened vessels and renders them liable to break, causing apoplexy, with its accompanying evils. It has been suggested that life may be prolonged many years by avoiding foods rich in mineral matter, and by the employment of acid drinks, especially lemonade, to dissolve and cleanse the blood and tissues of their broken-down debris. One old man whom I well knew always kept a plate of grapes on his center-table, and occasionally ate a few of them as he felt thirsty. The juice furnished a pure, slightly nourishing fluid, and he thought he was benefited thereby. He certainly lived to be nearly one hundred years old, and enjoyed for one of that age most remarkable health. Not every one can have fine grapes at all seasons, but all can have some kind of fruit-juice drink equally good.

The bread of the old should usually be made from unbolted flour, and hot bread and biscuits never used. This kind of bread keeps the bowels open without the use of purgatives, which is very important. The frequent use of purgatives is one of the habits of our time that cannot be too vigorously condemned, especially when better effects can be secured by dietetic measures.

DIET FOR TRAINING.

Trainers of men for boat racing or other athletic sports give more thought to the diet of men under their care than those at the head of our institutions of learning do to pupils seeking an education. Why is this? It is because they wish to get the most that is possible out of their bodies, to render them capable of working for all they are worth. If to compete in mere physical sports and contests it is worth while to take such care to preserve the health and choose the diet of able-bodied young men, how much more ought all to do it in order to fit themselves for the labor and struggle of daily life; how many thousands upon thousands fail and drop out of the race because they do not do this.

Some years ago I investigated the question of the diet of the students of Yale College, and found in a majority of cases it was exceedingly imperfect. No attention was given to the matter by a majority of them. They lived in boarding-houses and in other ways, and took what they could get. While they did not starve, yet compared with a young man training for a boat race their bill of fare was quite defective. Suppose at all college and university

towns the president and professors, or some one quite competent, were to arrange a practical, scientific diet and educate the caterers up to feeding the pupils as perfectly as present knowledge on this subject will permit, would not our progress be more rapid? I am sure the expense would be no greater.

A great change has taken place in the rules of diet for men undergoing training within late years. Comparing what we now have with what was once thought essential, and, indeed, indispensable, we see that the improved views which actual trials have brought to trainers are in the direction of a greater naturalness. For instance, beef, in large amounts, and almost raw, called "red rags," was formerly the diet at all meals, and scarcely anything else, and was dreaded by the men undergoing training more than any other feature in their preparatory work, even than the contest itself, pugilistic or athletic. Perhaps this was the source of a view, wide-spread still through many strata of society, that one must eat meat to "give him strength," and that the more one eats the more strength it would be sure to give him. The following points were obtained from a man who was in his younger years a pugilist, and afterward for many years a professional trainer. All are arrived at by the closest sort of trial, and that by men without a theory as such, book-learning, or any sort of medical knowledge. I repeat them in the same axiomatic way in which these men speak their knowledge, whose authority is solely that "they have tried it, and it is so."

"No one should eat meat at breakfast while in training. A small piece of fish will do; half a baked potato, well-cooked oatmeal, mush and milk,

and fruit; neither coffee nor tea. Breakfast must always be a comparatively light meal. One is to rise from table, *always*, with a not fully satisfied appetite. Over-eating in the morning, and then going an unusual time without food, is bad. The breakfast must be light, and food follows work, not precedes it, in amount at least. If a man has over-eaten, he had best eat again at the accustomed times, only very sparingly. Meanwhile, until his body is free of the surplus food he is carrying, let him go out of doors and stay, and keep up a fair amount of motion, walking leisurely about the fields, and drinking hot water when so inclined. He can then go on in his training the following day. No gain can be made while the stomach or blood is overloaded. Supper must also be a light meal, without cake or sweetmeats. Tea is allowable at supper, if made very weak. That, with a very little cold meat, a piece of toast, and cooked fruit, are enough. Sugar beyond moderate amounts is a direct detractor from strength; a pure state of the constitution cannot be attained while it is indulged in freely. Meat must be cooked done, but only in certain ways, so as to be still juicy and red in color. Rare roast, or broiled in thick slices, is best. It is to be eaten with the second meal of the day, for then the body is best able to digest and dispose of it; that is, after vigorous, protracted exercise, and before any considerable degree of fatigue is felt.

“Bread must be coarse. Trainers commonly cook bread for their men themselves, using of good wheat meal two-thirds, fresh corn meal one-third, and adding English currants. It is to be thoroughly chewed, and not eaten in excess. It is a good thing to drink

freely of hot water an hour before breakfast, and then to take a walk. It should be sipped slowly, spending twenty-five minutes on a couple of tumblersful.

“When it is necessary to empty the bowels at the beginning of a course of training, barley, boiled in water a short time till softened, and eaten or swallowed in some quantity, will give the bowels something to handle which will not compact into lumps, and which will sweep out mucus that may be present, but without causing the least irritation.

“A shower bath is the best of all morning tonics. Very vigorous rubbing should immediately succeed—first with towels, then with the palms of the hands—till the flesh is perfectly soft and pink. The strokes of both towels and hands should be downward. Rubbing the flesh under a spray of cold water will give it firmness and insensibility to blows more rapidly than any of the astringent lotions sometimes used.

“No alcohol, no beer, and especially no tobacco, are allowable. These are absolutely laid aside when training begins; the same with coffee. When a man is brought to a ‘pure’ condition, his urine has no odor, and is very light colored and clear. The sweat has a fragrant smell, ‘something like cologne.’ If a glass of ale or spirits be taken surreptitiously, a trainer will know of it on the following day from finding that his man is not as quick and true in his movements as he should be, his eye is not quite right or accurate, and when he strips his shirt off to be rubbed, after his morning’s work, the odor is ‘not like cologne, but bad.’ An astonishing amount of bruise, so long as the skin is not broken, will be



absorbed and become invisible when a man is really in "pure" condition. Illustrations were given by my informant from incidents in the professional career of Paddy Ryan and other pugilists. This absorption of a black and blue spot will take place very rapidly; perhaps twenty-four hours or a night's sleep will remove all signs of recent contusions.

"The development and the physical habits of a young man are formed before the age of twenty-five years is reached, as they can scarcely be after that age; that is, the best chance to get a well-balanced constitution comes between the ages of eighteen and twenty-five years.

"A man who has followed a trade, as a plasterer or an iron-worker—an active and care-taking trade, where all the muscles of the body are brought into play, instead of a single group—that man, if he go into training, will be a far better man to obey orders and regulations than a man who has had to use in his business only a few of his muscles. An overhead plasterer, who bends backward as much as forward, and pushes as well as lifts, is a good example. Moreover, flexors and extensors should be of equal development for another reason. If the flexor is the stronger, it acts as a strong elastic might, being not entirely under the control of the will, while the weaker opposed extensor is more or less of a lost power. Make the latter as large and strong as its opposed muscle, and the man's movements will at once become lighter and truer.

"Of my eight children, four that were raised while I was at home with them, and could enforce their having an oatmeal-and-milk breakfast and a light supper, grew up strong, and are alive now;

the other four had much their own way about food, with only their mother at home, and they all died about the time they reached puberty."

No efforts, so far as I know, have been made to arrange a fleshless diet for men under training; and so long as the general feeling of the necessity of flesh for athletes continues it will be useless, but that less and less is being used is evidence of a tendency this way. In England, not long ago, a trial was made between a trained bicycle rider and an amateur, the former living on a mixed diet and the latter on a fleshless one, of a fifty mile race, and there was practically no difference in the time they made. A few more such tests would call attention to the subject sufficiently to make a thorough trial practicable. That it would demonstrate that man's strength can be maintained without the use of flesh I have no doubt. There was a time when it was believed that alcoholic drinks were necessary to maintain strength. That day has gone forever. I think we may predict the same result concerning the need of a flesh diet to maintain physical strength. There are too many examples of vegetarian endurance and great working power to make any other result possible.

CHAPTER XII.

FOOD IN VARIOUS DISEASES.

IN DYSPEPSIA.

There are so many forms of dyspepsia that it would be quite impossible to designate, without a knowledge of each case, the foods most suitable; but most sufferers from this disease may be cured by first avoiding its causes, to wit: rapid eating without thorough mastication, and excessive work with muscles and brain.

In most cases the sufferer may take more or less of the following articles, omitting any found to disagree:

Thin vegetable soups, properly made, raw oysters and clams; poached or soft boiled eggs;

Good brown bread and gems, made light, corn bread, boiled rice, rice cakes, stale bread and butter, macaroni, sago, tapioca, Graham crackers, oatmeal and barley gruel;

Green vegetables, such as turnip tops, spinach, cresses, salads, celery, sorrel, lettuce, string beans in moderation, dandelion, asparagus, oranges, ripe peaches and pears, roasted apples, thoroughly cooked dried fruits and grapes freely.

Hot water abundantly, an hour before meals and soon after in small quantities, koumiss, buttermilk, milk and lime water, lemonade, milk and Vichy

water are generally useful. Hot water stimulates the stomach, and has cured many dyspeptics.

In most cases, however, a simple diet made of brown bread, fruit and milk as a staple, and such other articles as will give variety and change are best. The dyspeptic should be cheerful at his meals; tell stories and hear them; eat leisurely and masticate his food thoroughly; after it is in his stomach he should forget that he has eaten, and never think of it again, if he can help it. He had better avoid rich soups, all fried foods, veal, pork, hashes, stews, turkey, all rich gravies, made dishes, sauces, desserts, rich pies, pastries, puddings; crude, coarse vegetables; wines, malt liquors and cordials.

In acid dyspepsia, a most frequent and persistent form of the disease, the peptic glands secrete a far too acid gastric juice. The general opinion that this acid is the result of the souring of the food is, in my opinion, erroneous. The sour eructations appear too soon after eating to admit of such a source. The usual remedy, viz.: bicarbonate of soda, while it gives temporary relief, never cures the patient; and if its use be continued for a long time the effects on the constitution are positively bad. In the first place, the blood is rendered more alkaline than is normal, and this too alkaline blood circulating along the track of the vessels for a long time tends to weaken them. Instead, therefore, of using an alkali, the true remedy is to masticate the food for a long time, so as to mix with it a large amount of saliva, which is alkaline in its nature and helps to neutralize the excessive acid of the gastric juice. Being a natural remedy it does not produce any injurious effects. If this be not

sufficient, a still larger quantity of saliva may be produced and swallowed by chewing, after each meal, some simple lozenge or gum. Any sufferer who will thoroughly practice this will be enabled to relieve himself from his sufferings.

In acid dyspepsia it is important that the bread be thoroughly baked. I have known some patients who could only eat bread twice baked, so as to brown each slice a little. This browning partially converts the starch into dextrine, which is easily digested. The German *zweiback* is a good example of a twice baked bread; granula is another; still another is *gofio*, the principal food of the inhabitants of the Azores. The grain is nicely roasted, but so as to be only slightly browned, and then ground into a fine flour. It may be eaten in milk or water. Wheat and corn in equal proportions make the best. Dr. C. F. Taylor speaks of this food enthusiastically, and mentions the fact that it proved a cure for his own previously obstinate acid dyspepsia. The inhabitants, who live mainly on *gofio* are exceedingly well developed physically, and capable of doing hard work.

IN FEVERS.

In fevers it is important to nourish the patient wisely and carefully. He may generally take Indian gruel, Graham flour gruel, oatmeal and barley flour gruel, baked milk toast, flaxseed tea and rice and milk.

In typhoid fever, milk and koumyss may constitute the principal foods. The juices of fruits, especially grapes, peaches, oranges and lemons are generally admissable. Sometimes there is a crav-

ing for some particular food, in which case it is generally best to allow it. I once had a patient very ill with fever, who begged for lettuce and vinegar, and would take nothing else until I had given him that which was desired; it was relished and did him good.

The drinks in fever should be pure soft water in abundance, rice water, currant jelly water, lemonade, gum arabic water, orange juice and koumyss. Milk, plain or peptonized, guarded with lime water, may be used to great advantage when pure milk disagrees. Drinks made from the juices of fruits in their season may be used as the taste and condition of the patient demand.

DIET IN CONSTIPATION.

Constipation may almost always be cured by the use of brown bread—not taken occasionally, but regularly—and fruit, together with such other articles as are digestible and nutritious.

All fresh vegetables, vegetables with salad oil, boiled spinach and boiled dandelion are appropriate.

Stewed prunes, stewed figs, tamarinds, baked sour apples, dried fruits, such as apples, peaches and pears; melons, grapes—in short, fruits, generally. Oranges on rising in the morning are excellent.

Drink pure soft water abundantly, and especially before meals; a glass of hot water an hour before meals will be useful; new eggs, buttermilk and lemonade are not objectionable, only never overload the stomach with them.

Avoid salt or smoked fish or meat, peas, beans, pickles, pastry, tea, alcoholic drinks and cheese.

See under the head of “Rye,” a method of treating obstinate cases.

IN BRIGHT'S DISEASE.

In this disease a plain, nutritious vegetable diet, including milk, is preferable. Raw oysters and clams may be used. Good brown bread and all farinaceous articles, well cooked, may be used in moderation in their turn, including, of course, rice, hominy, wheaten grits, toast, oatmeal and gruels.

Of vegetables, use in their season spinach, celery, water cress and lettuce.

Of drinks, it is of the utmost importance to have pure soft water—distilled water would be preferable. Fresh milk should be used. I have known a patient almost beyond hope with Bright's disease apparently recover on a diet of bread and milk, with a little fruit, and another on a diet of new milk alone. Such a diet relieves the kidneys of much of their labor, and gives nature an opportunity to repair any injury of these organs. More can be done to cure this disease by diet and hygiene than by drugs.

Let the patient avoid pastry and every form of food not easily digestible. If flesh is used it should be only in the greatest moderation.

CHRONIC RHEUMATISM.

In chronic or semi-acute rheumatism depend on a vegetable diet, especially brown bread, spinach, celery, salads, cresses and all sorts of acid fruits.

Drink pure soft water, hot or cold, in abundance.

Avoid fried fish, cooked oysters and clams, pork, veal, turkey, potatoes; all gravies and made dishes and fried dishes; excess of nitrogenous food; beer and all malt liquors, wines, etc.

In rheumatism, a vegetarian diet will, in most

cases, give great relief, and other hygienic measures will complete the cure, where a cure is possible. A most persistent case of semi-acute rheumatism, which had defied medical skill and Turkish baths combined, coming under my care as a last resource, has been entirely cured by diet, with one bath each week. The bill of fare prescribed was: For breakfast—oatmeal porridge, whole meal bread and butter, fruit, cocoa or weak tea; for dinner—whole meal bread and butter, fruit and vegetables, especially rice in every form, and baked potatoes; for supper—whole meal bread, butter and tea, and fruit if desired. Flesh was forbidden, also all spirituous drinks. A sun bath, with massage and the rubbing of oil on the affected parts, was advised daily, and a Turkish bath weekly. Of course exposure to cold and damp were to be avoided, and medicines given up. Treatment was to be continued six months at least. In that time the patient became well and strong. A very large proportion of sufferers from rheumatism may cure themselves by the same or similar means. It only requires perseverance and good hygienic conditions. It is essential to have the best of whole meal bread. Thorough mastication is also essential. Over eating must be avoided. Gentle exercise is desirable.

DIET IN CORPULENCE.

In corpulence exercise is of the utmost importance, and especially exercises that bring air into the lungs to burn up the excess of fat. Vegetables and farinaceous foods are preferable. Moderation is advised, but very rarely practiced by the patient. Brown bread is always to be eaten. Baked or boiled

potatoes, peas, beans, asparagus, cauliflower, celery, cresses, spinach, cabbage, onions, tomatoes, lettuce, radishes, squash, turnips, grapes, oranges, cherries and acid fruits may be used freely. The grape cure, previously mentioned, will prove useful.

Pure soft water should be taken freely; indeed, it had better be the only drink.

IN GOUT.

In gout use about the same food as in rheumatism. Eat sparingly and exercise as much as possible in order to promote excretion. Live on ten cents a day and earn it.

DIABETES.

In diabetes use as the only bread, gluten bread, so excellently made now by many health food companies, eggs and butter; green vegetables, such as summer cabbage, turnip tops, spinach, water cresses, mustard, sauerkraut, lettuce, sorrel, mushrooms, celery, string beans, dandelion, cold slaw, Brussels sprouts, cucumbers, asparagus, truffles, radishes, onions, olives and olive oil, eggs, etc.

Drink pure soft water, koumyss, buttermilk and acid fruit juices.

Avoid sweet milk, liver, ordinary bread, toast; farinaceous vegetables, such as potatoes, rice, oatmeal, corn meal, sago, tapioca, arrowroot, etc.; saccharine vegetables, such as turnips, parsnips, carrots, green peas, French beans, beet root, tomatoes; sweet fruits of all kinds; all preserves, syrups, sugars, cocoa, chocolate, cordials, sweet wines; alpastry, puddings, ice cream and honey.

A flesh diet is generally advised in diabetes, but according to Dr. Hofmeister, an exclusive meat diet in this disease is dangerous. Diabetics ought to conscientiously masticate every mouthful of food, so as to mix it well with saliva to make its digestion perfect.

IN DIARRHEA AND SUMMER COMPLAINTS.

In these diseases gruels made from baked flour will be useful. Boiled milk is also often suitable. I have found that blackberries stewed with sugar and water, the juice poured off and taken freely is a sovereign cure for diarrhea. Sometimes the juice of peaches and strawberries or any acid dried fruit will answer the same purpose if the blackberry cannot be obtained. I advise that blackberries be dried and kept for emergencies of this kind. Pure water should be provided; and if the water be not pure it should be boiled or distilled. Rusks made from twice baked bread are excellent; they may be taken with fresh milk.

In diarrhea avoid all crude, indigestible food, and all hard or tainted water.

IN CONSUMPTION.

In consumption, the diet should be nutritious and easily digested. Raw oysters, clams, new milk, cream, eggs, butter, olive oil, the best of brown bread from good wheat (that from which the external cuticle has been removed being preferred), corn bread, rye bread and rice; spinach, asparagus, lettuce, cresses, celery, tomatoes and greens; fruits, if

they agree, and baked potatoes may be taken as they are found adapted to the case.

For drinks—hot water, Vichy, pure, soft, spring water, fresh milk just from a healthy cow, goat's milk if the stomach bears it well, and cocoa rather than tea or coffee.

In this dreadful disease the nutritive organs are generally weak and assimilation is poor, so everything that can be done to keep them strong should be done. The fact that air is a food should never be lost sight of in the treatment of this disease, and every effort should be made to get as much of it into the lungs as possible. This is best accomplished by a life in the open air, by horseback riding, by rowing, and by such gymnastic exercises for the chest as will expand and enlarge it. When the season will permit it, the consumptive may even sleep out of doors, in tents or protected places to advantage. I know a lady given over to incurable lung disease, who for several years has slept in a good hammock in the veranda of her summer home during several months each season, to manifest advantage to her health, the object being to secure an abundance of pure fresh air.

Avoid all indigestible food, including pastry, hot bread, etc.

DIET IN NERVOUS DISEASES.

In nervous diseases the patient may choose from a large variety of foods to suit any notion or fancy that takes possession of his mind. In most cases it is preferable for the nervous invalid to confine himself to a wisely-chosen vegetable diet; good brown

bread, milk, cream, butter, eggs, oatmeal, salads and fruits will constitute the principal articles. Of vegetables, baked potatoes, sweet potatoes, cresses, lettuce and celery will all be useful.

Drinks may be chosen from pure soft water in abundance, either hot or cold, cocoa, milk and the juice of fruits, especially orange and lemonade.

DIET IN CANCER.

Cancer is a disease more frequent among those who live high than among those who live low, and it is comparatively rare among those whose food is mainly drawn from the vegetable kingdom. Several cases of its cure have been recorded by adopting an abstemious vegetable diet, mainly one of fruit and bread, with a little milk or cream. This seems reasonable, at least, especially in the early stages of the malady; at any rate, the experiment is well worth trying, particularly in connection with other hygienic conditions, which cannot be mentioned here.

ULCERATION OF THE STOMACH.

This rare disease requires the greatest care in diet. Milk, either with or without lime water, comes nearest to the requirements of any food. It is bland and unirritating, which is important. But little should be taken at a time—a teaspoonful, or even less, is enough at first. This may be repeated in an hour, and so on through the day. In increasing the amount use the greatest care, so as not to bring on a relapse. Of course such a meagre diet will not support the patient perfectly; but if he

avoids all expenditure of strength so far as possible, it will keep him from starvation until nature heals the ulcer, which will not take very long. Some of the worst cases have been cured by this diet.

MARASMUS.

Marasmus and wasting diseases I have found, especially in the young, if over two years of age, best overcome by the use of whole meal gems and new milk and the juices of stewed fruits, especially the juice of stewed dried apples cooked with some sugar. At first the bread may be soaked in the milk; much of its valuable salts and other soluble matter will in a little time be dissolved. Such cases usually need oil, and it is best applied hot on the skin in the form of an oil bath. It is wonderful how much will be absorbed by a starving child's skin in a day. I have treated a few of the most hopeless cases in this way with most excellent results. It requires the aid, however, of the most faithful mother or nurse, willing to co-operate with the physician, to produce the best effects. The general feeling that such sufferers require raw meat has demoralized people so much that not every mother will trust to such treatment until all others have failed.

DIET FOR THE THIN.

Some people are constitutionally inclined to be thin, as others are to be fat, and it is almost impossible to change their nature. I remember once owning a horse that would not take on flesh. He was very high spirited, always uneasy and inclined to go. His nervous system was excitable, irritable.

The sight of a whip would cause him to spring forward with a bound. An uncle of mine, whose horses were always fat and sleek, told me I must quiet down his nervous system if I wanted him to take on flesh, and he told me how to do it. Following his directions I changed the slender, excitable creature to one quite round and gentle. With many human beings there exists the same difficulty. They are lean by nature, perhaps, and never easy or restful. Their nervous systems need to be quieted and calmed; then they may increase in flesh. Their food should contain more fat and starch than that for persons of an opposite tendency. Cream, milk, sugar, cocoa, butter, etc., may, with other articles of a similar nature, be used freely, providing they agree with the stomach and are well borne.

DIET FOR INEBRIATES.

The diet for inebriates is most difficult to manage, as such patients have perverted their normal sense of taste so that simple, nutritious food has lost all its charms. Something is demanded which will make a strong impression on the nerves, as pepper, salt and other condiments. So long as this perversion continues a radical cure is difficult. On this account it is highly important that the inebriate and, in fact, all who are addicted to strong drinks, makes every effort to re-establish a natural sense of taste, a love for simple, nutritious, but unstimulating food, and especially for the finest fruits in their season. It would be well for him to begin every meal with an orange, or with some very fine grapes, or a perfect melon; to abstain from all spices and

condiments, except a little salt, and to persevere in this for a long time. I do not say that it will cure the confirmed inebriate; but it will aid materially, and many cases not confirmed may be prevented from becoming so. As I have said elsewhere, the sanitarian and the cook have an important mission in stemming the tide of intemperance; and they have also an equally important work in helping to cure the victims of alcohol. The hot water cure for inebriates is to be recommended.

FOOD FOR ORPHAN ASYLUMS, PRISONS, ETC.

Orphans condemned to live in asylums should be fed better than they are, and a rightly constituted vegetable diet would be most beneficial. Of course if the diet adopted be not wisely selected it will fail; but if wisely selected it will not fail.

In Mr. Fegan's Homes for Boys, in London, it was adopted several years since with great benefit, and he now writes concerning it as follows:

“I am often asked if the boys in our Homes are still fed on a ‘non-flesh’ diet, and if so, how we find this system (for after three years’ experience it can hardly be still called an experiment) to answer. I take this opportunity of explaining that our boys have been living on a ‘Vegetarian’ dietary since the spring of 1885, with great advantage to their general health. Many of the boys in our Homes come from a weakly stock; many of them have had their constitutions debilitated by neglect and exposure; yet the incontestable fact remains that the general health of the boys is not only better than in ordinary families, but better than it has ever been

before in our Homes. If our boys, instead of being brought up as the elder ones are, in a densely populated neighborhood like Southwark, were reared in the suburbs or country, I suppose sickness of any kind would hardly ever be known amongst them. I am sure that our medical officer will bear me out that the appearance of the boys has greatly improved, and that with a truly remarkable immunity from ailments of all kinds during the last three years. It must be remembered that we use only whole meal bread, and that every meal is *ad lib.*”

If boys are to be reformed they must be well fed, whether their food is mixed or not. Indeed, it is a crime to feed them on cheap or insufficient food, as is too often the case. They should always have whole meal wheaten bread, butter, milk, eggs, fruit, potatoes, oatmeal, corn meal and cocoa as much as they require.

PURE FOOD.

Pure food is very important, and the consumer must consider this. Impurities that pass into the blood continue their course with the nourishment to the very minutest ramifications of the blood-vessels, and even into the so called cells, cannot promote nutrition, but, on the contrary, retard and prevent it.

Much has been said of late concerning diseased flesh and milk as causes of consumption. We have yet no reliable facts as to whether this disease may really be transferred by flesh and milk from animals to man, though the probabilities favor it. But even if there be no real danger, none of us feel

like eating diseased flesh or milk, even when well cooked. There is no doubt that the danger from impure and diseased food is greater than from diseased vegetables; though in the latter we are not altogether free. It requires thoughtfulness and painstaking to always secure pure food, and it is worth all the trouble it costs.

CLIMATE AND SEASONS.

Climate and seasons have a marked influence on the amount and kind of food demanded. In cold seasons and regions more hydrocarbons and fats are required than in warm climates and parts of the year. The extra amount is needed to restore the loss of animal heat by exposure to the cold. To some extent, however, we modify this by clothing, warm houses, etc. Those who pay most attention to this subject in temperate regions, as soon as the winter gives place to spring demand fresh vegetables, salads and articles rich in water and mineral salts, and this is a wise thing for all. To those, however, who provide an abundant supply of fruit for every season of the year, and who do not during winter eat heavy meals of indigestible food there is less need of this than for others.

COOKERY.

Cookery should be both a science and an art. The cook should be educated, should know the value of all foods, know how to combine them in order to procure a suitable proportion of all their ingredients for the daily needs of the body, and how to preserve and bring out their best qualities and proper-

ties. Men as well as women should learn the art and the science of preparing food properly. Women are more inclined to take to the art side of the subject, and men to the science of it. A combination of their knowledge and of their tastes is preferable to either alone. The fundamental principles of all cookery should have their foundations laid deep in knowledge. This would render the subject a delight instead of as now, a drudgery.

RECIPES.

SOUPS.

SOUPS are often complicated and expensive, requiring much money, time, and attention to prepare them. These difficulties are avoided in the following recipes, and a few trials will enable any one of ordinary understanding, who will follow the directions, to produce cheap, wholesome, and agreeable soups, without shins, knuckles, scrags, bacon, or drippings.

SPLIT PEA SOUP.—Put one pint of split peas, which have been previously soaked in cold water four hours, into two quarts of pure soft water. Let them boil for one hour, then add one carrot, one parsnip, one turnip, two onions, a small head of celery, and a little mint, all cut small, and boil the whole another hour. Strain the soup from the vegetables, and thicken it with a little Indian meal, previously mixed in cold water; boil the whole for ten minutes more, and serve in a tureen with toasted or plain wheat-meal bread. Mix the vegetables well, and put them into a mould or a basin, and then into a vegetable-dish, and serve it with steamed or baked potatoes. Salt moderately.

BEAN SOUP.—Wash and pick over one pint of white beans; steep them twenty-four hours in pure soft water, put them into a stew-pan (earthen and enameled is best), set them on the fire in two quarts of water, let them boil for two hours, then add two onions, one parsnip, one carrot, a little parsley and thyme cut small, a little cold boiled rice, and a little salt. Boil the whole gently for another hour, and serve it the same as pea soup. Salt to taste.

BARLEY AND BREAD SOUP.—Take three ounces of barley, one and a half ounces of stale bread-crumbs, one and a half ounces of butter, one-half ounce of salt, and one-quarter ounce of parsley. Wash and steep the barley for twelve hours, in one-half pint of water, to which a piece of carbonate of soda, the size of a pea, has been added; then pour off the water not absorbed, and add the crumbs of stale bread, three quarts of boiling water, and the salt. Digest these in a salt-glazed covered jar, in the oven, or boil them slowly in a well-tinned covered pan, for from four to six hours, adding the chopped parsley, with the butter, thirty minutes before the expiration of the time of boiling.

BROWN SOUP.—One pound of turnips, one pound of carrots, half a pound and six ounces of onions, one and a half pints of peas, four ounces of butter, and half a pound of bread. Cut the vegetables into small pieces, put them in a pan with the butter, cover the pan, and let them stew over the fire till brown occasionally stirring them; put in the peas with the water in which they were boiled; add sufficient boiling water to make three quarts altogether; next add the bread, which should be browned or toasted before the fire, but not burnt; season, and let the soup boil gently for three or four hours; rub it through a coarse sieve, return it into the pan; let it boil, and it will be ready to serve. If dried peas are used, they should be steeped for twenty-four hours in soft water, and boiled for two hours.

BARLEY SOUP.—Three ounces of barley, one and a half ounces of stale bread crumbs, one ounce of butter, quarter of an ounce of chopped parsley, and half an ounce of salt. Wash, and steep the barley for twelve hours in half a pint of water, to which a piece of soda, the size of a pea, has been added; pour off the water that is not absorbed; add the bread crumbs, three quarts of boiling water, and the salt; boil slowly in a well-tinned covered pan for four or five hours, and add the parsley and butter about half an hour before the soup is ready to be served.

CELERY SOUP.—Six roots of celery, one large turnip, two ounces of onions, four ounces of bread crumbs, one ounce of butter, one desert-spoonful of flour, and half a pint of cream. Strip off all the green part of the celery, using only the white; cut it in shreds, reserving the inside of three of the roots to be added afterward; slice the turnip and onion, and put them with the celery into a pan; add two quarts of water, the bread crumbs, and a little salt; let all boil till the vegetables are perfectly soft; rub through a sieve; return it to the pan; add the celery (previously boiled till quite soft), the butter, and flour, well mixed; stir it, seasoning it with a little mace; and, after boiling a quarter of an hour, stir in the cream, but do not allow it to boil afterward.

BROWNING FOR SOUPS.—Three large spoonfuls of brown sugar; one half pint of boiling water. Put the sugar into a frying-pan, set it on the fire to brown, stirring it with a wooden spoon, that it may not burn. When sufficiently dark-colored, stir into in the boiling water; when thoroughly mixed put it into a bottle; and, when cold, cork it closely down, and use a tablespoonful or more, as may be required, to give a color to your soup. A burnt onion or two can be made of use for the purpose of browning, and is often considered better than the above recipe.

NOTE.—For the convenience of those who have not an opportunity of weighing the ingredients for the soups, it may be stated that one large tablespoonful will be about equal to one ounce, and one teaspoonful to a quarter of an ounce. But weighing should be resorted to whenever it is possible.

POTATO SOUP.—One quart of potatoes, pared and cut into small strips or blocks, a large sprig of parsley, the same of thyme or sweet marjoram, cut fine; boil three-fourths of an hour in three quarts of

water, then add half a pint of cream or new milk ; put a small table-spoonful of butter into a plate where it will soften, and stir into it two spoonfuls of flour, add to the soup, and boil five minutes. Drop-dumplings made with a little flour and cream, yeast and milk are an addition.

GREEN-PEA SOUP.—Take two quarts of green-peas, one small onion, and a sprig of parsley cut fine ; add two quarts of hot water, and boil slowly for half an hour, then add a pint of small new potatoes which have been peeled and laid in cold water an hour ; put in a table-spoonful of sugar and a little salt, boil till the potatoes are done, now add a teacupful of cream or a pint of milk, boil a minute or two, and serve with small slices of toasted bread or gems cut in halves.

TOMATO SOUP.—Take two quarts of fresh, round tomatoes, scald and peel, without breaking ; do not cut or fork them. Put into a porcelain kettle, or fire-proven stone vessel, add two quarts of boiling water, and a teaspoonful of salt, and set on the fire or in the oven, cover, and let them stew slowly three quarters of an hour. Mix two table-spoonfuls of flour with a table-spoonful of butter, or a teacupful of good cream, which has been boiled, stir into the soup, and let it boil together ten minutes, and dish up with small thin slices of well-toasted bread. Be careful to let the tomatoes remain whole, as you would oysters.

A teacupful of grated corn added to the soup when you put in the flour, etc., will be an excellent addition, and render the imitation of oyster soup more complete. Simmer the corn only ten minutes, if it is fresh and full of milk.

NOTE.—We give you only one or two meat soups, and these with special reference to tomatoes. Meat soups are well known in almost endless varieties, but good vegetable soups are scarce.

BEEF AND TOMATO SOUP.—Take two pounds of red beef—a neck piece, or from the round ; carefully remove all the fat, and cut the meat into small bits ; put into a stewpan with two quarts of cold water, and simmer slowly one hour. Remove all the scum as soon as it rises, and keep covered close. Scald until quite soft, one quart of nice ripe tomatoes, and press through a colander ; add to the broth from which you have removed the meat, and boil half an hour ; put in a sprig of sweet marjoram or thyme, then take two ears of sweet-corn, and cut and scrape all the kernels from the cob, also two table-spoonfuls of flour and one of sugar, browned but not burned, mix with half a teacupful sweet cream or milk ; add these ingredients and boil fifteen minutes. Season with a little salt and cayenne pepper.

NOTE.—You will observe that all the ingredients of this soup require but little actual cooking. The pure nutriment of beef is found with rare cooking. Tomatoes lose their fine flavor by much boiling, and corn hardens at a certain period—fifteen or twenty minutes, if it is fresh and full of milk, is sufficient to cook corn.

ANOTHER.—Make a soup of bones or bits of meat left from a roast, add a little cabbage, sweet potato, and parsley cut fine, boil till well done, then cut or grate a pint of green corn and half a dozen fresh

tomatoes, boil these with the soup fifteen or twenty minutes, and serve.

NOTE—Remove all the fat from the meat before putting it into the water, and skim off what remains as soon as it rises. This is far more wholesome and relishable than *stock* prepared some days beforehand. Stale meats are the same, even in soup.

VERMICELLI SOUP.—Six ounces of vermicelli, two quarts of new milk, the yolks of four eggs, and one pint of cream. Blanch the vermicelli by setting it on the fire in cold water; when it boils, drain off the water, and put it into cold water; let it remain a few minutes, and then drain the water entirely from it; put it into a pan with the milk, and boil it; beat up the yolks of the eggs, and after gradually adding a pint of boiled cream, strain through a sieve. Take off the pan; add the eggs, cream, a small lump of white sugar, and a tea-spoonful of salt, and stir the soup on the fire till near boiling.

BARLEY BROTH.—Four ounces of Scotch barley, four ounces of onions, four ounces of oat-meal, or Indian meal, and two ounces of butter. After washing the barley well, steep it in fresh water for twelve hours; set it on the fire in two quarts of water, adding the onions and a little salt, and boil gently for an hour and a quarter. Melt the butter in a saucepan; stir in the meal till it becomes a paste; then add a little of the broth gradually, till it is a proper thickness to mix with the whole quantity; stir well together till it boils, and mix with a little of the broth a drachm of celery seed, pounded; stir well in the broth; simmer it gently a quarter of an hour longer, and serve.

PORRIDGES.

WHEAT-MEAL PORRIDGE.—Having boiled one quart of soft water, and mixed half a pound of meal in a *little* cold water, mix them together, and boil for fifteen minutes, stirring it occasionally. Pour it into basins and let it stand for ten minutes. To be eaten with fruit, sugar or molasses, and bread.

INDIAN-MEAL PORRIDGE.—Make same as the wheat-meal porridge, only that it must be cooked for nearly an hour, and be made thinner, to allow for the evaporation which comes from the boiling.

INDIAN FARINA PORRIDGE.—To one pint of boiling water add four tablespoonful of farina; mix and serve the same as the wheat-meal porridge.

ARROWROOT PORRIDGE.—Mix one ounce of prepared arrowroot with a table-spoonful of cold water, then pour *boiling* water on it to make it the required thickness, stirring it well at the same time. A slice or two of lemon with a little sugar will be found an improvement. To be eaten with crackers or bread.

BOILED WHEAT PORRIDGE.—Having soaked over night one pound of good wheat in pure soft water, strain the water off and add a quart of fresh; stew it gently till quite soft. It may be eaten as wheat-meal porridge.

SAGO PORRIDGE.—Four tablespoonsful of sago, one salt-spoonful of salt, and one quart of water. Soak the sago in cold water for a few minutes, and boil it gently about an hour, adding the salt; pour it into soup-plates, and serve with molasses or sugar.

SAGO AND RICE PORRIDGE.—Equal quantities of sago and ground rice. Proceed as with sago porridge.

MILK PORRIDGE.—Take of new milk a pint and a half, and half a pint of water; place it over the fire. When just ready to boil, stir in a tablespoonful of flour, wheat-meal, oat-meal, or Indian corn-meal, previously mixed with a little water; after boiling a minute pour it on bread cut into small pieces. As milk burns quicker than almost any other article of food, it is always best to put it into a tin pail or farina kettle, which is or can be surrounded by boiling water while heating, then you are sure of not burning it.

ARROWROOT GRUEL.—Take one ounce of arrowroot, and two large tablespoonsful of preserved black currants. Put the currants into a pan with a quart of water; cover the pan and let them stew gently about half an hour; then strain the liquid and set it on the fire; when boiling pour it gradually upon the arrowroot, previously mixed with a little cold water, stirring it well; return it into the pan and let it boil for a few minutes gently, adding sugar if required.

SAGO GRUEL.—Take two tablespoonsful of sago and one quart of water. Wash and soak the sago a few minutes in cold water; stir it into the rest of the water when boiling; boil slowly till the sago is well done, and add sugar and nutmeg as required.

TAPIOCA GRUEL.—Wash a tablespoonful of tapioca and soak it in a pint and a half of water twenty minutes; then boil gently, stirring frequently, till it is sufficiently cooked, and sweeten.

GROAT GRUEL.—Pick the groats very clean and steep them in water for several hours; then boil them in soft water till quite tender and thick, and add boiling water sufficient to reduce the whole to the consistency of gruel, also currants, sugar, and grated nutmeg. Groats are made of oats' grain, the hulls being removed and the grain left quite whole, as are all preparations of this grain. This gruel is very nutritious.

REMARKS AND RULES FOR GOOD BREAD.

With good flour, a good oven, and a good, sensible, interested cook, we can be pretty sure of good, wholesome bread. Yeast bread is considered the standard bread, and is, perhaps, more generally found on every table than any other kind. Hence it is important to know how to make good, sweet, wholesome, yeast bread. Good flour is the first indispensable, then good, lively yeast, either yeast cakes or bottled, the former is preferable in all respects. Then, of course, there must be the proper materials to work with. A bread bowl or pan—the pan is easiest kept clean—a stone or earthen jar for setting the sponge; a sieve—flour should always be sifted before making bread of any kind

first, to be sure that it is perfectly clean, secondly, sifting enlivens and aerates the flour, and makes both mixing and rising easier and quicker; a clean, white cloth to cover the dough, and a woollen blanket to keep the dough of even temperature while rising; baking pans, deep and shallow, a large, strong spoon for stirring, and a little melted suet or fresh butter for oiling the pans; never use poor butter. If you want shortening, rich milk or cream scalded and cooled will answer the purpose and be most wholesome. But thorough kneading is better still, and should always be done effectually. Scalding a portion of the flour makes a sweeter bread and speeds the work. Water, milk, or butter—milk may be poured boiling hot on a quart or two of the flour, stirring well, and cooling to a moderate temperature before adding the yeast—this makes the *sponge*. Scalded flour always makes a little darker bread, unless we use buttermilk, which makes a rich, creamy, white bread. Yeast is *fermented* flour or meal—the first stages of decomposition or decay. Understanding this, every baker will comprehend the necessity of regulating the extent of the fermentation with the greatest care: for a sponge or bread fermented or “raised” too long, is decomposing, spoiling—actually rotting! This is the language of an experienced English baker to us only a few days ago, during a talk about the delicate, foamy loaves “yeasted to death,” which so many families are eating and calling “the staff of life,” quite discarding the firm, sweet, substantial, home-made loaf which our mothers and grandmothers kneaded with their own skilled hands. Bread-making should stand at the head of domestic accomplishments: since the health and happiness of the family depends incalculably upon good bread; and there comes a time in every true, thoughtful woman’s experience when she is glad she can make nice, sweet loaves, free from soda, alum, and other injurious ingredients, or an earnest regret that she neglected or was so unfortunate as not to have been taught at least what are the requisites of good bread-making.

YEAST.—Dry yeast or yeast cakes are more convenient and less liable to taste in the bread than bakers’ yeast. Two or three times a year there should be a fresh supply of yeast cakes prepared and carefully put in a dry place. Yeast cakes are manufactured and sold, some of which are very reliable. To make dry yeast, steep for half an hour a handful of fresh hops in a quart of boiling water. Sift two quarts of flour in an earthen or stone pan, and strain into the flour the *boiling* hop tea. Stir well and let it cool, when lukewarm add a cent’s worth of baker’s yeast or a cupful of good home-made yeast, and put in a tablespoonful of brown sugar, a tablespoonful of ginger, a teaspoonful of salt, mix thoroughly and let it rise. It is best to prepare this sponge over night, and early in the morning it will be rounded up and light, and give you all day, which should be sunny and breezy, to make and dry the yeast cakes. Now mix into the sponge as much good corn meal as will make a stiff, firm dough, knead it well and make it into a long, round roll three or four inches in diameter. Cut it into slices half an inch thick, spread a clean cloth or clean paper on a board and lay the cakes on and put into a light, airy place to dry. Turn them several times during the day, and speed the drying as fast as possible, as the fermentation goes or while they remain moist. When dry put

into a bag made of firm linen or cotton, tie close, and hang high and dry.

BREAD WITH SCALDED SPONGE.—Set your sponge the last thing at night, thus: put one yeast cake to soften in a half cup of warm water, sift two quarts of flour into a bowl or pan that will hold four quarts, scald the flour with a sufficient quantity of *boiling* water to moisten it all. Stir very thoroughly till it is free from lumps and cool enough to put in the yeast cake, add the yeast, and set to rise in a warm place in winter, or in a cool place in summer. In the morning before breakfast the sponge will be risen round and foamy, and should be made immediately into dough. Sift as much flour as you need into your bread bowl or pan, and in cold weather to warm the flour will gain you time and credit. If you wish to make a Graham loaf or two, save one-third of the sponge for that, and mix the rest into the sifted and warmed flour, add a pint of warm water, or sufficient to make the flour into a firm dough, and knead until smooth and free from the board and hands. Put the dough back into the bread pan, cover with a clean cloth, and wrap a warmed blanket over the whole to keep from the air. The more muffled you wrap it the sooner the bread will rise. If the temperature has been just right, the bread will be ready to mold into the baking tins in less than two hours. Have the pans cleaned and greased—divide the dough into loaves which will two-thirds fill the pan, knead lightly with a little flour on the board, but use no more than you can help. Cover slightly and let it rise again till the loaf looks as large as it should be. Now the oven should be hot, with a firm steady fire, which will last three quarters of an hour; fresh fuel ought not to be added till the bread is finished. Every cook should know just what her oven will do, and be governed accordingly; if too hot at the bottom set the pan up an inch, if too hot at the top cover the loaf with brown paper, open the oven as little as possible. When baked, remove the loaf at once from the pan and put to cool on a rack, or resting it on one edge. Never cover or allow bread to sweat in the baking tins, the crusts will soften as they cool. Good flour and properly made bread will not have hard crusts. When *cold*, wrap the bread in the bread cloth and put into a tray or into a clean tin boiler, cover, but not airtight. Bread thus made will be good and fresh for several days.

REMARK.—The keen fermenting odor which starts up when the dough is ready for the second kneading is not sour, nor does it need soda. Soda kills the lively quality of yeast.

YEAST GRAHAM BREAD.—Take the remainder of the white flour sponge, a tablespoonful of sugar, and three pints of warm water; mix with them Graham flour into as stiff a dough as you can stir well with a large spoon. Beat it up thoroughly for ten minutes, or, if you cannot manage the spoon, dip the hand into water, and work the dough till it is very smooth. Let it rise two hours, then stir it up and put it into deep baking-tins, and let it stand till it begins to rise again. Bake in a quick oven one hour. Graham flour ferments quicker than fine flour, and should not be allowed to rise so long. If, when the bread is cold, it seems too soft, remember, the next time, to mix the dough a

little stiffer. The precise consistency cannot be guessed always, as some wheat works softer than others. The sweetening can be left out with propriety. Indeed, we never could see why Graham flour should be sweetened at all, as it has all the sugar of the grain left in, while fine flour has had the sugar taken out by the process of bolting.

BREAD WITH POTATOES.—Potatoes assist fermentation, and render the dough lighter and more tender when we wish to make bread in haste. Peel and boil, or steam, a quart of potatoes, mash them very fine, or, what is better, press them through a colander while they are hot, add half a pint of water and a salt-spoonful of salt, stir them into a batter, and then put in a yeast cake previously softened, or a teacupful of lively yeast, and make into a dough with two quarts of sifted flour. Knead it half an hour, put plenty of flour on your board, and knead it until it cleaves from the board with a light tearing sound. Be careful not to let your dough grow very cold while you work it. Divide into loaves, and set to rise in a warm place. Watch the process, and when the loaves are quite light have your oven in good heat and bake three quarters of an hour. This bread is very nice if well made, *i. e.*, the potatoes made very fine and kept hot, and perhaps the flour warmed also; but it is not so good when stale as that made with a scalded sponge.

DELICIOUS BISCUIT.—Made in the same manner, only adding half a pint of sour cream instead of the water. Bring the cream to a scalding heat, and put in a teaspoonful of soda; mix otherwise the same. Set to rise in the bowl, and, when light, make into small cakes. Put them close in the pan, and let them rise *upward* within an inch of the top of the pan and bake.

BUTTERMILK BREAD.—Put three or four pints of *fresh* buttermilk into a saucepan and boil it. Stir it pretty constantly while it is heating, to keep it from separating into whey and curd. Have a quart of flour sifted into a suitable vessel, pour the boiling buttermilk on the flour, and scald it thoroughly. Stir until all the flour is mixed, and set to cool. When sufficiently cool add a teacupful of good yeast, and let it rise over night; in the morning sift and mix into the sponge enough flour to make a *stiff* dough; knead well, and set to rise for two hours, then divide into loaves and knead slightly. At this time use as little flour as possible. Set to rise again, and bake as soon as light enough. Bake in a steady oven three quarters of an hour. This is a good sponge for dark, or runny flour. The bread will be white and moist. Graham flour, prepared with scalded buttermilk, mixed a little stiffer than where sweet milk or water is used, is very sweet and good. Do not put soda into the milk or sponge. It will be perfectly sweet when it is baked if the yeast is fresh, and if the whole process is carefully attended to in the right time.

SWEET POTATO BUNS.—Boil, and then mash three good-sized sweet potatoes with a pint of cream or new milk; mix with as much flour as will make a dough as for bread, adding a teacupful of good sponge or yeast. Knead well, and set to rise. Always wrap your blanket close around the bowl, and place where the wind or cold air does not come,

If you wish a quick rising. As soon as the dough begins to crack open mould into small rolls and put close together in the baking-pan. When sufficiently light bake in a moderate oven half an hour.

GRAHAM MUFFINS.—Dissolve a half cake of yeast in a little warm water, scald a quart of milk and pour it into two quarts of Graham flour, stir well, and let it cool sufficiently, then put in the yeast and a spoonful of brown sugar, make a very thick batter, which will heap on the spoon ; set to rise over night. In the morning have a good hot oven, butter your rings and the pan well with cold butter, fill the rings two-thirds full, let them stand a few minutes in a warm place, then put into the brisk oven and bake half an hour.

BREAD MUFFINS.—Take four slices of *baker's bread*, and cut off the crust. Lay them in a pan, and pour boiling water over them, only just sufficient to soak them well. Cover the vessel with a cloth, and when it has stood an hour draw off the water, and stir the soaked bread till the mass is quite smooth, then mix in two tablespoonsful of sifted flour and half a pint of milk, and stir in, gradually, two well-beaten eggs. Butter some muffin rings, set them in a buttered bakepan, and fill each two-thirds full. Bake brown, and send to the table hot.

BUCKWHEAT CAKES.—One quart of buckwheat flour and a half a pint of Graham meal. Mix with lukewarm water into a batter, stir in a teacupful of good yeast sponge or a half cent's worth of baker's yeast ; mix in an earthen or stone vessel, and set over night in a warm place to rise. If the temperature and yeast have been just right, the batter will be light and sweet, and not need soda. It should be considered a mistake when the ferment needs neutralizing, and care taken to set cooler or correct the yeast.

BUCKWHEAT GRAVY.—Buckwheat cakes are often considered rather an unwholesome dish ; but we think that the fault comes from the excess of melted butter and syrup, which is usually eaten with them. Substitute *this*, at least for the children :—Boil a pint of milk and half a pint of cream, put in half a teaspoonful of salt and two or three large spoonsful of buckwheat batter, dip a spoonful and put directly into the boiling milk, wait for it to boil up, and then add another till you get a proper consistency, boil a minute longer, and pour into a tureen or pitcher for the table.

GRAVIES—May always take the place of butter and syrup when griddle cakes are to be eaten, simply by boiling a pint of milk or cream and adding a spoonful or two of the batter of which the cakes are made as a thickening, a little salt and a very little lump of butter may be added. Children are far better satisfied with a creamy gravy than with butter.

HYGIENIC BREAKFAST CAKES.—One pint of fresh oatmeal, one quart water, let it stand over night. In the morning add one teaspoonful of fine salt, one tablespoonful of sugar, and the same of baking powder, and one pint of Graham flour. If the above proportions make a batter

too stiff for griddle cakes, add more water. If gems are preferred instead of cakes, the addition of a little more flour is all that is required to produce an extra article.

OATMEAL BREAD.—One quart fresh oatmeal, two quarts of water, let stand half a day or over night. When ready to bake, add one quart of fine, or Graham flour, half a cup of sugar, one teaspoonful fine salt, two teaspoonsful of baking powder; mix with a spoon. No kneading is required. If too stiff, add water.

CORN CAKES.—Three cups of corn meal, one cup of Graham flour, two teaspoonsful of cream yeast powder sifted together, one cup of cream, and half a cup of milk, one egg well beaten; stir altogether well and quickly; heat your gem irons hot; butter and fill; bake with a brisk heat. Gem *tins* or forms do not need to be heated before filling, they may be oiled and filled on the table, and put into a quick oven.

GRAHAM GRIDDLE CAKES.—Into one pint of Graham flour and half pint Indian meal mix thoroughly two teaspoonsful of cream yeast and half teaspoonful salt, beat up well one egg and mix with one pint cold water, into which mix thoroughly the flour as prepared, and fry at once.

GOLD MEDAL CORN CAKES.—Mix two heaping teaspoonsful of cream yeast and half teaspoonful of salt thoroughly through one pint of Indian meal and half pint of sifted flour, beat well one egg and mix in one tablespoonful of brown sugar, half pint milk or cold water, and stir in the meal as prepared, to the consistency of a thick batter, steam until half done in a three pint basin, and finish by baking in a hot oven, or drop into hot cup or gem pans well buttered, and bake in a hot oven.

CORN GEMS.—Mix two heaping teaspoonsful of cream yeast and half teaspoonful of salt thoroughly through one and one half pound sifted Indian meal; stir the meal as prepared slowly into one pint (more or less) of sweet milk or cold water, so as to make a very thin batter, place in hot gem tins or cups, let them stand five minutes in a warm place and bake in a very hot oven.

YANKEE STRAWBERRY SHORT CAKE.—Mix two heaping teaspoonsful of cream yeast and half teaspoonful of salt thoroughly through one quart of sifted flour, beat well one egg, and mix in two tablespoonsful melted butter, one of sugar, nearly a pint of sweet milk or cold water, mix in the flour as prepared, as thin as convenient to handle, knead but little, let stand five minutes in a warm place, bake in a quick oven; cut into three layers, place sugar and strawberries between and dust upper crust with sugar.

SQUASH CAKES.—Mix Graham flour with half its bulk of stewed squash, or pumpkin, and add milk enough to make a thick batter, about a cup of milk to each cup of squash. Put in one teaspoonful cream yeast, mixing it well with the flour. Cook on a griddle.

BOSTON BROWN BREAD.—Take three pints of Indian meal, sifted and one quart of rye meal, sifted. Stir into the corn meal one teaspoonful of salt and one teacupful of molasses, and wet it to a batter, as thick as that used for griddle cakes, with boiling water; then set it aside to cool. Stir one large coffeecupful of sour milk, or buttermilk, into the rye meal, add to it one teaspoonful of soda dissolved in two tablespoonsful of boiling water, and boil on the stove for two minutes, or until it is in a light froth.

Mix together the corn and rye meal batter with the hand, beating it well. Let it stand for fifteen minutes, then turn into an iron bake kettle, and bake for three or four hours. This will make a large loaf of bread, but it is better to bake it all in one pan, as a very thick, hard crust forms over the whole, and if one likes, it can be partly removed while hot, and eaten with milk or cream, for it makes a very palatable dish for breakfast or supper.

We prefer to *bake* brown bread, however, by steaming it in a large tin pudding dish for three hours, placing the tin in a kettle of boiling water, and not letting it boil over the top of it. Then it is put into the oven for another hour; and this way of cooking it will form no crust that is not easily eaten, and gives the bread a delicious flavor, and it will remain moist for several days. When it is two or three days old it is much improved by being warmed in the oven or toasted.

APPLE BREAD.—Weigh one pound of fresh, juicy apples, peel, core and stew them to a pulp, being careful to use a porcelain kettle or a stone jar, placed inside an ordinary saucepan of boiling water; otherwise the fruit will become discolored; mix the pulp with two pounds of the best flour; put in the same quantity of yeast you would use for common bread, and as much water as will make it a fine, smooth dough; put into an iron pan and place it into a warm place to rise, and let it remain for twelve hours, at least. Form it into rather long-shaped loaves, and bake in a quick oven.

FRUIT CORN CAKES.—Put a pint of whortleberries in a bowl, add a teacupful of sugar, one pint of corn meal and a large tablespoonful of fine flour, wet with boiling water. Bake in cakes about one-half an inch thick on a griddle or in an oven twenty minutes. For nice apple cakes use sweet and tart apples, chopped, instead of berries.

OAT MEAL OR SCOTCH PUFFS.—One quart of sweet milk, three well beaten eggs, two and a half cups of oat meal, one and a half cups of Graham flour, and a little salt. Use a medium-sized cup. Heat and oil the gem irons and bake in a quick oven.

GRAHAM FLOUR PUFFS.—One quart of sweet milk, two eggs, flour to make a thin batter, fill the gem cups two-thirds full, bake in a quick oven.

RICE GRIDDLE CAKES.—Cook half a teacupful of whole rice till every grain is dissolved and like jelly. Warm half a pint of rich milk, put in half a teaspoonful of salt, stir the rice into the milk till it is smoothly mixed. Beat three eggs, whites and yolks separately, till very light, and put into the rice and milk the last thing. Bake on a hot greased griddle till brown and light.

INDIAN GRIDDLES.—Two cups of meal, one of flour, one of milk, one of water, one egg well beaten, two teaspoonsful of cream yeast sifted into the meal and flour. Mix and bake on hot griddles,

GRAHAM GEMS.—You are supposed to have the baking irons or “setting” for these gems; else we don’t know what you will do. They are to be had of hardware dealers; at least no kitchen is furnished without them. These gems are displacing all other kinds of coarse bread on our table. They can be eaten with butter or without butter, hot or cold, morning, noon, and night. They are as handy as crackers; are just what you want for children’s lunch, and to fill in when you are making up a picnic basket. They are not only hygienic, but are good in the mouth. They have an almond-like sweetness, and their fibre is like that of nut-meats, giving the teeth just the exercise they crave. No taste of “emptyings.” But to our receipt, which will not be half as long as this preamble. Put the irons in the oven, where they will get hot by the time you have mixed the gems. Then take milk and water, half and half, and stir in Graham flour, No. 1, till you have a batter that will “drop from the spoon and not run.” Stir very thoroughly, the more the better. Drop into the hot irons and bake immediately. (If you are quick you can take the irons out of the oven for better convenience in filling.) The oven is a grand point. It should have a solid heat, and bake as fast as it can and not burn. “If at first you don’t succeed, try, try again.” Make the batter a little thicker or thinner, the oven a little slower or quicker (quicker more likely). There is a way, and you will find it, and then be able to repeat your success as often as you wish.

WHEAT MEAL UNLEAVENED CAKES (GEMS).—To one quart of soft, cold water, add, by degrees, three pints of coarsely ground wheat meal. Stir rapidly, with a large spoon, three or four minutes, so as to incorporate a large amount of atmosphere. Dip out into iron baking molds, which have been heated hot and oiled. Bake immediately in an oven as hot as it can be and not burn, for twenty or twenty-five minutes. Diminish the heat after fifteen minutes. Iron molds are better than tin. The small size, about three inches in length, and one and a half in width, is better than the larger sizes. The proportions of water and meal in this formula are for white wheat. For red wheat a little more meal is necessary. One-sixth corn meal is an improvement, in which case it needs a heaping measure of meal to the water.

OAT MEAL AND GRAHAM GEMS.—Mix equal parts of fine Irish oat meal and Graham flour into a thick batter with milk and water equal parts, fill hot gem irons and bake with a brisk heat. Very sweet and tender.

WHEAT MEAL ROLLS.—Pour boiling water on unbolted wheat meal, stirring rapidly with a strong spoon or stick. The dough should be scarcely stiff enough to retain its shape. Of this take portions about the size of a hen’s egg, and roll it into a round form three or four inches in length; a plenty of dry flour to prevent sticking. Bake at once. The coating of flour also prevents the *escape of air*

from the dough, as the sudden heat of baking expands it, thus making the rolls much lighter. Let bake in a very hot oven.

SNOW CAKES OR BREAD.—First cool a wooden bowl, in this put the desired quantity of corn or unbolted wheat meal, mix with this twice or three times as much snow. It now appears like dry meal. Put some on a hot griddle; if too dry to turn well add more snow; if too wet to be light add more meal; when *just right* bake the same as batter cakes, or put it in a pan, about two inches deep—rounding it *from* the edge—and bake in a quick oven twenty minutes.

CORN CAKES.—Pour hot water on to corn meal to make a stiff batter; let it stand over night. In the morning add milk to thin it, then stir in Graham flour, in which is a little baking powder, until it is the right consistence for baking. Bake in gem pans, and they will be light and nice, with a very small proportion of yeast powder.

CORN MEAL BREAKFAST CAKE.—For two baking tins take one and a half pints of coarsely ground corn meal. Add water nearly boiling, but not enough to wet quite all of the corn meal; add cold water, a little at a time, stirring thoroughly between whiles, until you have it so thin that it has a tendency to settle as you pour it into your pie tins. It should not be more than half an inch deep in the tins, and it should bake quickly in a hot oven.

CORN CAKE, WITH FRUIT.—Pour one quart boiling water on one quart corn meal, and stir quickly. Wet the hands, and form the dough into small round cakes one-half an inch thick. Bake in a hot oven. The addition of a few raspberries, huckleberries, or any other sub-acid fruit, is a decided improvement. Sweet apples, chopped fine, are also excellent.

CORN AND RYE BISCUITS.—Pour boiling water on coarse yellow corn meal, and stir to the consistency of a thick batter. Immediately add coarse rye meal to make into a very soft dough; form into small, flat biscuits (fifteen to a baking pan) with the hands frequently wet in cold water, and bake immediately in a hot oven. They are very nice for variety, and are best made of equal parts of corn and rye. Bake thirty minutes or more.

WHEAT MEAL CRISPS.—Wet unbolted wheat meal with boiling water, and form a stiff dough. Grease, or sprinkle flour on a nice sheet of iron—the bottom of a smooth sheet-iron pan would answer—on this roll out the dough as thin as possible, mark into convenient squares, and bake in a slow oven. When rightly baked they will not curl or blister. Invalids with the poorest teeth, whose state of health may require dry food, can eat them.

WHEAT MEAL BISCUITS.—Pour boiling soft water upon coarse white-wheat meal, stir with a spoon to a dough as soft as it can be managed, by the exercise of skill, upon a molding board. Roll to an inch in thickness, cut with a biscuit cutter, prick and bake immediately in an oven hotter than is necessary for the two preceding. It

will take half an hour to bake. If made of red wheat it must be stiffer and baked longer.

GOOD UNLEAVENED BREAD.—Take half the flour you intend using, and pour on boiling milk (be sure it boils); have it about the consistency of batter that you would have for making pancakes; let this stand till cool enough to work; then knead in the rest of your flour, just sufficiently stiff to mold on a board. One hour in a middling hot oven is sufficient for baking.

DR. JENKINS'S GRAHAM CRACKERS.—Procure the whitest and cleanest wheat (Canada wheat is best), have the crackers made by a baker. Mix with nothing but pure, soft water, and thoroughly reduce the mass in a baker's break, as for making other crackers. Have them rolled very thin, no more than half as thick as soda crackers, cut in the form and the size of soda crackers, and bake quickly until a pale yellow. These will keep six months if placed in a dry, cool, sweet store room. They are fresher and more tender to place them in a hot oven a few moments before bringing them to the table.

GRAHAM CRACKERS.—Wet the best of Graham flour with cold milk, adding about a fifth proportion of thick cream, or a little butter if cream is not to be had. Mix as soft as can be handled; knead very thoroughly, say fifteen or twenty minutes; roll thin; cut in three-inch-square cards; lay, so they will not touch each other, on a hot sheet-iron pan, and bake quickly, say ten to fifteen or twenty minutes, according to thickness. Handle carefully while hot, and pack away, when cold, in tin cans or stone jars in a cool, dry place.

APPLE-CORN PONE.—Pare and chop fine a quart of sweet apples. Scald a quart of corn meal with a pint of boiling water; add new milk enough to make a stiff batter, then stir in the apples. Bake slowly in a close vessel three hours. Butter the dish well. This is very nice, boiled the same length of time in a pudding-mold or bag. But it is never so good as when baked in an old-fashioned kettle with a close-fitting lid, with live coals from the fire heaped on top and under the kettle. The thick brown crusts are delicious, with cream or milk.

STEAMED BROWN BREAD.—One quart of rye meal, one pint of Indian meal, one cup of molasses, one teaspoonful of sifted cream yeast stirred in the molasses, a little salt. Stir soft with cold water, steam three hours, and dry off in the oven fifteen minutes.

BROWN BREAD.—The sweetest bread ever made.—Take three pints of coarse yellow corn meal, scald it with three pints and a half of boiling water, add two pints of coarse rye meal after the corn has cooled. Knead thoroughly with the hands. Take it out into a stone-ware crock, or pot, which is a little larger at the top. The quantity here given will take a vessel which holds five or six quarts. Place it immediately in the oven after smoothing over the top with a spoon frequently dipped in cold water. Cover with a stone or iron plate, and have but little heat in the oven. It should take three hours to begin to bake, then bake slowly four hours. Leave the loaf in until the

oven cools off, if it is several hours longer. It should be dark-colored, light and firm, with a good soft crust. A round-bottomed iron kettle will do to bake in. Try it.

YANKEE BROWN BREAD.—Take equal quantities of rye and corn meal, and mix with water, making a dough that can be kneaded. Work with the hands until it loses its stickiness, and will readily cleave from the fingers. Let it stand several hours, or over night, and bake in loaves, in covered dishes, in a moderate oven, from three to five hours. Or, it may be steamed three hours, and baked one. Coarsely ground meal is better than fine for this kind of bread.

APPLE BROWN BREAD.—Work equal parts of corn and rye meal into stewed apples until the entire mass is thoroughly mixed, and bake as above. Or, thin with water to a batter, and bake on the griddle.

HOW TO MAKE OAT MEAL CAKES.—The *Rural Cyclopedia*, published at Edinburgh, Scotland, gives the following receipt for making oat meal cakes. Well made they are delicious.

“As much meal as will make a sheet 24 or 30 inches in diameter and one-eighth of an inch in thickness, is put into a wooden basin, with a sufficiency of water for working the meal into a light paste. The meal and water are mixed by the fingers of the right hand, while the basin is turned constantly round by the left hand, till the paste is made; the paste is then turned out on a clean board, or table, and alternately kneaded with the knuckles of both hands, sprinkled with meal, gathered up, kneaded and sprinkled, and kneaded again and again, till it becomes a well kneaded and homogeneous dough; the dough is then flattened out with the knuckles into a circular cake of half an inch, or less, in thickness, and immediately afterward distended with a roller into a sheet of about one-eighth of an inch in thickness; and the sheet is then pared round the edges and cut into three or four parts from the centre with a knife. The parts of the cut sheet of dough are fired, or half baked, first on the one side and then on the other, upon a thin circular plate of iron, called a griddle or girdle; and then they are toasted, or whole baked, by being placed on their edge on a toaster close before the fire, with first the one side and then the other exposed to the heat. Some butter is sometimes mixed with the paste, to render the cakes ‘fresh’ and highly relishable, and occasionally a few caraway seeds also are added, but in the estimation of racy, unsophisticated cake-eaters, all such admixtures are an abomination.”

A Scotchman writing to the *New York Observer* in reference to these cakes and oat meal generally, says:

“The favorite accompaniment to this is sweet milk, dipped with the spoon (which has previously taken up and contains a portion of the porridge) out of a separate dish from the porridge.”

OAT MEAL BREAKFAST CAKES.—This is made of No. 2 oat meal, with water enough to saturate it, and little or no salt. Pour it into a baking tin half an inch or three-quarters deep, shake it down level, and when this is done it should be so wet that two or three spoonful of water should run freely on the surface. Put it in a quick over

and bake twenty minutes. Eat warm. It will be as light and tender as the best "Johnny cake," or else you have wet it too much or baked it too long. This is one of the most accommodating baked dishes that can be made. It will do very nicely with a little longer time if the oven is not quite hot. If it will not bake there at all, pour it into a frying pan, cover it close and set it on the top of the stove, where it will even bake in fifteen minutes.

For a hurried breakfast and a slow coal fire it is invaluable. Scarcely any wholesome thing in the whole bread line can be prepared more readily. It can be made still thinner and baked quicker. It is good either crisp or moist. For emergencies alone every housekeeper will find it convenient to be able to make the breakfast cake. Many use oat meal mixed with buckwheat, wheat or corn, for griddle cakes. For this use I prefer it cooked first. Take, say one-half pint of the porridge or the mush, diffuse it in one quart of water, and add the wheat meal, sifting it in and stirring slowly.

OAT MEAL CAKE.—Take one pint of oatmeal, and just warm water enough to stir up a batter like griddle cakes. Pour it into a shallow baking pan, and bake for twenty minutes in a hot oven. Or, if preferable, bake it in small cakes on the griddle, first putting in a handful of wheat flour and a little more water. The cold porridge will also make delicious griddle cakes.

CREAM TOAST.—Boil a pint and a half of cream or new milk and thicken with a tablespoonful of flour or corn starch, add a little salt. Toast slices of stale bread quickly, of an even brown on both sides, lay them in the toast dish and dip over them a plentiful supply of the hot thickened cream; add another layer of toast and then more cream.

ANOTHER WAY.—Cut smooth slices of stale bread less than half an inch thick, toast a delicate brown, put the plate into the oven and heat it quite warm, lay the toast into the plate and pour over it cold, sweet cream, and the toast is ready to be eaten. For invalids and children with dainty appetites, this is very nice and easily digested. Some light fruit jelly will add to the relish and still be wholesome.

NORWEGIAN OAT MEAL PORRIDGE.—Take two or three handfuls of meal, mixed, coarse and fine, in proportion of one-third latter to two of the former. Mix in a basin of cold water and pour into a pan containing about a quart of boiling water, adding a small portion of salt. Set on the fire, and keep stirring, adding from time to time small doses of meal until it boils and has acquired a proper consistency; which may be known by its glutinous state, as it drops from the spoon. Let it simmer ten minutes, then pour into common dinner plates. Spoon out portions and float in new milk, adding sugar to taste.

OAT MEAL CRACKNELS.—Take the finest quality of oatmeal, and stir in barley water enough to wet it through; let it stand twenty minutes to swell then roll it out to a quarter of an inch in thickness, first flouring the board and rolling pin with wheat flour. Cut it with a biscuit cutter and bake in a moderately hot oven, as these cakes

will burn quickly, and only require to be of the slightest brown. They will snap easily between the fingers, and are delicious, requiring no butter to make them palatable. If put into a close jar they will keep for several months. In the Highlands of Scotland they preserve their cracknels, or bannocks, as they call them, in the barrels of oatmeal for a year or so.

Another way to make cracknels, is to mix oatmeal to a stiff batter with cold water, and let it stand several hours. Or mix with sweet milk and let it stand until it swells (do not let it sour), then pour it into bake pans and bake twenty minutes. They should be one-fourth of an inch thick and a light brown color when done.

OAT MEAL AND COCOANUT CRACKNELS.—Oatmeal mixed with grated cocoanut produces a very attractive cake to both old and young. Take three heaping tablespoonfuls of grated cocoanut, or two of the prepared "dessicated" cocoanut; add to it half a pint of the finest oatmeal and two heaping tablespoonfuls of sugar; stir it into one gill of boiling water, and mix it thoroughly together; turn out on the rolling board, well floured, and roll it as thin and cut out as for common cracknels, put a bit of citron and half a dozen currants into each cake, sticking them into the dough. Bake in a slow oven and watch carefully lest they brown a shade too deep. To make them crispy let them stand a day in an uncovered dish. A very palatable pie crust can be made from the dough of oatmeal cracknels by wetting it a little thinner; or in preparing it, add just half the measure of meal in hot water. Add no butter or lard, simply a little salt; roll out thin, and make the pie of cooked fruits, as this kind of paste bakes very quickly, and if the fruit requires cooking it would become too hard and brown. Most persons who eschew all kinds of pies can eat those made of oatmeal without fear or trembling, and they will soon learn to consider oatmeal an invaluable addition to their tables.

ONION TOAST.—Boil some onions of moderate size; change the water twice in boiling; salt in the last water. When nicely done take out with a skimmer. Make a gravy such as you make for cream toast. Toast slices of bread, lay them in a dish, put the onions on the slices, one on a slice, and pour the gravy over both.

Note.—The onions will cook in half the time if you cut them into three or four slices before you put them into the water.

EGG TOAST.—Break the eggs carefully into water boiling hot, but not really boiling. Let them simmer till they are delicately cooked or till the yolks are covered with a white film, then take up with a skimmer and lay on slices of buttered or cream toast. Salt the water in which the eggs are boiled, and see that it covers the eggs. Butter and pepper may be added on the table.

TO COOK EGGS.

BOILED EGGS.—Boil three minutes by the watch, and you have the central or yellow part soft boiled, while the white is hard, unpalatable and difficult of digestion.

Place the eggs in water "milkwarm," or a little warmer. In four or five minutes pour off the water, and immediately pour on boiling water to cover the eggs, and in five minutes they will be cooked.

If boiling water is poured on cold eggs in a cold dish, it will be so suddenly cooled that the eggs will not be cooked, but treat them as above directed, and you will find them thoroughly cooked, yet soft and palatable.

THE QUEEN'S OMELET.—Place in the frying pan about one ounce of butter. Break three eggs, separately, to see they are fresh; beat them up with a little chopped parsley and a pinch of pepper and salt. The eggs should not be beaten too much, or the white of them separates, and you produce a watery mixture which destroys the flavor and appearance of the omelet. Now the butter is melted, pour in the frying pan the omelet mixture and stir till it begins to set or thicken, shake the pan occasionally, and fold over the omelet neatly into an oval shape, and when it is of a golden color turn quickly into a dish. To be able to prepare a plain omelet is to be able to prepare every kind of omelet. If you require a cheese omelet, introduce into the omelet mixture about a dessert spoonful of grated cheese, with a little pepper and salt, and sometimes a few grains of cayenne pepper. In a sweet omelet no pepper or salt, but a little grated sugar; and just before the omelet is folded in the pan distribute evenly over a little jam. In preparing an omelet, remember five things—a clean pan; the mixture must not be too much beaten; the omelet must not be too large; three eggs are better than six eggs, which make two omelets; they should not be too much cooked; they should be eaten immediately, or they become tough, and more like a pancake.

DROPPED EGGS.—Have ready a saucepan of *boiling* water. Drop fresh eggs carefully into the water so as not to break the yolks. Let them stand where they will keep hot, but not boil, until the white sets. Toast slices of bread and lay in a dish, and pour over it a gill of hot cream with a little salt; then take out the eggs with an egg-slice or tablespoon, and put on to the bread with parsley, if you like.

BAKED OMELET.—Boil half a pint of cream, or rich milk; beat six eggs thoroughly—they will be nicer if the whites and yolks are beaten separately; have a deep dish hot and buttered; stir the beaten eggs, with a little salt, into the cream; put all quickly into the dish, and bake from five to ten minutes, depending upon the condition of the oven. It should be lightly browned, and taken directly to the table in the dish.

SCRAMBLED EGGS.—Have a spider hot and buttered. Break as many eggs as you wish to cook into a dish, being careful not to break the yolks. Slip the eggs into the spider, sprinkle over a very little salt, and add a lump of butter the size of a nutmeg for half a dozen eggs, or three tablespoonfuls of rich cream. When the eggs begin to whiten, stir them carefully from the bottom, until cooked to suit. The yolks and whites should separate, though stirred together. Care should be taken not to have the spider too hot.

BAKED EGGS.—Take a common white dish with a smooth bottom, and large enough to hold the eggs you wish to cook ; *do not crowd* them. Set the dish into the oven till quite hot, then butter it ; have the eggs broken, and slip them carefully into the dish ; sprinkle a little salt over them, and put directly into a quick oven and bake three or five minutes. Butter and pepper may be added, if desired, when they are cooked. A tablespoonful of cream to two eggs, when they are first set to bake, is nice.

PREPARATIONS OF CHEESE.

CHEESE AND BREAD TOAST.—Grate half a cup of good cheese—use your crumbs and dry pieces—mix with it one cup of grated bread and the yolk of one egg, half a spoonful of butter, and three spoonfuls of rich cream. Add a salt spoonful of salt, and a sprinkle of cayenne and mustard if desired. Toast two or three slices of bread, spread the cheese mixture on quite thick, put into the oven a minute or two, and send to the table hot. Or lay on a top slice, and make a sandwich. Take a sharp knife and cut into four pieces.

COTTAGE CHEESE.—This is a farmer's dish, but should and would be eaten and appreciated by all classes if they knew how wholesome and digestible it is. Those who have plenty of milk and make butter, have an abundance of sour or clabbered milk daily, clean and fresh. Skim the cream off for the churn, and set a gallon or two of the milk on the stove in a milk pan, and let it gradually warm till it is luke-warm all through. Stir it occasionally to prevent its hardening at the bottom, and when it is a little warmer than new milk, and the whey begins to show clear around the curd, pour it all into a coarse thin bag, tie close, and hang up to strain. Let it hang two or three hours in a cool, shady place, then take from the bag and put in a covered dish. When preparing the rest of a meal, mix with the curd rich sweet cream, sugar, and nutmeg. Some prefer salt and pepper, but the sugar gives it the place of fruits or acids. This preparation of milk will often be found most salutary and wholesome for dyspeptics and weak inflamed stomachs. The clabber is also very nutritious and easily digested.

SANDWICHES.

SANDWICHES are very useful to put in your bag or your pocket when you are not likely to be able to procure your usual meal.

CHEESE SANDWICHES.—Take two-thirds of good cheese, grated, and one-third of butter ; add a little cream ; pound all together in a mortar ; then spread it on slices of brown bread or gems ; lay another slice over each ; press them gently together, and cut in small square pieces.

EGG SANDWICHES.—Boil fresh eggs five minutes ; put them in cold water, and when quite cold peel them, and after taking a little of the white off each end of the eggs, cut the remainder in four slices. Lay them between bread and butter.

FRIED EGG SANDWICHES.—Beat some eggs well; fry them in butter as a pancake. When cold, cut in small square pieces, and lay them between brown bread and butter.

OMELET SANDWICHES.—Take four eggs, two tablespoonfuls of bread crumbs, and one half ounce of chopped parsley. After beating the eggs well, add the bread crumbs, then the parsley, and two tablespoonfuls of water. Season, and fry it in small fritters, and when cold put them between brown bread and butter.

VEGETABLES.

All green vegetables should be as fresh as possible. Put them into cold water with some salt in it, for about ten minutes, to clear from soil or insects. If not quite fresh, let them remain in the water some time longer; drain in a colander, and put them into a pan with plenty of boiling water, adding salt, and a small piece of soda; cover the pan till boiling, but not afterward; then boil quickly, and carefully remove any scum which may rise. Do not allow them to remain in the water after they are done, but immediately drain them in a colander, and finish each kind, as directed in recipes. Peas and spinach do not require so much water as most other green vegetables, but only just sufficient to cover them. Cauliflowers and brocoli require especial care in boiling, as the flower is easily broken and their appearance spoiled; boil them quickly for a few minutes, and then moderately till tender, which may be easily ascertained by trying the stem with a fork. All vessels used in cooking vegetables should be particularly clean. Soft is preferable to hard water in cooking all kinds of vegetables. Potatoes are in universal use, and yet how few know how to cook them well! “A well-boiled potato is a thing purely ideal—it has never come out of the pot, in the experience of living man.” This is too strong; but there is very much room for, and need of, improvement in the *science of cooking a potato*. To do it *well*, the matter must be *studied*, and not performed by routine. They differ very much, even those grown in the same field and from the same seed. A good potato, well cooked and served up, is a luxury, which, unfortunately, few people know how to accomplish, or will not give themselves the trouble to do.

POTATOES.—Those grown on virgin soil, of a middle size, and floury, are to be preferred. They should be as nearly as possible of one size, well washed, but not pared. They should be put into a vessel of cold water for an hour, then put into fresh water, and boiled in a kettle or saucepan, closely covered, in the most expeditious manner possible; or they should be steamed, which would be still better. If boiled, no more water should be used than merely to cover them, as they produce a considerable quantity of fluid. When they are done, the water should be instantly poured off, and the kettle containing the cooked potatoes be placed on the side of the fire with a cover on, and a cloth over them, until the steam is absorbed, and rendered quite dry and mealy before they are sent to the table.

BAKED POTATOES.—Have a hot baking oven, select and wash potatoes of uniform size, and put them moist into a clean oven. Do not

open the oven if you can avoid it for half an hour ; try if they are done in a towel. Eat them hot.

POTATO BALLS.—(For Breakfast).—Boil and mash a double quantity of potatoes for dinner, season with sweet cream and a little salt : work in two fresh eggs to a quart. Mold into little balls, prick the tops, and lay away in the cold on a plate. In the morning put on baking pan and set into the oven until done to a delicate brown, which requires fifteen or twenty minutes.

POTATOES are a standard article of food on most tables, but they are often so badly cooked that they are neither palatable nor wholesome. As a breakfast dish they are excellent. We like them prepared thus : Select the smaller ones—leaving the larger ones for dinner—scrape off the skins of new potatoes, put them into cold water for ten minutes, have water boiling, and cook them twenty minutes ; pour off the water and add a cup of milk or cream, and thicken it with a little flour and butter rubbed together. Butter never floats on the surface when mixed with flour thus, nor does the flour trouble you with lumps. It is just as well, however, to leave out the butter, mixing the flour with a little cream.

POTATOES should always be put into *boiling* water to cook, boil quickly and pour off the water, letting them dry a few minutes over the fire before dishing up: Steaming is the best manner of cooking them.

MASHED POTATOES should be left in the kettle after draining and drying as above, and mashed thoroughly over the fire ; add a little milk or cream, and they will be light as a sponge and white as flour. Never put butter into them.

STEAM SQUASH.—Squash cooked in a steamer over a little water is much nicer than when boiled. I never boil squash. It may be cut in large pieces and cooked in a kettle with a small steamer in the bottom and half a pint of water ; fill the kettle with squash and keep closely covered till well cooked, taking care not to let it burn. A very hot fire is not so good for cooking as a slow, moderate heat. May be placed on the table warm or cold, mashed or not, as preferred.

Many kinds of squash, especially late and winter squashes, are better baked than any other way—they are quite equal to sweet potatoes when baked in a close kettle so as to partly steam them. Cut in slices three quarters of an inch thick.

RAW TOMATOES.—The simplest and one of the most wholesome modes of preparing tomatoes is to remove the skins by scalding, cut them in slices and season to the taste. To *our* taste powdered loaf sugar makes the best seasoning. The tomatoes should be solid, like the Trophy, and perfectly ripe. As a substitute for fruit, they answer a good purpose, especially the yellow and white varieties

STEWED TOMATOES.—Let the tomatoes be well ripened, scald them and remove the skins, cut into small pieces, put into a saucepan, with a little salt and butter, and cook till well done, but no longer. Pepper may be added if agreeable. As a substitute for fruit, omit the pep-

per and sweeten to the taste with white sugar. In this case Dixie and White Apple tomatoes are best, as they have a decidedly fruity flavor.

BROILED TOMATOES.—First raise your tomato. If not quite ripe, no matter; cut in two flat-wise; put it skin down, on a hot iron and in a few minutes (seasoned to your taste) you have a dish that is pretty, wholesome and delicious—tomatoes on the half shell.

We have tried it. Those who have not, do not yet know how exquisite a morsel the tomato is capable of being made. With a little pepper and salt, or, better still, with butter and sugar, broiled tomatoes furnish a dish fit for the gods.

NOTE.—This manner of preparing tomatoes is indeed excellent. We toast slices of bread nice and brown, butter them a little, and lay on to them the broiled tomatoes; put half a teacupful of cream into the dish around the toast, and set it into the oven a few minutes before taking to the table.

TOMATOES should be sliced and boiled in their own juice without water. They should boil briskly. Twenty minutes suffices for a quart. If boiled much longer it injures their peculiar flavor. Season when ready to take up.

BAKED TOMATOES.—One quart of fresh round tomatoes. Scald and peel carefully, so as not to break the tomato; put into a deep dish, and season with a little salt and cayenne. Roll a teacupful of crackers and spread over the top; cover lightly, and bake in a quick oven half or three quarters of an hour. Two or three lumps of butter, the size of a Lima bean, may be dropped into the dish just before dishing up. Slip them out carefully, the brown side up, or leave them in the baking dish.

SCALLOPED TOMATOES.—Peel as many large ripe tomatoes as you wish to prepare; cut them into slices a quarter of an inch thick. Pack in a pudding dish first a layer of tomatoes, then a thick layer of bread crumbs, salt, and a little white sugar and butter, then a layer of tomatoes, then bread crumbs, etc., till the dish is nearly full, having tomatoes last. Now dust over pepper, a little sugar and butter, strew the top with bread crumbs, and bake (*covered*) half an hour; then remove the cover and bake brown, but be careful not to scorch.

CORN OYSTERS.—One quart of grated corn, three eggs well beaten, half a teaspoonful of salt, with flour enough to make them stick together. Drop from a spoon into a hot buttered frying pan, making cakes the size of an oyster. A cup of sour milk, with half a teaspoonful of soda, will answer if eggs are not plenty.

GREEN CORN ON THE COB.—Remove the husks and silk from full-grown ears of corn in which the milk is well developed. Put them into sufficient boiling water to cover. Boil gently in a covered kettle from twenty to thirty minutes, according to the age of the corn. It is better cooked by steam for half an hour. Corn which requires more than half an hour to cook is not good.

CORN WHEN CUT FROM THE COB.—Split the kernels of corn before removing from the cob, and in cutting off cut them several times through, leaving a large part on the cob to be scraped off, so as to

make a fine mass of the whole. Take a pint of milk or cream, bring it to a boil, and put the corn in and boil slowly in a closed porcelain or tin vessel for fifteen or twenty minutes with a very little salt ; or, which is better, steam it for half an hour. It will then be very rich and savory.

SUCCOTASH.—For succotash, Lima beans are the best ; the Agricultural stand second on the list. But any good variety of bush beans, which come earlier than these, makes an article by no means inferior. Shell the green beans, and boil them slowly in an abundance of water for one or two hours, being careful to keep them covered with water while boiling. Cut well-grown corn from the cob, as in the previous directions ; place it in a pan or basin to steam, over the beans—if not provided with suitable steam apparatus. Add a little water to the corn, and stir it occasionally. Steam from twenty to thirty minutes, then add the corn to the beans, and simmer for half an hour. Stir often, and watch carefully that it does not burn. Season to suit the taste.

DRIED SWEET CORN.—Wash the quantity you wish to cook. Add two or three times as much water, and soak over night. In the morning place on the range or stove in a closed tin or porcelain vessel, where it will keep at the scalding point for four or five hours. Do not let it boil a moment. Be equally careful to keep it hot. Add water, if necessary, but do not make it too thick. Season as you like with salt.

WINTER SUCCOTASH.—Take equal quantities of dried sweet corn and of dried green beans. Wash and soak them separately, over night, in warm water. Add more water, if necessary, in the morning. Boil the beans slowly for four or five hours, adding boiling water occasionally. Cook the corn as you would without the beans. Then add the corn to the beans, and cook slowly, only long enough to combine them well. This is an excellent article of food, if carefully prepared, although not equal to succotash in the summer. Season with cream and salt.

TO BAKE BEANS.—Prepare them as for stewing, and place them with a large quantity of water in a stone-ware pot in a hot oven. Let the oven cool somewhat after they begin to cook, and bake them from four to six hours rather slowly. Leave out meat and butter, and trim with cream and salt.

DRIED GREEN PEAS.—Wash the peas, pour boiling soft water over them, sufficient to cover. Let them stand over night. Stew them for several hours, or until they are soft and pulpy. Add boiling water occasionally, and keep them covered closely while cooking. Add half a cup of cream and a little salt, and boil ten minutes ; then dish up.

STEWED CARROTS.—One pound and a half of carrots ; one ounce of butter ; quarter of an ounce of parsley ; one teaspoonful of flour, and four tablespoonfuls of cream. About half-boil the carrots, then scrape and slice them ; put them into a pan with half a teacupful of vegetable broth, or water ; let them simmer till quite tender, but not

broken ; add the chopped parsley, and stir in the flour and butter previously mixed ; simmer them ten minutes longer, and serve immediately.

GREEN PEAS.—The most important part is to get the peas fresh from the vines. They lose their delicious flavor in a very short time after picking. Wash before shelling, not after. Shell the peas, then select the tenderest pods, and put into just water enough to cover them, and after boiling them ten or fifteen minutes, skim out the pods and put in the peas. Boil them slowly twenty minutes, trim with a little rich cream, and salt. They should be boiled in so little water that there will not be more than a half teacupful around them when they are cooked, and this should be seasoned and dished with the peas. Those who must depend upon the markets for peas often find them very insipid and tasteless, notwithstanding their care in selecting and cooking. Sometimes a spoonful of sugar will add to the flavor. Boiling the pods adds much to the richness and sweetness of the peas.

ASPARAGUS.—Select green asparagus. If you have the privilege of cutting it from the bed, break or cut as close to the ground as it is tender. If you must buy from the markets, try several stalks and see that they are not woody and tough. The white ends are usually so, and are not eatable, being very bitter besides. After breaking off the hardest part, the asparagus may be improved by taking a thin sharp knife and stripping off the outside skin, beginning at the cut end and drawing the skin upward as far as it will go. The bitter lies next to the outside. Now cut the stalks into pieces an inch long, put into a saucepan, sprinkle over a little salt, and just cover with boiling water. Cook twenty minutes ; add half a teacupful of sweet cream ; rub together a teaspoonful of butter and a teaspoonful of flour and stir in ; boil up a minute or two ; toast a thin slice of bread a light brown ; cut into several pieces ; lay into the bottom of a dish, and pour the asparagus over. Or leave the asparagus without cutting up, lay it all one way in the saucepan, and otherwise prepare the same.

SHELLED BEANS.—Of the shelling beans the Lima, Horticultural, and Saba are the best. They require a full hour to boil, and a large quantity of water, as there appears to be a more rapid evaporation when beans are boiling than with most vegetables. When ready to dish, season as other vegetables. Much seasoning destroys or covers up the delicious taste of the bean. A little rich cream and salt is sufficient.

STRING BEANS should be strung, broken in pieces, and boiled an hour or two, and seasoned the same as shelled beans.

BOILED CABBAGE.—Take off the outside leaves—all that are green or imperfect—from a head of white cabbage ; cut into quarters, and lay it for a few minutes into a panful of cold salted water. This will at once remove slugs or insects. Open the leaves, but do not break them from the stem. Shake them in the water and examine carefully, then put into a kettle containing at least three quarts of fast boiling water. Cover the kettle and boil fast for three quarters of an hour

Boil a tea-cupful of rich milk or cream, thicken with a spoonful of flour, and pour over the cabbage, which has been taken up into a vegetable dish and all the water drained off. Add a little salt and a sprinkle of cayenne.

CABBAGE WITH MILK.—Cut half of a solid head of cabbage fine as for slaw. Have a deep spider on the fire and hot. Put in your cabbage, pour quickly over it a pint of boiling water, cover close, and cook for ten minutes; then pour off the water that remains, and add half a pint of rich milk. When the milk boils up stir in a tea-spoonful of flour moistened with a little cream or milk, a sprinkle of salt, and cook the flour a minute, then dish up.

Those who usually find cabbage an unpleasantly indigestible article of food will be gratified with the result of this mode of cooking it. It is quite like cauliflower, and is much cheaper.

DR. EVERETT'S CHOICE.—Cut fine as much clean nice cabbage as will fill a spider. Place it in this utensil, cover with a plate, and let it cook till done in the steam from its own juices.

ONIONS.—The unpleasant breath which eating this vegetable produces is perhaps the greatest objection to its use, but still it is a very wholesome and desirable article of food for many, and hence should be brought on the table in the most attractive form. White onions, and those grown in the South, are least odorous and pungent. Take off the outside skin, cut off both ends close, and let them stand in cold water an hour, then drop them into a saucepan with two quarts of boiling water. Cover, and boil fifteen minutes. Have a kettle of boiling water on the fire ready for use, pour off the water from the onions, and add as much more—be sure the water is boiling—and boil half an hour longer. Scald a cupful of rich milk, pour off the second water from the onions, add the milk and a little Graham flour to thicken it. Salt and otherwise season to taste. Boil up a few minutes and serve the onions whole; or they may be cut in halves before cooking.

COLD SLAW.—Take half a head of white cabbage, cut it into fine shreds, and put into a bowl or deep dish. Add the juice of a large lemon and two spoonfuls of cold water, and stir together; then sift evenly over the cabbage three or four table-spoonfuls of granulated sugar; shake the dish so that the sugar may be diffused, but do not stir it again. Let it stand ten or fifteen minutes and then serve.

Grape or currant vinegar is very nice instead of lemon, and a preferable acid with many.

POTATO SALAD.—Cut six or eight cold potatoes into even, thin slices, and put into a salad dish. Cut fine, and sprinkle over the potatoes a tea-spoonful of parsley, and a little salt and cayenne. Stir half a tea-cupful of good cream until it is very smooth and foamy; pour over the potatoes, and mix carefully, so as not to break the slices. A little prepared mustard, and a few stalks of white celery chopped fine, is an addition. This is a good dish for a hearty lunch.

SWEET POTATOES may be peeled, cut in thin slices or strips, and fried, heating and buttering the skillet in the same way. They will not bear quite so hot a fire, nor take so long to cook. Use as little butter as possible. Fried food is not considered so wholesome as boiled or steamed, but is sometimes more convenient to prepare.

EGG PLANT.—Pare and cut into slices, half an inch thick, two or three egg plants, according to the size of your family, and put to soak in cold salted water for two hours. This removes a black, bitter juice, said to be unhealthful, certainly very disagreeable. Then press the slices between two plates, and wipe them on a clean cloth, then boil till soft enough to mash like turnips. Mash them smooth, add a few bread crumbs soaked in sweet cream, a little chopped parsley and salt, and a sprinkle of cayenne. Mix all thoroughly, pour into a buttered baking dish, cover the top with bread crumbs, and bake half an hour.

CAULIFLOWER.—Soak the head two hours in cold salted water, and boil till tender in plenty of water. Have the water boiling when you put in the flower. Pour off the water, and add a cup of cream or milk. Rub together a tea-spoonful of butter and a large spoonful of flour. Stir into the milk, season as you like, and let all boil up together for five minutes and serve.

SPINACH.—Wash carefully in plenty of cold salt and water, put it into a saucepan that will just hold it, put in some salt, and pour over it a pint of boiling water. Cover close, and let it cook slowly twenty minutes. Drain off all the water, and pour over it a gill of scalded cream or a little butter, and it is ready for the table.

PIES.

PIES are wholesome or not as they are well or badly made. An apple pie can be so prepared as to be nearly or quite as simple as bread, butter, and apple sauce. A whole meal may be made of it without injury to the health. On the other hand, it may be so prepared as to be unfit for the stomach of even a rhinoceros. The model pie is in our opinion the apple pie. Peach pies are highly relished by many; but the peach loses its finest flavor by cooking, whereas the apple is improved by this process. Most of the berries in their season make good pies. So does rice and eggs, and the custard pie is not only delicious but wholesome. Meat mince pies are not to be tolerated by delicate people; though they may be eaten by men of strong digestion, who live much in the open air and do muscular work. The first point to be secured in a pie is good crust. In general terms, this should be thin and, when well baked, tender. It should not be shortened with lard, but the best of cream—or in the absence of this, good butter. Delicate fruits are soon tainted with the shortening of the crust. Many in baking pies, use too much crust. The less that can be used the better the pie will be. The crust should be thin, the fruit good pie-apples, and plenty of them, put between the crust. Where the two crusts meet on the edge of the dish, care should be taken to

have the apples pressed out, so that there shall not be a wide strip of thick crust with no apples near them. An apple pie should be eaten just after it is cool. If eaten while hot, it is apt to go down only half masticated, and the effect of the heat on the tongue tends to destroy the finer sense of taste. After an apple pie is one day old it begins to grow stale, unless it is kept with great care. Soyer, the famous London pie-maker, thinks that if all the spoilt pies made in London on one single Sunday were placed in a row beside a railway, it would take an express-train an hour to pass them in review. Whoever will induce bakers to improve their methods of making them, will be a public benefactor. The usual price for a piece of pie in a New York restaurant is ten cents. They could be afforded for half that price, at a profit, too, if there were no spoiled pies.

The following receipts for pie pastry will be found excellent. They may be varied somewhat to suit individual tastes, provided only the general rules be kept in view. We commend the cream shortening as better than any other.

GOOD PIE CRUST.—A quart of flour will make two large pies. Sift the flour. Take a large, strong spoon, and stir into the flour one quarter of a pound of butter and a tea-spoonful of yeast powder; then moisten with cold water—ice water if you have it—using just as little as will make the flour stick together. Sprinkle some of the shortened flour on the pie-board, and roll the crust large enough for the pie-pan; do not try to make smooth edges until you have put in the filling, and the upper crust; then press the edges firmly together and cut off the rough edges with a knife. The secret of good, tender, plain pastry is speedy work—no working with the warm hands.

CREAM AND POTATO PASTRY.—Six good-sized potatoes, boiled and mashed, mealy, and white, one tea-cup of sweet cream, half tea-spoonful of salt, and flour enough to make it stay together, and roll out. Work and handle as little as possible, and roll thicker than for common pastry.

This is MRS. BEECHER'S receipt for "pastry for *meat* pies," and is exactly what a wholesome fruit pie needs. Light tart apples, cut in thin slices, and filled into such a crust with a table-spoonful of water and two of sugar added, and a top-crust, baked half an hour, will be good enough for an epicure.

MRS. COX'S METHOD.—Pour sufficient boiling water upon wheat meal to make a stiff dough, roll, without kneading, to any desired thickness, from an eighth to a half inch.

NOTE.—This makes a very tender crust, quite as much so as can be made in the ordinary way. It may be made of superfine flour, or rye meal, or a mixture of different kinds.

To have the crust tender, it must not be kneaded, but rolled out with plenty of meal on the board.

MATTIE JONES' CREAM PIE CRUST.—Take equal quantities of Graham flour, white flour, and Indian meal; rub evenly together, and

wet with very thin sweet cream. It should be rolled thin and baked in an oven as hot as for common pie crust.

NOTE.—This makes excellent pastry if properly baked. Many patients have said to us they did not see how they could ever again relish the pastry in common use (this is so much sweeter and more palatable, to say nothing of its wholesomeness).

APPLE PIES.—Take nice, tart apples—spitzenbergs are best, although pippins, greenings, russets, etc., are excellent. Slice them; fill the under crust an inch thick; sprinkle sugar over them; add a spoonful or two of water; cover with a thin crust, and bake three-fourths of an hour in a moderate oven.

ANOTHER.—Peel and cut about two pounds of apples—sharp ones being the best for the purpose; cut each into four pieces, removing the cores; then cut each quarter into two or three pieces, according to the size. Put half of them into a pie-dish, slightly press them down; put over them two ounces of brown sugar; put in the remaining apples; then add another two ounces of sugar, making the apples form a kind of dome, the center being two inches higher than the sides; add a small wine-glass of water; cover the top with paste, and bake in a moderate oven from half to three-quarters of an hour.

MOCK APPLE PIE.—For a large pie-plate, two crackers (milk or soda), one egg, one cup of sugar, one of water, and the *juice* of one lemon; add a pinch of salt, and spice with nutmeg or the rind of the lemon. This is quite a tolerable counterfeit.

APPLE PUFFS.—Peel and core six tart apples, cook quickly with very little water; cover close so as to make them white and free from lumps; when done to a puff, sprinkle over them two heaping spoonfuls of sugar, and stir smooth. Set to cool. Prepare your pastry. Beat the whites of three eggs to a stiff froth, stir into the apples and fill the crust; grate a little nutmeg or cinnamon over the top. No top crust. Bake in a quick oven, only long enough to cook the pastry.

APPLE FLOAT.—A pint of stewed, well mashed apples; whites of three eggs, four large spoonfuls of sugar, beaten until stiff; then add the apples and beat all together until stiff enough to stand alone. Fill a deep dish with rich cream, boiled soft custard, and pile the float on top. This is excellent with other fruits in place of apples.

FRENCH APPLE TURNOVERS.—Eight large apples; eight ounces of sugar; two ounces of butter, and the rind of a lemon.

Prepare the apples as for a pie; put them into a saucepan with the sugar, butter, the rind of a lemon rubbed on a piece of sugar, and two table-spoonfuls of water; cover the pan, and set it over a slow fire, turning it occasionally till the apples are about half done, and pour them into a basin to cool. Roll out a piece of paste in a circular form, the eighth of an inch thick, and about the size of a dinner-plate; wet it round, and fasten a rolled cord of paste within an inch of the edge; put in the prepared apples, raising them in the center in the form of a dome; spread some apricot or orange marmalade over the surface, and cover the whole with another circular piece of paste, and press the edges together, or fold them over in the form of a cord. Spread

some beaten white of egg all over the top with a soft paste-brush ; then strew coarsely pounded or rough granite sugar over the entire surface, and bake lightly in a moderately hot oven.

JAM TURNOVERS.—Roll out some short paste about one-eighth of an inch thick ; cut it in pieces about four inches in length, and between two and three inches in breadth ; lay on each a little apple jam, or any other preserved fruit, without syrup ; turn the edges over, wetting them, as little as possible, with water ; press them lightly together, and also the ends ; lay them on tins, and bake in a moderately hot oven. Ice them very perfectly, and return them to the oven for a few minutes, or set them in a Dutch or American oven before the fire.

APPLE PIE CAKE.—Mix unbolted wheat with cold water, making a batter soft enough to nearly level itself. If shortening is desired, use sweet cream or butter. Fill a rather deep pie-plate about a third full of the batter, and sprinkle over a little sugar. Wash, quarter, and core tart apples, and place as many in the batter (skin side up) as it will hold. They may be pressed down and leveled with a stiff spoon. Over the top sprinkle some sugar, and bake till nicely brown.

This cake is both wholesome, nutritious, and delicious. Children and grown folks can eat of it freely without injury.

COCOA-NUT PIES.—Open the *eyes* of a cocoa-nut with a pointed knife or a gimlet, and pour out the milk into a cup ; then break the shell and take out the meat and grate it fine. Take the same weight of sugar and the grated nut and stir together ; beat four eggs, the whites and yolks separately, to a stiff foam ; mix one cup of cream, and the milk of the cocoa-nut with the sugar and nut, then add the eggs and a few drops of orange or lemon extract. Line deep pie-tins with a nice crust, fill them with the custard and bake carefully half an hour.

LEMON PIE.—For each peeled and grated lemon add one tea-cup of sugar, and one table-spoonful of corn-starch dissolved in cold water. Over this pour a tea-cup of boiling water.

Crust. One part white flour, one part Graham flour, one part corn-meal. Shorten it with butter or condensed milk, reduced one-third. Use two crusts.

The above recipe for lemon pie is used in our Institution, and has given perfect satisfaction.

ANOTHER RECIPE.—Take two lemons, two eggs, one cup of sugar, one cup of water, and one large table-spoonful of flour. After grating the peel, take off and throw away the white rind, and cut the lemon in small pieces, carefully picking out the seeds. After the under crust is laid in, sugar it well. Bake with two crusts. Lemon pie is not quite so easily managed by the stomach, and should be eaten more sparingly than apple pie.

PUMPKIN OR SQUASH PIE.—Cut the pumpkin into small pieces ; take out the seeds and inside, but do not pare it. It must be a well-grown and thoroughly ripened pumpkin, and not watery. Put the

pieces into a sauce-pan with only a few spoonfuls of water, not more than four; cover close and let it cook gently so as not to scorch, until the water has all evaporated, and the pumpkin has cooked quite dry and of a rich, dark, orange color. While hot, sift it through a coarse sieve. Season only as much as you are needing for the day. For one large pie, one egg, one table-spoonful of molasses, four table-spoonfuls of condensed milk, or enough of new milk to make it as thin as you wish; or, if you have it, half milk and half cream, instead of condensed milk. Sugar to suit the taste.

ANOTHER.—Select a pumpkin which has a deep, rich color, and firm, close texture. Stew and sift in the ordinary manner; add as much boiling milk as will make it about one-third thicker than for common pumpkin pie. Sweeten with equal quantities of sugar and molasses, and bake about one hour in a hot oven.

NOTE.—Those who will try this method will be surprised to find how delicious a pie can be made without eggs, ginger, or spices of any kind. The milk being turned boiling hot upon the pumpkin, causes it to swell in baking, so that it is as light and nice as though eggs had been used.

SQUASH PIE.—This is even superior to pumpkin, as it possesses a richer, sweeter flavor, and is far preferable. It is made in precisely the same manner as pumpkin pie.

SWEET POTATO PIE.—Boil and sift through a colander, nice, ripe, sweet potatoes, add boiling milk, and make the same as pumpkin pie.

SWEET APPLE PIE.—Pare mellow, sweet apples, and grate them upon a grater. A very large grater is necessary for this purpose. Then proceed as for pumpkin pie.

NOTE.—The four receipts last mentioned, are from Mrs. Jones' *Cook-book*, a work of which thousands have been sold, and which has been republished in England.

RICE PIE.—Take cold rice, cooked in milk; add sufficient cream to make quite thin; mash it with a wooden or silver spoon till free from lumps. Beat up four eggs very light—yolks and whites separately; sweeten to suit your taste, and pour in the eggs—the whites last; stir well; cover a deep custard or pumpkin pie-plate with pastry, pour in the rice, and bake, but not long enough to make the custard watery.

Rice pie should be made thick, and eaten when fresh, but not till after it is cold. Children are fond of it, and may be allowed as much as they wish.

CRANBERRY PIE.—Stew a few good, ripe, sweet apples, and add an equal quantity of cranberries. Cover a deep plate with a crust, and fill even full; roll the upper crust, and cut in strips half an inch wide and lay across the pie, leaving the spaces diamond-shaped, and bake.

STRAWBERRY PIE.—Place the under crust upon a deep plate, and the upper one—cut just the right size—on a flat tin or sheet-iron prick to prevent blistering, and bake. Fill the deep dish while hot with strawberries, and cover with the flat crust. If the fruit is rather hard, replace in the oven till heated; if quite ripe, the crust will steam them sufficiently.

Raspberry and blackberry pie may be made in the same manner. The flavor of these delicious berries, when quite ripe, is greatly injured by cooking; and they are also changed to a mass of little else than seeds and juice.

Ripe Berry Pies, generally, may be prepared as above, and baked till the fruit is cooked, which takes only a few minutes. This method is much better than baking the fruit with the crust, as the greater part of the juice is often lost before the crust is cooked.

BERRY TARTS. — Cover gem-pans with crust, as for little pies, and bake; when nearly done, fill up with berries and replace in the oven a few minutes.

NOTE. — The four receipts mentioned above, are from Mrs. Cox's *Hygiene Cook book*, a radical, but thoughtful little book of one hundred pages, which will repay a careful reading.

PIE FOR DYSPEPTICS.—Four table-spoonfuls of oatmeal, one pint of water; let stand a few hours, or till the meal is well swelled. Then add two large apples, pared and sliced, a little salt, one cup of sugar, one table-spoonful of flour. Mix all well together and bake in a buttered pie-dish; and you have a most delicious pie, which may be eaten with safety by the sick or well.

We might go on giving other receipts for pies; but trust to the ingenuity of the reader to get up her own methods, bearing in mind always the rule that they be healthfully made.

CUSTARDS.

ALMOND CUSTARDS.—One pint of milk; half a pint of cream; one ounce and a half of sweet almonds; five yolks and two whites of eggs, and four ounces of white sugar. Boil the milk and cream with a small stick of cinnamon; pour into a basin, and when cool, take out cinnamon; set the milk on a slow fire, adding the sugar, the eggs, well beaten, and the almonds, blanched and chopped fine; stir on the fire till thick, but do not allow it to boil; pour it into a jug or bowl, stirring it frequently till cold, and serve in custard glasses.

ARROWROOT CUSTARDS.—One ounce of arrowroot; three-quarters of a pint of milk, three ounces of sugar, and four eggs. Mix the arrowroot with a quarter of a pint of cold milk, adding the eggs, well beaten, the sugar, and a little almond-flavor; add half a pint of boiling milk, stirring constantly, and when cold, serve in custard glasses.

MILK CUSTARD.—One pint of new milk; one table-spoonful of flour; one table-spoonful of thick cream; cinnamon; almond-flavor, and sugar. Set the milk over the fire with a little cinnamon, stirring it till quite hot, but not allowing it to boil. Mix the cream and flour together; pour on the hot milk; stir well, adding the almond-flavor, and sugar. Bake lightly, without crust, in a moderate oven.

ANOTHER.—One quart of new milk; sugar, and one stick of cinnamon. Boil the cinnamon in a pan with the new milk; take the pan off the fire, and stir in the sugar. Bake in pie or pudding dishes,

lined with custard paste. The paste should be pricked with a fork, but not through to the dish, and partly baked before the custard is put in. Egg custard may be made in the same way, allowing five or six eggs, according to size, to a quart of new milk.

BAKED CUSTARDS.—One pint of cream ; four eggs ; cinnamon ; almond-flavor, and three ounces of sugar. Boil the cream with a piece of cinnamon ; pour it into a basin, and when cold, add the eggs, well beaten and strained, the sugar powdered, and a few drops of almond-flavor. Bake in small cups, in a cool oven.

PLAIN CUSTARDS.—The same, without any condiments. One quart of new milk ; the yolks of eight and the whites of four eggs ; five ounces of sugar ; quarter of a pint of cream ; the rind of a lemon, and a small stick of cinnamon. Boil the milk with the cinnamon, sugar, and the rind of the lemon, pared very thin ; when the milk has boiled a few minutes, pour it into a bowl ; beat the eggs, adding the cream, and mix well in the milk ; then strain the whole into the pan, and set it on a slow fire, stirring constantly till near boiling ; pour it into a jug, stirring it till nearly cold, and serve in custard glasses.

GOOSEBERRY CUSTARDS.—Three pints of green gooseberries ; quarter of a pound of sugar ; four eggs, and two table-spoonfuls of orange-flower water. Set the gooseberries in cold water over a slow fire, and simmer till soft ; then drain the water away, and rub them through a sieve ; to a pint of pulp add the eggs, the sugar, and orange-flower water ; set it over the fire, stirring constantly till it becomes thick, and when cold, serve in custard glasses.

LEMON CUSTARDS.—Eight eggs ; six ounces of sugar ; two lemons ; a tea-cupful of cream ; one pint of boiling water, and two table-spoonfuls of orange-flower water. Beat the yolks of the eggs till quite frothy ; pour on them the boiling water, stirring quickly all the time ; add the sugar, and the rind of the lemons, grated ; stir it over a slow fire, till thick, adding the cream, and orange-flower water ; when hot, stir in the lemon-juice ; pour it into a basin ; stir till nearly cold, and serve in custard glasses.

LEMON CUSTARDS.—One large lemon ; one quart of new milk ; quarter of a pound of white sugar, and seven eggs. Grate off the rind of the lemon ; put it with the sugar in the milk, and boil quarter of an hour ; strain, and let it remain till cool ; then stir in the eggs, well beaten and strained, leaving out three whites ; pour it into cups with half a tea-spoonful of fresh butter, melted, in each cup ; set them in water, and bake in a moderate oven ; color them when done, by holding a hot salamander over, and serve cold, with sugar sifted on the top.

RASPBERRY CUSTARDS.—One pint of cream ; three quarters of a pint of raspberry juice, and half a pound of white sugar. Boil the cream ; dissolve the sugar in the raspberry juice ; mix it with the boiling cream, stirring it till quite thick, and serve in custard glasses.

RICE CUSTARDS.—One ounce and a half of ground rice ; three ounces of loaf sugar, and one pint of new milk. Boil the rice in the milk,

adding the sugar, and a piece of cinnamon ; pour it into custard cups, in which a little fresh butter has been melted, and bake in a slow oven.

VANILLA CUSTARDS.—One stick of vanilla ; one pint and a half of new milk ; half a pint of cream ; quarter of a pound of white sugar, and seven yolks and four whites of eggs. Cut the vanilla into slips ; boil in the milk and cream quarter of an hour, adding the sugar ; strain, and let it remain till cool ; then stir in the eggs, well beaten ; pour it into cups with half a tea-spoonful of fresh butter, melted, in each cup ; set them in water ; bake in a moderate oven ; color them when done by holding a hot salamander over, and serve cold, with sugar sifted on the top.

WHITE CUSTARDS.—One pint of cream ; three ounces of sugar ; the whites of four eggs, and one table-spoonful of orange-flower water. Boil the cream with a blade of mace ; let it simmer for about five minutes ; then take it off the fire, and add the sugar ; beat the whites of the eggs to a complete froth ; put them into the cream ; set it on the fire again, and let it boil gently, stirring constantly, till it becomes thick ; take it off the fire ; add the orange-flower water, or a few drops of almond-flavor, and serve in custard glasses.

NOTE.—Custards are both wholesome and nutritious, especially for delicate stomachs, and for those recovering from sickness, especially if used in moderation, they supply the waste of nerve-tissue better than meats or breads. The custard pie is made by baking the custard in an appropriate crust.

PUDDINGS.

RICE PUDDING.—One cup of fresh whole rice ; nine cupfuls of new milk, and one cup of sugar. Put into a stone or earthen pan, and bake in a moderate oven three hours. Stir it two or three times during the first hour ; do not increase the heat of the oven after the milk begins to simmer ; be careful not to scorch or blister ; a light cover toward the last will be better. Set to cool undisturbed. It is best eaten cold. Raisins may be added, if desired.

ANOTHER.—Five tea-cupfuls of rice picked and washed ; fifteen quarts of new milk ; one and a half pound of white sugar ; one pound of raisins. Bake three hours in a moderate oven ; stir it occasionally for two hours ; then leave it to brown over. This makes a delicious pudding, plain and simple.

BREAD PUDDING.—To one loaf of bread, well grated, pour two quarts of boiled milk or cream ; four eggs ; a quarter of a pound of white sugar ; flavor to the taste (mace is a very good flavor), and bake an hour. If the boiled milk is poured upon pieces of stale bread and left standing two hours, they can be mashed and freed from lumps with the hand before putting in the eggs. Dried currants, that have been well washed and swelled in lukewarm water, or raisins, will be a good addition to this pudding. If made with crackers it will be still more delicate. Cold sauce may be eaten with it or fruit sauce, if no fruit is put into the pudding.

APPLE AND TAPIOCA PUDDING.—Put a tea-cupful of tapioca into a quart of warm water before breakfast ; set it where it will keep warm for three hours ; stir it from the bottom once or twice and keep covered. Pare and cut in thin slices five or six nice tart apples, and lay them in the bottom of the pudding-dish ; add a heaped cupful of sugar, dissolved in hot water, to the tapioca ; stir well together, and pour over the apples ; bake slowly for two hours. To be eaten with whipped cream flavored with a little lemon or orange. Good either hot or cold.

GRAHAM GEM PUDDING.—Take six cold gems—yesterday's baking ; break them into small pieces, and pour over them one pint of cold water ; cover and let them soften for an hour ; then add a pint and a half of new milk ; a handful of seeded raisins or currants ; one beaten egg, and one tea-spoonful of cream-yeast. Mix half a cup of sugar and the cream-yeast thoroughly together, before putting them with the other ingredients. Stir together well and quickly ; butter the pudding-dish with cold, sweet butter, and bake in a quick oven three-fourths of an hour.

STEAMED GRAHAM PUDDING.—Sour milk or fresh buttermilk, five cupfuls ; brown sugar, two cups ; butter, half a cup ; two tea-spoonfuls of soda ; two eggs ; half a pound of seeded dates. Graham flour enough to make a thin batter. The dates should be chopped fine and rolled in flour before they are put into the batter. Steam for three hours. Make a sauce of milk and cornstarch, or eat with good cream.

APPLE AND BREAD PUDDING.—Break and rub bread fine ; peel and chop good, sweetish apples—sweet apples keep their place, and take a little longer to cook ; butter a pudding-dish, then put a layer of apples an inch deep, then a layer of bread-crumbs not quite so thick, then another layer of apples, alternating, till the dish is full ; bread being last. A little butter may be added to each layer of bread, or a table-spoonful of cream sprinkled over each. Bake an hour, or till the apples are thoroughly cooked. Serve with sweet sauce, or cream.

CHERRY PUDDING.—One quart of scalded milk ; one pint of corn meal ; half a pint of Graham flour, or a little less of fine flour ; four eggs well beaten ; a tea-spoonful of yeast-powder, and a pint of ripe cherries ; wash, and pick out the imperfect cherries ; leave the seeds in ; drain off all the water, and roll the cherries, while damp, in some of the flour. Stir all together ; put into a pudding-mould or bag, and boil two hours. To be eaten with sugar and cream. The late black cherries are the best for this pudding. They are not so juicy, retain their shape, and diffuse a rich purple tint around them, which makes the pudding handsome for the table.

POOR MAN'S PUDDING.—One cup of flour ; one cup of cornmeal ; one table-spoonful of cream-yeast powder mixed well with the meal and flour ; two cups of rich milk ; one cup of molasses ; one cup of currants washed and rolled in flour ; one table-spoonful of butter rubbed evenly and cold into the pudding-mould. Mix the ingredients well together ; put into the mould, and boil three hours. Be careful to keep the pudding-mould upright in the boiling kettle. Do not allow the water to stop boiling at any time, or to boil over the top of the

mould, as it is almost impossible to have the lid so close that water will not get in and quite spoil the pudding. When done turn the pudding out of the mould into a broad platter and serve hot with cream sauce.

NOTE.—The *poor* man's pudding may suggest the possibility of not having a *moula* to boil it in. A small, high tin pail with a lid which can be tied down tight will do quite as well, though it may have to boil an hour longer, to cook the center of the pudding. A pudding-bag dipped in cold water and floured inside is just as good. The pudding-mould is a great convenience, not an essential.

COTTAGE PUDDING.—One-half cup of sugar; one egg; one cupful of cream; one pint of flour; one heaping tea-spoonful of Taylor's cream-yeast. Bake in a cake-pan. To be eaten with a hot, sweet sauce, or with cold cream.

GRAHAM BIRDSNEST PUDDING—Is made by laying in a deep dish nice quartered apples, and pouring over them a thin batter made of flour; one tea-cup of sour milk, and about one-third of a tea-spoonful of soda. Bake in a moderate oven till the apples are thoroughly cooked.

TAPIOCA CUSTARD PUDDING.—Soak two table-spoons tapioca over night in cold water; when ready to make custard, boil one quart milk; while boiling add beaten yolks of three eggs, three-fourths cup sugar, and the tapioca; turn in the dish you wish to serve it in; have the beaten whites ready, sweetened a little and spread over top; put in oven and just brown a little. Eat cold.

DELMONICO PUDDING.—Three table-spoonfuls cornstarch; one quart boiling milk; three eggs, whites and yolks separated. Mix yolks with cornstarch and add milk gradually. Let it boil. Beat whites to stiff froth, sweeten. Put cornstarch in pudding-dish, cover with frosting and set in oven to brown. To be eaten cold.

NICE CHEAP PUDDING.—One quart of milk; four table-spoonfuls of flour; four eggs; six table-spoonfuls of sugar; nutmeg. Steam three-fourths of an hour.

SAGO PUDDING.—One dozen tart apples; one and a half cups of sago; soak the sago till soft; peel and core the apples, and place in a dish; fill the apples with sugar; pour the sago over, and bake till the apples are cooked.

SAGO BIRDSNEST PUDDING—Is made by laying quartered fresh apples, or stewed dried ones, in a pan about half full, and pouring over them the sago, prepared as for a thin mush; then bake in a moderate oven till the apples are cooked; say an hour or more, according to the size of the pudding.

INDIAN PUDDING.—*Extra good*.—Two tea-cups of cornmeal; half a cup of superfine flour; one cup of syrup; half a tea-spoonful of salt. Scald three quarts of milk, and stir into the above. Let it stand half an hour—stir it again. Bake quickly until it boils, then slowly about two hours.

A SIMPLE CORNMEAL PUDDING.—Stir into a quart of boiling milk the yolks of two eggs, three heaping spoonfuls of meal and a half a cup of sugar, well beaten together. Cook five minutes, stirring constantly; remove from the fire, and add the whites, beaten to a stiff froth. Pour into a pudding-dish, and bake one hour in a moderate oven. Serve with cream and sugar.

BATTER PUDDING.—Take a half pound of flour; one pint of milk; two eggs, and one tea-spoonful of baking powder. Rub the baking-powder quite smooth; mix it well with the flour, then stir in nearly half of the milk, and beat it perfectly smooth; add the remainder of the milk and the eggs, well beaten; boil the pudding one and a half hours, in a buttered basin, and serve with sweet sauce; or put it into a buttered dish, and bake it in a quick oven.

BAKED BATTER PUDDING WITH FRUIT.—Take a half-pound of flour; one pint of milk; the yolks of four, and whites of two eggs, and half a tea-spoonful of baking-powder. Rub the powder till smooth, mixing it well with the flour, and as much milk as will make it a stiff batter; beat it till quite smooth, then add the remainder of the milk, and the eggs, well beaten. Put some apples, cut as for a pie, into a buttered dish; pour the batter over, and bake in a moderately hot oven. Damsons, currants, gooseberries, or rhubarb, may be used in the same way.

CAKES.

Cake is good and wholesome when it is plain and simple. It is bad when it is too rich and compounded of too many ingredients. It may be eaten freely like bread in the former case. In the latter it had better not be eaten at all. Children are generally fond of cake. It ought always to be so made that they can eat of it without injuring the vigor of the stomach, which should always be preserved. We would always have the family cake made of the best of coarse flour. It is sweeter and more wholesome. Most of the following receipts are such as have been used in our Institution for years; a few are favorites at other institutions. All may be varied to suit individual wants, always keeping in mind the two words, simplicity and healthfulness.

COOKIES FOR FORTY OR FIFTY.—Four cups of sugar; one cup of butter; two cups of sour milk; two tea-spoonfuls of cream-yeast, brown or white; flour sufficient to roll them out. Work them but little; make them thin, and bake in a quick oven.

CUP CAKE FOR SEVENTY-FIVE OR EIGHTY.—Four cups sugar (white); one of butter; four eggs; rub these together; then add three tea-cups of sweet milk; ten tea-spoonfuls Taylor's cream-yeast, mixed with the flour of which you use a sufficient quantity to make the whole into a stiff batter.

GRAHAM CUP CAKE.—Unbolted wheat meal, two cupfuls; buttermilk, one cup; molasses, half-cup; butter, quarter of a cup; eggs, two; soda, half a tea-spoonful. Bake half an hour.

DROP CAKES.—Put six well-beaten eggs into a pint of thick cream add a little salt, and make it into a thick batter with flour. Bake it in rings or in small cups fifteen or twenty minutes. The same may be made with Graham flour.

DELICIOUS CORN GEM CAKE.—One quart of cornmeal; two quarts of sweet milk; two heaped teaspoonfuls of cream-yeast; two eggs. Bake in a quick oven.

STRAWBERRY SHORTCAKE.—To a quart of flour (enough for two cakes) put three heaping spoonfuls of baking-powder (Taylor's). Sift together *thoroughly* and rub in one ounce of butter. Wet with a pint of sweet milk, using a spoon. The mixture will be somewhat softer than common pie-crust. Do not try to mould or roll out the dough. Spread it on tin pie-plates by patting with the hand. It should be about an inch in thickness. Bake slowly at first till the cakes have had time to rise; then increase the heat, and expect them to be done within twenty-five minutes. Split the cakes hot from the oven; spread the halves with butter (liberally if good), and cover them with the fruit previously sweetened. Place one on the other (the upper half is reversed of course), or each on a plate by itself. It is a good rule to sugar your strawberries before you begin to make your cake, and if they are large, or not very ripe, it is best to cut them in two, or mash them a little. Don't calculate for these cakes standing on the stove hearth a minute. They should be served like griddle-cakes—no time lost between the oven and the table. Observe these rules and you will have a dish as dainty as Izaak Walton's Baked Fish, of which he said, "It is too good for any but very honest people." When strawberries are gone, red raspberries (Clark's or Philadelphia) are very nice in their place. White currants are also very much liked as a substitute, and peach shortcake is hardly surpassed by the strawberry itself, if the peaches are first-rate. All these fruits should be prepared by sweetening an hour or two before wanted.

SHAKESPEARE CAKE.—Six cups of flour; one of sugar; one of rich cream; eight eggs.

ORANGE CAKE.—Two cups of sugar; yolk of five eggs and white of four; half a cup of water; two cups of flour; one teaspoonful of baking-powder, juice and grated rind of one orange. Spread and bake on tin pie-plates. This quantity should cover six plates. Make a jelly by beating the white of one egg to a froth, and adding to it three quarters of a pound of powdered sugar, and the grated rind and juice of another orange. Spread the jelly on the cakes and lay one above another in three tiers.

SILVER CAKE.—Two and a half cups of flour; half a cup of butter; two cups of sugar; three-fourths of a cup of sweet milk; white of eight eggs; two teaspoonfuls of baking-powder.

GOLD CAKE.—Two cups of flour; three-fourths of a cup of butter; one cup of sugar; one egg, and the yolk of eight eggs; two spoonfuls of baking-powder.

ITALIAN CREAM.—One quart of cream reduced by one pint of milk, and set on ice to cool. Beat the cream and milk with a good egg-beater fifteen minutes thoroughly. Dissolve two ounces of gelatine in a gill of water, and strain it through a flannel bag into the cream. Add two cups of sugar and flavor, if desired, with lemon or vanilla. Stir briskly for three or four minutes; pour into serving-dishes and set on ice to cool.

COOKIES.—One cup of butter; two of sugar; half a cup of milk; four eggs; two teaspoonfuls of baking-powder; half a nutmeg. As little flour as possible, and roll out.

SPONGE CAKE.—Six eggs; the weight of six eggs in sugar, and the weight of four in flour, with lemon extract, or a little grated lemon-peel; a little salt, and a spoonful of baking-powder.

DELICATE CAKE.—When making cocoanut-custard use the whites of the eggs as follows: One cup of white sugar; five table-spoonfuls of butter; whites of six eggs; one teacup of sweet milk; three cups of prepared flour, or to the same quantity of common flour add one teaspoonful of soda, and two of cream-of-tartar sifted in the flour. Flavor with orange, lemon, or vanilla.

NOTE.—So says Mrs. Beecher: "We would substitute a teacupful of sweet, rich cream, instead of the milk and butter. Also, cream-yeast instead of prepared flour, or soda and cream-of-tartar." We give in this connection a recipe for cocoanut-custard, as the two can be more economically made at the same baking.

COCOANUT CUSTARD.—One pound of grated cocoanut; one pint of rich milk, and six ounces of sugar. Beat the yolks of six eggs and stir them into the milk with the nut and sugar. Put into a farina-kettle, or into a small pail which you can set into a kettle of boiling water. Stir all the time till very smooth and thick; as soon as it comes to a boil take off and pour into cups.

GROUND RICE CAKE.—Break five eggs into a stewpan, which place in another, containing hot water; whip the eggs for ten minutes till very light; then mix in by degrees half a pound of ground rice; six ounces of powdered sugar; beat it well; any flavor may be introduced; pour into a buttered pan and bake half an hour.

MOLDED FARINACEA.

ARROWROOT.—Take four ounces of arrowroot, one quart of new milk, and four ounces of white sugar. Set a pint and a half of milk on the fire, adding the sugar; when boiling, put in the arrowroot, previously mixed till perfectly smooth with half a pint of cold milk, and stir constantly till it has boiled three minutes; and pour it into a mold previously dipped in cold water.

BARLEY.—Six ounces of Scotch barley; three pints and a half of water, and six ounces of sugar. Steep the barley twelve hours; drain it, and pour the water, boiling, upon it; stew quickly in the oven in an earthenware jar, covered, till perfectly soft, and all the water is absorbed; when about half boiled enough, add the sugar, and

a few drops of pure lemon juice; pour it into a mold, and let it stand to set. When boiled quickly, the above quantity requires two hours and a half, and is a much better color than when it is longer in preparation.

MOLDED RICE.—Take eight ounces of rice and one and a half pints of milk. Wash, and swell the rice in the milk, till the whole of the milk is absorbed and the rice thoroughly softened; then pressing it into a mold or basin for half an hour, with a weight upon it, serve it, turned out, with preserved or stewed fruit.

MOLDED SAGO.—Take five tablespoonfuls of sago; one-fourth pound of sugar, and a little pure lemon juice. Steep the sago a quarter of an hour in half a pint of cold water. Pour on it one and a half pints of boiling water, and boil the whole in an earthen vessel in the oven about one hour, occasionally stirring it. Pour into molds or basins, and let it stand. When cold, turn it out, and serve with stewed fruit.

SAGO WITH FRUIT.—Take four ounces of sago; half a pint of raspberry and currant juice (strained), and six ounces of loaf sugar. Wash the sago and steep it one hour in cold water; strain off the water; add the juice and boil gently a short time, stirring it occasionally, and adding the sugar; when clear, pour it into a mold; let it stand twelve hours, and pour it on a flat dish.

TAPIOCA.—Take three ounces of tapioca, two ounces of ground rice, one pint and a half of milk, and eight drops of almond-flavor. Wash the tapioca in water two or three times; mix with the ground rice; add half a pint of cold milk, and let it remain thirty minutes; then add the remainder of the milk, and simmer it half an hour, stirring well the whole time; add the almond-flavor, and pour it into a mold previously dipped in cold water.

CRACKED WHEAT.—For a quart of the cracked grain have two quarts of water boiling in a smooth iron pot over a quick fire; stir in the wheat slowly; boil fast and stir constantly for the first half hour of cooking, or until it begins to thicken and “pop up;” then lift from the *quick* fire and place the pot where the wheat will cook slowly for an hour longer. Keep it covered closely, stir now and then, and be careful not to let it burn at the bottom.

Wheat cooked thus is much sweeter and richer than when left to soak and simmer for hours, as many think necessary. White wheat cooks the easiest. When ready to dish out, have your molds moistened with cold water, cover lightly, and set in a cool place. A handful of raisins added with the wheat is an addition. Eat warm or cold, with milk and sugar, or fruit.

MISCELLANEOUS DISHES.

A STORY is told of an old doctor who always emptied the odds and ends of every medicine he used into a large bottle, and when he had a patient that he was in doubt about as to what medicine he needed, he always gave him a dose from this bottle. “Some one of the many

drugs will meet the case," said he : so in this list of miscellaneous dishes, which were not properly classified, or were received after the foregoing portion of this work was in type, something will be found to meet the wants of the table when the good house-wife don't know what else to get. We shall commence the list with a recipe for making Dr. Heald's favorite bread. It was, so far as we know, invented by the Doctor and his good wife, and is much used in his Institution. We also add a few other bread recipes recently sent in by our correspondents :—

DR. HEALD'S FAVORITE BREAD.—Stir the best white wheat meal into cold water, until the batter so formed can no longer be worked with the spoon. Then sprinkle meal upon your bread-board, and knead the dough *thoroughly* for ten, fifteen, or twenty minutes, as you have time, and desire the bread softer or harder. Work in all the meal you can while kneading. The more you knead it and incorporate air with it the lighter and better it will be. When sufficiently kneaded, roll out with the hands on the board into a cylindrical form two inches in diameter ; cut into pieces three inches long, and roll these into rolls a little shorter than your oven grate, and one inch in diameter ; place them on the *hot* grate, just from the range or stove, and bake in an oven, not quite so hot as for "Gems," twelve to twenty minutes. *Break* into pieces three inches long for table. We think this the best and sweetest bread that can be made.

COARSE OR GRAHAM BREAD.—No. 1, or fine Graham flour, makes the best bread. The sponge is made at the same time, and in like manner to wheat bread, except the water used, which is ten degrees colder, as coarse flour rises quicker than fine. The same proportions of milk and water used. It is generally sweetened a little with sugar. When the sponge is added, make as stiff a batter as can be stirred conveniently. When light, mold into soft loaves. For this reason, it wants the hottest place in the oven.

RYE BREAD is made like wheat, with one exception—the loaves are made quite soft. As little flour as possible is used in molding.

CORN OR BROWN BREAD.—The sponge is made of unbolted rye or wheat. In the morning take four quarts of Indian meal, make a thin batter, using hot water. Let it stand half an hour to swell ; then pour in the sponge and one quart of molasses, three quarts of rye meal, or enough to make a stiff batter ; then put into covered dishes to rise. Bake three hours.

BOILED WHEAT.—Take good plump wheat ; pick it carefully, and wash clean ; soak over night in soft water, and boil in same water till softened through, which will require several hours. Rye or barley may be cooked in the same way. Serve with cream, sugar, and ripe fruit.

BROWN BREAD.—Mrs. Susan Everett, M. D., sends the following from a lady who attended one of her courses of lectures. The author states that twenty-five years ago she attended a course of lectures on hygiene and the lessons she then learned have enabled her to keep in

good health ever since. She sent this recipe with a loaf of delicious brown bread to Mrs. Everett during her course of lectures at Perth Amboy, N. J. We regret that we are not permitted to give the lady's name :—“ We make our own yeast from hops of our own raising. The vine makes a delightful shade for the south end of our back porch, and from that vine we gather, the last of August, hops enough for our own use during the year, and also for some of our friends. To three pints of water put a handful of hops, and boil them half an hour; put into your yeast pot or jar six tablespoonfuls of flour and one teaspoonful of salt; set your jar near the kettle, and dip the hop tea into the jar through a sieve or colander. When you have strained enough to wet all the flour, stir it well, and then strain upon it the rest of the hop water. The mixture should be about the consistency of batter for griddle cakes. When it is *cool*, not *cold*, stir in a gill of good yeast; set it in a warm place; do not cover it close. When fermented, put it in a cool place, and cover close. This is the yeast from which we set our white bread at evening. The next morning we take a good handful of the dough; put it in a large yellow bowl, and add a teaspoonful of salt, a half cup of molasses, a pint of lukewarm water, and enough Graham flour, making a dough softer than for white bread; set it to rise and bake. We do not *knead* this bread. This makes two loaves. Brown bread is not improved by sugar.”

ANGER'S METHOD OF MAKING GEMS.—“ *To the Editor.*—By your special request I will here state my experience in regard to the method of making the Graham gems. The flour is the principal ingredient, and on it depends chiefly the success of the baker; it must necessarily be of the very best kind, made of the best winter wheat, and be possessed of the qualities commonly known as “dry and strong.” The treatment varies according to the qualities of the flour. If the flour is of the kind -described above, the dough can be baked immediately; but if the flour be moist the dough must be allowed to stand in a warm place for at least four hours, in order to obtain a palatable article. The German hygienists allow the dough for their unleavened bread to stand six hours, in every case; this is, however, unnecessary, provided the flour is of good quality. The next in order is a good baking oven, one that is capable of baking equally as well from the top as from the bottom; it is difficult to state the exact amount of heating required, as some ovens are more easily heated than others; suffice it to say that a quick oven is necessary, and that the glaring heat, which always accompanies a freshly-heated oven, be allowed to pass away before baking the gems, as they are very apt to blister on the top, especially the water gems. In mixing the dough take blood-warm milk or water, adding the flour and beating thoroughly for at least five minutes. It is better to retain some of the milk or water one intends to use, making the dough slightly thicker, beat it well, and then add the remaining milk. By this method the dough becomes more thoroughly mixed, and is entirely freed of the small lumps that are so difficult to get rid of. If milk is used, make the dough thick enough, so that it can be spooned out comfortably; but for water gems it must be made somewhat thicker.

“ The pans used in baking the gems are of oval shape, measuring two

and a half by one and a half inches ; eight of these unite in making one pan ; there are also some pans made of tin, but as the cast iron pan retains the heat longer it is the best.

“ If the dough is ready and the oven heated, then put some of the pans in the oven and allow them to become quite hot ; take one out, grease it with a clean rag dipped in butter, and drop the dough in the pan with a large spoon ; return the pan quickly to the oven. If the pan is too hot, so that when greased the butter is burned, allow it to cool before using it, as the gems will be apt to stick to the pan and be burned. After eight or ten minutes they must be looked after, and if they are getting too brown must be put in a cooler place and allowed to bake for another ten or fifteen minutes more. They ought not to be taken out before they are thoroughly baked, as they will become wet and doughy if taken out too soon, and no amount of after baking can undo this. They may be eaten hot with impunity, a quality not possessed by any other form of bread.

“ L. F. J. ANGER.”

[We can testify from personal knowledge that Mr. Anger's gems are unsurpassed in delicacy and perfection by any we have ever tasted.—ED.]

RUSK.—Beat three eggs thoroughly, then beat in a cupful of sugar, and a little flavoring to the taste of lemon or nutmeg. Add a tumbler and a-half of rich cream which has first been mixed with a little flour ; use no more flour than will give it consistency enough to be molded. Let it rise all night or all day, and when very light put it upon tins to rise again before baking. Bake in a quick oven fifteen or twenty minutes.

TOMATO CUSTARD.—This is said to be a beneficial diet for consumptives. It is made by straining finely stewed tomatoes through a coarse sieve, and adding two pints of milk which has been scalded and cooled, and one pint of tomatoes, for four eggs, and one teaspoonful of sugar. Bake in small cups quickly.

COOKING RAISINS.—It is well to cook before putting them into pies, cakes, or puddings. Soaking is not sufficient. Steaming them by pouring a small quantity of boiling water among them in a tightly closing dish, and allowing them plenty of time to cook before opening, is a good plan. When raisins are rightly cooked before using, they are plumper and more palatable, and can be eaten without injury by most dyspeptics.

TOMATO PIE.—Peel and slice ripe tomatoes and lay them on dishes as for apple pie. Sprinkle on a little flour ; and sugar to suit the taste. Bake with two crusts, in a moderate oven. This as well as green apple pie can be made with one crust only, by stewing the tomatoes or apples before putting into pies.

BARLEY PUDDING.—Prepare a half pound of pearl barley, one quart of new milk, and six ounces of sugar. Put the barley in fresh water, and let it steep twelve hours ; pour the water from it, add the milk, sugar, and a small salt-spoonful of salt, and bake it in a slow oven. If a richer pudding be required, take it out of the oven when

nearly done, stir in two ounces of butter, four well beaten eggs, a little flavoring, or any suitable seasoning; return it to the oven in a buttered dish, and bake it one hour.

ASPARAGUS AND TOAST.—Asparagus, the best of the greens. Wash, pin up in a cloth, and boil gently in a little pure water about twenty minutes. It goes well with samp and potatoes, without condiments, but some people will not be content without dressing. The least objectionable dressing is the white sauce—milk thickened with wheat-meal and slightly salted. “Asparagus toast” is made by cutting wheat-meal biscuit into thin slices, dipping in hot milk, spreading on a platter, laying the boiled asparagus on it, and pouring over it the white sauce. “Asparagus peas” are prepared by just cutting into bits the tender part of the raw asparagus, boiling in just water enough to cover it until done, skimming out, dishing, and pouring over it the white sauce.

GRAVY FOR CHILDREN.—For a pint of gravy you want a large spoonful of flour, stirred smoothly into half a teacup of the cold milk. Let the milk be boiling when this is added, and kept constantly stirring, or the gravy will be lumpy. If cream is used instead of milk no butter is necessary. The milk should be stirred while coming to the boil to keep it from burning. It is less likely to burn if a little butter is melted in the spider before pouring in the milk. Add a little salt. For bread and potatoes it is better by far than meat gravy, and not only palatable and wholesome, but nutritious.

OATMEAL JELLY.—A very delicate breakfast-dish can be made of “oatmeal jelly.” Soak half a pint of good oatmeal over night in one and a half pints of water. In the morning drain off the water through a sieve, adding to it one and a half pints hot water, and put it to boil over a quick fire. Stir till it boils, then set it back and let it simmer ten minutes. Turn it into molds, and in fifteen minutes it will be set sufficiently to turn out into saucers, and will be warm enough to eat. Serve at once, without trimming, or with a little milk or sweetened fruit-juice. The soaked meal that is left can be utilized in batter-biscuit, or corn-meal mush, or made into a porridge by itself. In the latter shape it is bland, and peculiarly suitable for invalids who have not yet learned to like oatmeal. These preparations are in no way better than the whole oatmeal, excepting for variety.

TOMATO SOUP.—To make one gallon, take three quarts of good beef stock; one medium-sized carrot; one medium-sized turnip; one beet; one small onion. Peel and cut these up in small pieces; then add three quarts of best fresh tomatoes, and boil for an hour. Strain through a sieve; then put five ounces of butter in a saucer; heat it to a light brown; now, take it off the fire, and add, while hot, three table-spoonfuls of flour. Put in the boiled tomatoes, and season to your taste. Add one dessert-spoonful of sugar. Put it on the fire and stir it till it boils. Let it boil for five minutes, skimming it the while. It is now ready for the table. More sugar and flour can be added, if necessary.

USE FOR COLD MUSH.—A good way to use cold mush of any kind, either oatmeal, Graham, or Indian. After taking off the skin which

forms, or any part which may be dry, mix a little milk with the mush to soften it ; then work in Graham or middlings till you can make the dough up into balls as large as a black walnut, and bake on the grate in a moderately quick oven.

BOILED RICE.—Wash and drain off one pint of good new rice ; put into a covered saucepan with one quart of boiling water. Boil briskly for five or ten minutes, or until the water is mostly absorbed ; then set on one side of the stove, and let it steam steadily fifteen or twenty minutes. Keep closely covered all the time, and do not stir it at all after it begins to boil. The Southern people, who know both how to cook and to eat rice, never allow the lid to be removed while the steaming is going on ; perhaps just lifting one side of the cover to peep in, and see that it does not burn. When done just right, every grain will be swelled to its utmost, and bursted open. To be eaten as a vegetable, or with cream or maple syrup.

OATMEAL MUSH.—Julia Colman, who has charge of the cooking of the Hygienic Hotel, No. 13 & 15 Laight Street, New York, hands us the following method :

“ To three quarts of boiling water add one level teaspoonful of salt and one quart of *good* oatmeal, stirring while the latter is poured in slowly. Let it stand where it will boil gently, and stir it occasionally for ten minutes, or until the meal is evenly diffused through the water. Then cover close, and place where it will barely simmer for one hour. Do not stir it during that time. Serve warm, messing it as little as possible.

HYGIENIC PLUM PUDDING.—This is from the *Dietetic Reformer* : “ Put together in a basin some currants and sultana raisins that have been well washed and dried ; add wheat-meal flour in proportions preferred, whether for a *plain* pudding or more fruit ; stir in gradually cold filtered rain-water, beating the mixture well ; make it the usual consistency of plum-pudding ; bake in a well-buttered dish, or boil several hours in a cloth. To suit some tastes, add a little sugar, candied peel, and grated lemon peel.”

A DELICIOUS CRACKER.—A delicious and wholesome cracker.—Take equal parts “ middlings ” and Graham flour. Wet with new or sweet milk, and knead rather stiff. Work it a good deal on the board ; then roll out to one quarter of an inch in thickness, and cut out in diamonds or squares ; prick them, and bake in a quick oven. Bake best right on the grates.

MIXED GEMS.—Take a half-pint of corn-meal, pour boiling water upon it, enough to wet it ; then cool with skim-milk to the consistency of pancake batter ; and thicken with equal parts of “ middlings ” and Graham flour ; to be baked the same as gems, only not so quickly.

QUAKER MINCE PIES.—Chop fine a half-dozen of large bell-flowers or greenings ; add one cup of raisins, well cooked ; one cup of canned cherries, whortle-berries, or other fruit to suit the taste ; then a pinch of salt, and sugar or syrup enough to sweeten to the taste ; lastly, add a cup of sweet cream when ready to use. Bake with cream crust.

BAKED OR STEAMED INDIAN PUDDING.—For one quart of sweet milk take a half-dozen large spoonfuls of best corn-meal ; wet it with syrup, and pour the milk over boiling hot—stirring it meanwhile. Chop fine three or four large sub-acid apples, and stir in ; steam or bake three-quarters of an hour ; then beat an egg with a spoonful of sugar, and add a little milk, and stir in.

NEW WAY TO SERVE EGG PLANT.—The vegetable egg we think has been undervalued, more on account of its improper preparation than for its demerit—the saturating it in butter and lard being the greatest objection.

Wife has this season prepared as follows : Peel and then cut egg in slices or pieces ; add water enough to boil soft, and salt to suit taste. When soft pour off water and mash it ; make a batter of flour and eggs (chicken) ; mix the whole together, and bake like griddle-cake. When the proper quantities are mixed it will make a nice brown cake, with no grease (except to keep free from pan), and free from the strong wild taste which is generally disliked. We think the egg is destined to become a more general article of food, especially among hygienists. So says H. M. ENGLE.

MAPLE SYRUP.—This is the most delicious of the sweets. Every family should have some. If given to children on oatmeal or cracked wheat for breakfast every morning they would thrive like calves well fed with milk. To make a good maple syrup, melt with one pound of maple sugar two pounds of best white sugar. It will not do to use the brown, as this is not clean enough.

TOMATO GRAVY.—Scald, peel, and cut very fine, a pint of good, ripe tomatoes ; put into a stewpan, with a pint of boiling water, and stew them one hour ; stir frequently to keep them free from the bottom, and to make them very smooth and fine. When they are stewed down to a pint, rub a large spoonful of flour with a lump of butter the size of a walnut, and stir into the tomatoes ; stir thoroughly till they are cooked, then pour a pint of rich, sweet cream into the middle of the thickened tomatoes, and let them become boiling hot before you stir them ; then stir well together, and boil five minutes. Salt to taste. Cut a slice of brown bread, or split gems into four pieces, lay into a vegetable dish, and pour the tomatoes over them. This is very nice when, well cooked, and all the ingredients are sweet and fresh. Children who are fond of tomatoes like this modification of cream and gravy.

APPLE PAN DOODY.—For a family of six persons use a two-quart tin or earthen pan. Use the best pie apples. Pare and slice the apples nicely. 1st. Place a layer of apples about an inch thick, season with a speck of salt and sugar. 2d. Put a layer of cracker crumbs half inch thick. Alternate a layer of apples and cracker crumbs until the pan is full. Bake one hour, and serve with cream or rich milk.—R. I. Greenings are the apples for pies and puddings.

BAKED APPLES.—Select sound apples of one size—pippins or some other well-flavored apple—peel and core ; use a small knife with a narrow blade, and take out the core of the apple from the blossom

end—the core lies nearest to that part—do not go through, but make a cup, into which put a teaspoonful of sugar ; set the apples close together in a deep dish, add a teacupful of water, put into the oven and bake. Sweet apples prepared in the same manner are very nice. A lemon cut in very thin slices, and a slice laid on each apple may be a desirable flavoring.

BOILED PEARS.—Take hard pears, wash, and remove specks ; be sure that they are sound at the core ; put them into a fruit-kettle, cover them with water—at least a quart—and boil them slowly an hour ; then add a sufficient quantity of sugar to make a lively syrup ; boil half or three-quarters of an hour, and serve cold.

CRUSHED WHEAT.—This preparation of wheat is not yet generally in use by those who are in favor of farinaceous food. The whole grain is “crushed” in such a manner as to retain all its particles quite together. Nothing is lost or sifted out. It is made from good white wheat, and is very clean, and well put up in packages. It cooks more readily than the cracked grain, has more gluten, and has all the sweetness and flavor of the wheat. I cook it just as I do oatmeal ; having a quart or two of boiling water on the fire, stir in two handfuls of the grain—all I can grasp—for each quart of water ; boil rapidly for twenty minutes, stirring frequently to prevent its adhering to the bottom of the kettle ; then let it simmer over a slow fire for ten minutes, covered tightly. I like it better when cool ; the gluten forms a jelly, and when molded makes a handsome dish for the table. To be eaten warm a little more grain must be added when you make it. It is delicious and wholesome with cream, light fruits, and sugar.

FRENCH HONEY.—Break one pound of lump sugar into pieces, put it into a pan, and add the yolks of six eggs, and the whites of four, the juice of four lemons, and the grated rind of two, and three ounces of butter. Stir this mixture over a slow fire, until it becomes thick like honey. It will keep a year, put into a dry, cool place. This is nice for a variety of tarts or shells.

JELLIES.—Currants and grapes make the best and cheapest jelly for home use. Select large, ripe currants, fresh from the bushes as possible, pick out all the leaves or old currants, let the clusters remain on the stems ; weigh six pounds of the fruit thus cleaned, put into a stone or earthen vessel, add a pint of fresh water, then take a wooden masher and crush the berries thoroughly. I have a strong, thin linen towel sewed firmly into a poke, into which I put a pint or so of the crushed berries, wring and squeeze them completely ; emptying and filling until all the juice is secured, of which there will be about five pints. To this juice add five pounds of best brown sugar, putting the whole into a porcelain kettle over a good fire, stir slowly with a silver or wooden spoon, and let it boil fifteen or twenty minutes. By this time, if the fruit is fresh, there is no failure of the jelly. Then I put it up in pint size, self-sealing glass jars for common use. It is, I really think, as cheap, and far more delicious for meats than cranberries, and as a relish of fruit. It costs about twenty-five cents a pint, or pound. The best brown sugar makes the richest jelly, and with more uniform success. If you want a delicate color, and more acid jelly, use white

sugar. Black currant jelly is considered very beneficial in diarrhœa, and other diseases of like nature.

GRAPE JAM.—Slip the skins off from the pulps and put them into an earthen dish ; put the pulps into a porcelain kettle over the fire, cover them, and bring them to a boil, being careful not to burn them ; boil and stir them till the pulps are broken and the seeds are separated ; remove from the fire, and let the seeds settle to the bottom of the kettle ; then pour off the juice or strain it through a colander, and put back into the kettle ; add the pulps and their weight in best brown sugar ; simmer slowly, stirring frequently for an hour ; put up as you would fruit in glass cans. If you cook it long enough to keep without being air-tight, the flavor of the grape will be spoiled.

Plums and late *Cherries* are excellent fruits for jams, light preserving, and canning. Both of these fruits retain their own delicious flavor better if the seeds are left in. They are particularly relishable with farinaceous food.

JAM AND JELLY.—The fruit that comes from the vines or canes latest in the season makes the poorest jelly. If currants hang long upon the bushes, they lose most of their jelly-making property. They need to be used as soon as possible after gathering. One who desires clear, fine-flavored jelly will not squeeze the jelly-bag if it be of loose material. Fine flannel is best for this purpose, and when this is used some pressure is allowable ; but we wish to strain the juice not only free from stems, skins, and seeds, but free from all fine particles.

RASPBERRY JAM.—One pound of sugar to each pound of berries, and nearly a pint of currant juice. Put the sugar and berries together in a pan over the fire, and with potato-masher, or wooden spoon, keep mashing and stirring them constantly to prevent burning. When they are well mashed, add the currant-juice, and boil briskly, still stirring it carefully. Just before it actually boils skim it well. Let it boil about three-quarters of an hour to bring it to the right consistency. It is best to put it up in cups, bowls, or fruit-jars, as it does not keep so well after being disturbed. Cover the cups with firm paper varnished with white of egg, and pressed closely around over the edges of the cups. Jam should be kept in a cool, dry place.

GRAPE JELLY.—Put the grapes in a jelly-pan with a very little water ; simmer on the fire till quite soft ; then strain through a colander or flannel bag ; when the juice is all run out, measure, and allow fully one pound of loaf sugar to every pint of juice : boil till it jellies ; when it has boiled twenty minutes, try a little in a saucer. It should be watched for fear of boiling over. Common sugar may be used, but the jelly will not keep so long.

BARBERRY JELLY.—Scald the berries on the stems, and squeeze them through a thin cloth or flannel. Take one pound of sugar to one pound of juice. Boil together half an hour. Try a spoonful of the juice in a teacup of ice-water ; if it sinks to the bottom in a solid form, the jelly has come—if not, boil a while longer.

Barberry Jam is excellent if made by cooking and stirring with the berries a quantity of good sweet apples. Boil till the apples are thoroughly cooked and mixed, then can in glass cans.

BAKED IRISH POTATOES.—Boil soft eight good-sized Irish potatoes, mash them, add two tablespoonfuls of butter and a pint of milk : salt to taste. Put into a dish and bake half an hour.

TO DRESS SWEET POTATOES.—Put two or three platefuls in the oven, bake till quite soft ; peel and put them on a tin sheet, and bake again for half an hour.

ANOTHER WAY.—Another mode of dressing sweet potatoes. Boil the potatoes until quite soft ; peel and rub smooth with a spoonful of butter and salt. Bake in a pan, and turn into a vegetable dish.

RICE CAKES.—One pint of soft-boiled rice, a teaspoonful of butter, an egg, half a pint of milk, and half a pint of rice flour : salt to the taste. Beat all well together, and bake in patties.

CORN MUFFINS.—To three pints of corn meal add a pint of tepid water, a teacupful of bakers' yeast, a tablespoonful of sugar, and a teaspoonful of salt ; mix all well together and bake in rings. To be mixed at night, for use the next morning, etc.

CORN DODGERS.—One quart of corn meal, a little salt, and water enough to make the batter just stiff enough to make into cakes with the hands. Bake in a Dutch oven, on tin sheets.

NORTH CAROLINA DABS.—One pint milk, two eggs, a tablespoonful of butter, wine glass of milk : scald the meal, and while hot rub in the butter ; beat the eggs very light, and add to the meal, stir in the milk and a little salt. Drop the mixture from a spoon upon a tin sheet, and bake in a moderate oven.

MUFFINS.—One pint of milk, one dessert spoonful of butter, two eggs, half gill of yeast, a little salt, and as much flour as will make it thick enough for a spoon to stand. To be baked in rings.

GRAHAM MUFFINS.—One pint of Graham flour, a pint of milk, one egg, a little salt.

LOAF RICE BREAD.—One pint of rice flour, three eggs, a spoonful butter, saltspoonful of salt ; beat the eggs quite light ; stir in butter, flour, and salt. Dissolve a yeast powder in a little warm water ; mix well with the other ingredients ; pour into the pan and place it immediately in the oven. Bake nearly an hour in a moderate oven.

PAN JOURNEY CAKE.—Half pint rice, dessert spoonful of butter, two tablespoonfuls of milk, two tablespoonfuls of fine rice flour ; boil the rice quite soft, and stir the butter in while hot. If the bread is wanted for breakfast, the rice must be boiled the night before ; and if wanted for tea it must be prepared in time for it to become cold before the other ingredients are mixed in. When ready to bake, stir in the milk and rice flour ; spread the mixture about half an inch thick, in a shallow pan well greased. Bake half an hour in a moderate oven.

OKRA SOUP.—Cut up in fine slices two soup plates of okra, and put into a digester with five quarts of water and a little salt—at nine o'clock. At ten o'clock, add your meat ; at eleven, peel a soup plate and

a half of tomatoes, and after straining add to the soup, through the colander ; then season with pepper and salt ; allow all the ingredients to boil until two o'clock, when it is fit to be served up.

" EVERY-DAY " PUDDING.—Half a loaf of stale brown home-made bread soaked in a quart of milk ; four eggs, four tablespoonfuls of flour ; a little fruit, dried or fresh, is a great addition. Steam or boil three-fourths of an hour. Serve with the following sauce :

Butter, sugar, and water, thickened with a little cornstarch and flavored with lemon juice and rind.

FANCY DISH.—Take half a dozen eggs. make a hole at one end and empty the shells ; fill them with blanc mange ; when stiff and cold take off the shells ; pare lemon rind very thin, boil in water till tender, then cut in thin strips to resemble straw, and preserve in sugar ; fill a deep dish half full of jelly or nice cold custard, put the eggs in and lay the straws, nest-like, around them.

A NICE STRAWBERRY DESSERT.—A nice dessert is made by filling coffee-cups loosely with strawberries, and pouring over them Graham-flour mush ; or instead, thicken sweet boiling milk to a consistency which is thin enough to fill the interstices between the berries, and yet thick enough to be firm when cool. Turn out and serve up with cream and sugar.

EGGS WITHOUT BOILING.—Drop eggs into a sauce-pan of boiling water, which remove immediately from the fire. Let them remain in the hot water five minutes.

BEANS WITHOUT PORK.—Some families seem not to know that baked beans are delicious without pork, if properly cooked and seasoned. Boil a pot of beans until they are cooked thoroughly soft, take half for one day's bean-soup, and use the other half a few days later for baked beans. If the beans are old drop in a small lump or half-teaspoonful of soda. When this water boils, turn it off, and supply its place with clean boiling water. After the beans have boiled in this an hour, we change the water again—sometimes three times, but never after the beans have begun to come to pieces. Set them where they will not boil too hard, and cook them four or five hours, when they are well softened and separated. Then we stir into this soup salt, and a cup of cream if we have it ; if not, a tablespoonful or two of good butter. We take out half of the beans (if we have cooked enough for two meals) before seasoning the day's portion, and sometimes thin what is left for soup with hot water, and then put in the cream and salt, and boil and stir it all together. When we bake the reserved portion, we pour it into a large baking-dish or dripping-pan, stir in a spoonful of salt and a cup of cream, or creamy milk, and bit of butter, and bake an hour. I cannot believe that any one who tries it would prefer "pork and beans" to this. The most common mistake in cooking beans is to cook them too little. This is the cause of their flatulent tendency, and such result may be prevented by thorough cooking. The frequent changing of the water takes away the strong flavor which is disagreeable to many.

SPINACH WITH EGGS.—Wash the spinach leaves in several waters, and keep in cold water until time to cook it. Then put in boiling water enough to cover it, and add a little salt. Cover the pan, and boil the spinach briskly until the leaves are tender; they will sink when done. Then press the water out, cut the spinach fine, put it in the pan, season with butter, and serve hot. Have the eggs ready poached, lay them on the spinach, and mix well with it. This is a delicious dish, and seasonable in the spring of the year.

GEM AND CHEESE SANDWICHES.—Toast good cheese lightly; split wheatmeal gems in halves, and spread between two halves, so as to come to the edges all round, a slice of the toasted cheese. It makes a wholesome and palatable lunch; children are fond of it. Some object to toasted cheese. The principal objection to it is that it is generally toasted too much. If toasted dry, it is as hard to digest as a very hard-boiled egg. Another objection is, that it is too often eaten as a dessert with rich pie and cake, instead of with the principal part of the meal.

SIMPLE BEVERAGES FROM FRUITS.

THE juices of various fruits may be used with water and sugar for making most delicious and wholesome beverages.

Put a gallon of water on to boil, cut up one pound of tart apples, each one into quarters, put them in the water, and boil them until they can be pulped; pass the liquor through a cullender, boil it up again with half a pound of sugar, scum, and bottle for use, taking care not to cork the bottle, and keep it in a cool place: the apples may be eaten with sugar as a sauce.

ANOTHER WAY.—Bake the apples first, then put them in a gallon pan, add the sugar, and pour boiling water over, let it get cold, pass the liquor as above, and bottle.

APPLE TOAST AND WATER.—A piece of bread, slowly toasted till it gets quite black, and added to the above, makes a very nice and refreshing drink for invalids.

APPLE BARLEY WATER.—A quarter of a pound of pearl barley instead of toast added to the above, and boil for one hour, is also a very nice drink.

APPLE RICE WATER.—Half a pound of rice, boiled in the above until in pulp, passed through a cullender, and drunk when cold.

All kinds of fruits may be done the same way.

Figs and French plums are excellent; also raisins.

A little ginger, where desired, may be used.

FOR SPRING DRINK.—Rhubarb, in the same quantities, and done in the same way as apples, adding more sugar, is very cooling.

LEMONADES.

LEMONADE FROM PRESERVED LEMON JUICE.—Preserve your juice when lemons are plenty and cheap, by adding one pound of refined sugar to each pint of juice, stirring the mixture till dissolved, when it should be bottled. Put a teaspoonful of salad-oil on the top to keep out the air, then cork closely. When wanted for use, apply a bit of cotton to the oil to absorb it. To a goblet of water add sufficient of this juice to suit the taste. Every family should preserve lemon juice in this way for times of need. If hot lemonade is desired, use hot instead of cold water.

TEA LEMONADE.—To a cup of very weak cold tea add the juice of half a lemon. It makes a pleasant beverage for old people who use tea. It is not desirable for the young.

PINEAPPLE LEMONADE.—Peel twelve fresh lemons very thinly, squeeze the juice from them; strain out the seeds; pour on the peel a little hot water; let it stand a little while to infuse, covering closely. When cool, strain this water into the lemon-juice, adding a pound of loaf sugar. Put the whole into a decanter to be kept cool for present use. Use two tablespoonfuls for a glass of lemonade. To add to the delicacy of the beverage, add a slice of pineapple to each glass. To add to the appearance, add a thin slice of lemon. Cool, delicious, wholesome.

ORANGE AND LEMONADE.—Peel one large fresh lemon and six fresh oranges. Cover the peel with boiling water, and let it infuse in a closely-covered dish. Boil one pound of sugar in a pint of water, till a syrup is formed, skimming off any impurities, strain the peel-water, add it to the syrup when cold, and add the juice strained, stir well, and add cold water till it makes a pleasant drink. These methods of making drinks are more troublesome than the common way, but the result in the end is more satisfactory.

COMMON LEMONADE.—Cut three large fresh lemons in very fine slices, taking out the pips. Add half a pound of white sugar and about two quarts of water. Bruise well together and stir, and it is ready for use.

HOT LEMONADE.—Hot lemonade is often desirable in winter, when the body has been exposed to cold and is chilly. It is made the same as cold lemonade, except by using hot instead of cold water.

ENGLISH LEMONADE.—Pare a number of lemons, according to the quantity of drink you wish to make. Pour boiling water on one quarter of the peel, and let it infuse. Boil your sugar to the consistency of a rich syrup, adding the white of an egg whipt in. When it boils pour in a little cold water to stop it, then let it boil again, when the pan should be taken off to cool and settle, skimming off any scum that comes to the top. When settled, pour off the syrup into the peel water, now add the juice and as much water as is necessary to make a rich drink. Strain through a fine jelly bag.

LEMON WHEY.—Boil as much milk as you require, squeeze a lemon, and add as much of the juice to the milk as will make it clear. Mix with hot water, and sweeten to taste.

LEMON WATER.—Cut a fresh lemon into very thin slices, put them in a pitcher, and pour on one pint of boiling water. Let it stand till cold, sweeten to taste, and use.

MILK LEMONADE TO KEEP A DAY OR TWO.—Pare twenty-four large fresh lemons as thin as possible; put eight of the rinds into three quarts of hot but not boiling water, and let it stand three hours. Rub fine sugar on the rind of the others, to absorb the essence. Put it in a china bowl, and squeeze the juice from the lemons over it, after which add a pound and a half of fine sugar. Now put the water to the above, and add three quarts of boiling milk. Mix and pour through a jelly bag. Use the day after made.

SIMPLE DRINKS FROM VARIOUS SUBSTANCES.

AMERICAN TEMPERANCE BEVERAGE.—Twelve lemons, one quart of ripe raspberries, one ripe pineapple, two pounds best refined sugar, three quarts of pure soft cold, but not iced, water. Peel the lemons very thin, squeeze the juice of all over the peel, let it stand a few hours, add the two pounds of refined sugar, mash the raspberries with half a pound of same sugar, cut the pineapple, after paring it, in very thin slices, and cover them with sugar. Strain the lemon-juice, crush the raspberries, press the pineapple, put the lemon-juice in a bowl, add the three quarts of water, add the crushed berries and pineapple, stir all together till the sugar is dissolved and it is ready to serve. This makes a delicious beverage.

CRANBERRY DRINK.—Mash a tea-cupful of clean fresh cranberries in a cup of cold water. Boil a large spoonful of oatmeal and a slice of a lemon in two quarts of water; add the cranberries and as much sugar as will sweeten to the taste. Boil for half an hour and strain.

EGG TEA.—It is a common but injurious practice for women to take a cup of hot tea on an empty stomach when tired and exhausted. An egg broken into a weak cup of tea, well beaten and mixed with a glass of cold sweet milk, is much less injurious, and really nourishing.

TAMARIND WATER.—Boil an ounce of tamarinds, three ounces of currants, and two ounces of stoned raisins in three quarts of water, until nearly a third has evaporated.

Pure tamarind water is much used in fevers, and is considered a cool and refreshing beverage. It is made by dissolving the pulp in boiling water, straining and cooling, or it may be prepared with barley water and treated in the same way.

STRAWBERRY DRINK.—Boil a pound of sugar in a pint of water till it makes a syrup. Add a pint of strawberry juice, and boil gently for an hour. Cool, and bottle in well corked bottles for use. Add water to taste. It is a delicious spring drink.

A very delicious drink may be made from canned strawberries, water, and sugar, for early spring use. This fruit is rarely canned, but is the most wholesome of any for early spring use before other new fruit can be had. The acid acts favorably in clearing out the system, acting on liver and bowels.

BLACKBERRY DRINK.—A delicious drink is made by stewing a pound of ripe blackberries in a quart of water, adding sufficient sugar to make the drink palatable, and pouring off the fluid. The berries may be eaten separately. An equally pleasant drink may be made by stewing dried blackberries, adding sugar to make it sufficiently sweet. The amount of water and sugar may be decided by the taste.

RASPBERRY DRINK.—Take fine red, ripe raspberries, crush them in a sieve, and press out the juice, to each pint of which add a pint of syrup made by boiling a pound of sugar in a pint of water, the scum being removed. When the syrup and juice are mixed, boil slowly for an hour, cool, bottle, cork, and seal. When wanted, dilute with water to the right consistency. A delicious drink is quickly and cheaply made by stewing dried raspberries in water, adding sugar to make the drink palatable. It can be made of fresh berries by crushing them in a bowl and adding water and sugar to taste. Children are generally fond of drinks made in this way, and the variety is almost endless.

CHERRY DRINK.—Mash twelve or fifteen large sour cherries, stones and all, in a goblet, pour on water till the glass is two-thirds full; add loaf-sugar sufficient to suit the taste. This is a cooling summer-beverage, and an excellent diuretic. Persons suffering with gravel in the bladder are often greatly relieved by this beverage, only it should be made very strong of cherry-juice for them.

PLUM WATER.—Pour over half a pound of plums a quarter of an ounce of ginger (if approved), two quarts of water; boil till pulped, strain, boil again, skim well, and bottle for use. Keep cool.

GOOSEBERRY WATER.—Green gooseberries, served in the same way, make a good drink. The proportions are: gooseberries one pound; water, one gallon; ginger, one-half ounce; sugar, three-fourths of a pound.

MIXED CURRANTADE.—Mash one pound of ripe red currants with half a pound of ripe red raspberries; add a half pound of sugar and a gallon of cold water. Let it settle, and it is ready for use. If it is desirable to bottle it, strain. Dried currants and dried raspberries may be used, and so may currant jelly, if more convenient.

PURE CURRANTADE.—Press the juice from ripe currants, strain, add to each pint a pound of best white sugar; add cold water to taste. It makes a delicious beverage. Dried currants may be used, and thus the drink made at any season of the year.

A COOL GINGER DRINK.—Ginger is used almost universally as an addition to many drinks. There are those who would not allow it in the stomach, still, as the root contains no essential oil, and is slightly warming and carminative, it is not particularly objectionable. Gen

erally it agrees well with most stomachs. The following receipt for a mild ginger beer will not be amiss.

To six gallons of pure soft water put eight pounds of loaf-sugar, the whites of three eggs, well beaten, and three ounces best ginger. Powder the ginger finely, and mix with a little water before adding it to the mass. Boil gently for three-fourths of an hour, removing meantime the scum that rises to the surface. Let it cool, add the juice of three large lemons and a table-spoonful of yeast. Now put it in a cask and bung it very tightly, and let it stand for about ten days, when it will be fit to use.

RHUBARB TEA.—Boil two pounds of rhubarb stalks well sliced, for an hour in a quart of water, strain into a pitcher, add the juice of one lemon, and sugar to taste after it is cold. This makes a refreshing drink in the spring of the year.

APPLE TEA.—Peel, core, and quarter two pounds of apples, boil for half an hour in a quart of water, strain the liquor into a pitcher, add the juice of one lemon and loaf-sugar to taste.

DRIED APPLE BARLEY WATER.—Boil one pound of clean dried apples in one gallon of water for an hour. Boil a quarter of a pound of pearl barley one hour. Strain off the juice of the apples, add the barley water, put it into uncorked bottles, and keep for use in a cool place.

APPLE WATER.—Cut some very tart apples fine, pour over them boiling water, and let them simmer gently for half an hour. Strain off the liquor and sweeten to taste.

FIG WATER.—Boil a quarter of a pound of best preserved figs with a half ounce of ginger in two quarts of water. When reduced to a pulp, strain off and bottle for use.

BARLEY WATER.—Boil half a tea-cupful of the very best pearl barley in a quart of water till it is smooth, then strain it off into a mug, add the juice of a large lemon and loaf-sugar to the taste. The barley water should be strained through muslin before adding the lemon juice.

TOAST AND WATER.—Fill a quart-pitcher with boiling water. Drop into it a slice of bread toasted very brown. Let it stand till cold. Remember, drop the bread in instead of pouring the water over it, otherwise it will be cloudy instead of clear and beautiful.

FRUIT JUICES.—The juice of the apple and pear, says Mr. Knight, may be used to great advantage in preparing a beverage. He has frequently, he says, reduced it by boiling to the consistence of a weak jelly, in which state it has remained several years without the slightest apparent change, though intentionally exposed to variation of temperature. A large quantity of the inspissated juice would take up but little space, and the addition of a few spoonfuls to a quart of water would at any time form a delicious, wholesome, refreshing drink, free from all intoxicating properties. Its cheapness would be greatly in its favor. On sea voyages it would be a great luxury. We suggest experiments with it in the field of domestic economy

SUMMER BEVERAGES.—Take the genuine jelly of any fruit you like, dissolve it in water, sweeten to taste, and keep in a cool place; or if you have the fresh fruit, currants, raspberries, strawberries, cherries, grapes, bruise them in water, strain and sweeten. Keep in a cool place, and use as needed. Such drinks on ice will keep for several days.

CAPILLAIRE.—Take fourteen pounds of sugar, break into it six eggs with the shells. Stir into it gradually three quarts of water. Set it over the fire and boil it, taking off the scum until only a light froth rises. Add one gill of orange-flower water, and two or three drops of vanilla; strain through a jelly-bag, and when cold bottle it, corking tightly. A wine glass in a tumbler of water is very refreshing. You may add to it slices of lemon, pineapple, crushed currants, or strawberries, as suits the taste and season.

EAU SUCRE.—Water, with sufficient sugar to make it sweet, is a common beverage in France, and there considered very wholesome and refreshing. Ladies generally take it before bedtime. It may be useful in some cases, but should not be used too freely.

GRAPE DRINK.—This is one of the most delicious and refreshing drinks ever devised by thirsty mortals. It is made of nearly ripe grapes pounded, loaf-sugar, and water. It is strained until it becomes of the palest straw-colored amber, and then frozen. Delicious drinks may be made from grapes by stewing with sugar and water. We leave the reader to use his or her own ingenuity in devising them. The fermented juice of the grape bears no comparison with these pure, simple, delicious beverages.

ICES.

CREAM SHERBET.—Put the yolk of six eggs and a dessert-spoonful of orange-flower water into two quarts of cream. Boil it up once in a covered stew-pan, then strain it. Add three-fourths of a pound of fine loaf-sugar, and stir till dissolved. When cold set it in ice, or freeze same as ice cream.

LEMON SHERBET.—Dissolve a pound and a half of loaf-sugar in a quart of water, take nine large lemons, wipe them clean, cut each in halves, squeeze them so as to get out both juice and some of the essence of the peel, stir into it the sugared water, strain and freeze same as ice cream.

STRAWBERRY SHERBET.—Take one pound of best ripe strawberries, crush them to a smooth mass, then add three pints of water, the juice of one lemon, and a tablespoonful of orange-flower water. Let this stand three or four hours. Then put into another basin a pound of best refined sugar, stretch over it a cloth or napkin, and strain on the sugar the berries, squeezing out the juice as much as possible. Stir until the sugar is dissolved, then strain again, and set in ice an hour before serving, in small tumblers.

M I L K.

MILK is a liquid food in a much higher sense than water. A pound of new cow's milk contains:

1. Six drachms or three-fourths of an ounce of sugar.
2. Four drachms or half an ounce of butter.
3. Six drachms or three-quarters of an ounce of cheese
4. Two drachms or one quarter of an ounce of mineral salts.
5. Thirteen and three-quarter ounces of water.

Milk makes a most perfect food and drink for the infant. It is also a very important food for other than children, It is of great service to invalids and the convalescent. It is true there are some constitutions with which it does not agree. Where this is the case, the objection may generally be obviated by skimming off the cream before using it. Even skim milk is very nutritious; it contains nearly all the valuable nourishment of new milk except the butter.

A MILK DIET.—Within a few years a milk diet has become a very popular prescription among physicians, they ordering patients to subsist on it for days or weeks at a time. In cases where the patient needs a good sustaining food without the risk of inflammatory action or excitement succeeding its use, a milk diet is perhaps the best regimen that can be chosen. This is especially true in all diseases affecting the respiratory organs, inflammations of the stomach, bowels, kidneys, and bladder. It is of benefit in cases of hemorrhage, and gout, and diarrhœa. In fevers it is much used. In convalescence from small-pox, scarlet fever, measles, typhoid fever, milk is often very serviceable. I have found gems and milk very excellent after scarlet fever. Indeed, good home-made brown bread and milk is almost a perfect food, especially for feeble children suffering with scrofulous habit of body, mesenteric diseases, spinal affections, fits, taint of the blood. I even go so far as to say that all children would be the better for taking one meal of brown bread and milk daily, and feeble ones should use it three times a day.

In ulceration of the stomach or bowels, milk is very serviceable. The case reported in the *Herald of Health* for August, 1873, of Mrs. Sara B. Clase, is in point. After nearly two years' suffering of untold agony from ulceration of the stomach, she was cured by a milk diet. She began by taking a teaspoonful every hour, and adhering to it alone for nearly a year, except the amount was increased as the strength returned. The greatest fear is in taking more than the stomach in its weakened condition can manage. I commend a study of this case to all suffering from ulceration or cancer of the stomach.

In diabetes an exclusive milk diet has been found to work wonders. It must be persevered in methodically and exclusively until convalescence is established. It is well known that in this ugly disease the great danger is that the starch of the food is converted into sugar, and as such passes out of the system without yielding any of its force to the body. Dr. Arthur Scott Duncan, of England, says, "the rapidity with which milk acts is truly surprising. Twenty-four hours

being sufficient to produce a marked change, the quantity and density of the urine suddenly falling, thirst and appetite disappearing, the skin becoming moist and perspiring, sleep improving." Dr. Karell reports two hundred cases treated by milk alone, among which were many remarkable cures.

For the aged, milk, or bread and milk, offers advantages worthy of their serious attention. The great Professor Black adopted it for many years before his death, because he thought it ought to be the natural food of an aged man in his second childhood. He died with a bowl of milk in his hand, so quietly that not a drop was spilled.

Dr. George W. Balfour has found an exclusive milk diet to be very beneficial in asthma after it had resisted other means of cure for years.

Boiled milk is digested in two hours; raw milk in two hours and a quarter.

CHOICE OF MILK.—Cow's milk differs greatly in quality, some being rich and other thin and watery. In choosing a family cow it is well to bear this in mind, and to select only those that are healthy and give the very best milk. They should also be fed on the best of food, and allowed pure soft water to drink. The practice of feeding cows on garbage, swill slops, distillery feed, and of keeping them confined in close, filthy, unventilated stables, is one which seriously deteriorates the milk, and should ever be avoided.

Those who live in cities cannot of course keep cows, and so they must depend on the market for their supply of milk. In large cities such cannot do better than to use condensed milk, if they can get it. It has been used in our institution for many years with very satisfactory results. In preparing it the animal odor is evaporated, and it can be made as rich as is desired. It may be diluted for babes if necessary. Of course we do not speak of the condensed milk put up in cans, but that prepared for supplying the market for immediate use.

If condensed milk cannot be obtained, and you cannot keep your own cow, then insist on having the best article, and refuse to use that from distillery-fed cows, or that diluted with water. A little attention to this subject will enable any one to secure a good article. It is the laxity of purchasers of food in not demanding the best that makes it so easy for the dealer to palm off adulterated and inferior articles upon thoughtless people. If the poor would do this, it would improve their own and their children's health wonderfully. The milk supply of a city has a great deal of influence for good or evil on the health of the children. In England, this question is getting to be a very important one. The *Food Journal* says that "perhaps the most serious and destructive change in the nutrition of the poor is their almost total privation of milk. Infantile sickness and mortality depend largely on this want." There the occupation of mothers in factories and workshops deprives many thousands of infants of their natural food—breast milk.

PREPARING COW'S MILK FOR BABES.—In this connection I wish to give explicit directions for preparing artificial human milk for babes

It is well known that cow's milk is far richer than human milk. It contains more curd, more cream, more mineral matter, and less water. Compare the following table with the one at the beginning of this paper. One pound of human milk contains :

Sugar.....	4	drachms	and	40	grains.
Butter.....	3	"	"	30	"
Curd.....	3	"	"	30	"
Mineral salts.....				41	"
Water.....	14	ounces	and	41	"

It may not be well known why cow's milk so often disagrees with babes. A principal reason is that in the stomach the curd forms in harder lumps and is not easily acted on by the gastric juice, whereas human milk forms a flocculent soft curd which readily absorbs the gastric juice, and is acted on by it with great ease.

The question is how to modify cow's milk to make it suitable for a new-born infant ; it having been found to disagree in its pure state.

There is in the first place too much casein, or cheese, in cow's milk, and the child cannot digest it ; to reduce it to the true proportion, nearly twice as much water as milk is necessary ; to be exact, it must be eighteen parts of water to ten parts of milk ; but this would reduce the quantity of butter also, without which the child would not thrive. The milk to be diluted must therefore contain more butter than ordinary milk, which must be obtained by setting aside, say, three quarts of milk, and at the end of four or five hours remove the upper quart ; the upper third of any quantity of milk containing fifty per cent. more butter than the ordinary milk of the cow. The same result can be obtained by taking the "strippings," or latter part of the cow's milking. This milk, when diluted with one and a half parts water, and properly sweetened, resembles ordinary human milk.

VARIOUS DILUTIONS FOR VARIOUS AGES.—Mother's milk for new-born babes is so peculiar as to have got a special name, *colostrum*. It gradually loses these peculiarities. For colostrum, or milk prepared for the first two weeks of a child's life, must contain more butter—the upper eighth, instead of the upper third, must be used. From two quarts of milk, which has stood four or five hours, skim off carefully half a pint ; or the last tenth of milk just stripped from a cow. For example, if a cow gives five quarts, the last pint may be used. This milk must be largely diluted with water, according to the following schedule.

SCHEDULE.

AGE.		MILK.	WATER.	WHOLE QUANTITY.
		<i>Gills.</i>	<i>Gills.</i>	<i>Gills.</i>
2	to 10 days.....	1 $\frac{1}{4}$	3 $\frac{1}{4}$	4 $\frac{1}{2}$
10	to 20 days.....	1 $\frac{3}{4}$	4 $\frac{1}{4}$	6
20	to 30 days.....	2 $\frac{1}{2}$	6	8 $\frac{1}{2}$
1	to 1 $\frac{1}{2}$ months.....	3	6 $\frac{1}{2}$	9 $\frac{1}{4}$
1	to 2 months.....	3 $\frac{1}{2}$	7	10 $\frac{1}{2}$
2	to 2 $\frac{1}{2}$ months.....	4	7 $\frac{1}{2}$	11 $\frac{1}{2}$

AGE.	MILK. <i>Gills.</i>	WATER. <i>Gills.</i>	WHOLE QUANTITY <i>Gills</i>
2½ to 3 months.....	4½	7½	12
3 to 3½ months.....	5	do.	12½
3½ to 4 months.....	5	do.	13
4 to 4½ months.....	6	do.	13½
4½ to 5 months.....	6½	do.	14
5 to 6 months.....	7	7	14
6 to 7 months.....	7	7	14
7 to 8 months.....	8	6	14
8 to 9 months.....	8½	6	14½
9 to 10 months.....	8½	6	14½
10 to 11 months.....	8½	6½	14½
11 to 12 months.....	9	5½	14½

Eight large spoonfuls are about a gill.

REGULATIONS OF THE QUALITY OF THE MILK.—If the milk be too strong, indigestion will follow, and the child will lose instead of gaining strength. When particles of casein, or curd, pass through his bowels unaltered, a milder quality or lower grade should be substituted. A feeble child of six months may require the food suited to a vigorous child of six months. For constipation, increase the richness of the milk, put in more cream. In cold weather, or if milk is kept on ice, it may stand an hour or two longer before the upper third is removed; or the upper fourth may be taken; or set five quarts instead of three to get one quart.

The water used in diluting milk should not be hard; nor should it be boiled. Add it to the milk, and heat it by putting the bottle in warm water.

SWEETENING.—Use loaf sugar enough to make it as sweet as undiluted new milk, a teaspoonful to a quart. If too sweet, it will cloy the appetite, and not enough food will be taken.

TEMPERATURE.—The milk should be heated to one hundred degrees Fahrenheit; test it once, and try it on the cheek; which should regulate it subsequently.

QUANTITY.—For the first ten days, about one to one and a half pints a day should be given; before the end of the first month the child will take more than a quart daily; at the age of three months he may require two quarts daily. After that time the quality will change more than the quantity. The child will need half a pint at a time every three or four hours, which should be sucked in about ten minutes, and he will pass six or eight hours at night without feeding.

The bottles should be annealed by being put into cold water and boiled three or four hours, and the most scrupulous care observed in cleaning them.

We have made out a scale of dilutions for one year, but the mother may, after the child is six months old, find it necessary to use more

milk and less water, in which case she will dilute less. If the child manifests symptoms of malnutrition on this food, it is evident that its food should be rendered more nourishing. We are indebted to Dr. Corson for the demonstration of the practical utility of beginning our trials with pure cow's milk, since the principal inconvenience which is found to occur is the regurgitation of a part of it; while, on the other hand, the infant runs the risk of starvation, or at least of numerous diseases, before any notice is taken of the deficiently nutritious quality of milk and water. If he succeeds in his object "of directing attention to the fact that many thousands of children annually die prematurely from want of food," he will have accomplished a great work; but if he proposes to give all children pure cow's milk, without reference to its agreement or disagreement with their stomachs, he will have fallen into the same error with those who confide exclusively in milk and water.

OATMEAL MILK.—I cannot help in this connection printing the following letter from one of my correspondents, regarding oatmeal milk for young children; which I am sure will help some mother to rear to health a child when she might otherwise fail. I may add, however, that it should not be used before the babe is three or four months old, and then a gradual substitute for the breast. She says:

"When my baby was five months old, for the sake of my own health, I weaned him from the breast. I gave him cream and water, with a little sugar. In two weeks' time his bowels were so constipated that I fully realized that some change must be made in the food. I, therefore, made oatmeal gruel by boiling oatmeal in about twice the usual quantity of water for an hour and a half or two hours. When properly cooked, I poured it through a fine sieve. The part which passed through was, when cold, of the consistency of jelly. Then, in a quart cup, I mixed one half pint of thin cream and oatmeal gruel—about one gill of each—added one teaspoonful of white sugar, and filled the measure nearly full of boiling water. This food he relished, and in every way it agreed with him; and if there ever was a child that grew any faster than mine did when fed with oatmeal and milk, I think it would be a wonder. People would say: 'How your baby grows,' and in the same breath (when I told what his food was), would say: 'Why, you'll starve him!' But by putting in less water I found it was too hearty, causing him to vomit; and once in possession of the key to my child's health nothing turned me aside.

"My child is now a year and a half old, his food is three parts milk and one part gruel. He is very large, strong and active, has twelve teeth, weighs thirty pounds, and in all the time has not lost an ounce of flesh, even at the most trying time—warm weather.

"That I am enthusiastic in regard to oatmeal milk should not seem strange, and I wish that, of the many mothers throughout the land, those who find it necessary to provide other than the natural food for their children would try my recipe. They would find doctors' visits few and far between."

RECIPE FOR GRUEL.—One teacup oatmeal, two quarts of hot water Boil two and a half hours. Strain through a fine sieve.

I prefer this way to the plan of soaking the oatmeal in cold water, which I have tried, but find that the taste is not so pleasant.

SKIMMED MILK.—Skimmed milk, according to analysis, is not greatly inferior to new milk, except in the amount of butter it contains ; as will be seen from the following :

100 parts new milk—water, 86 ; nitrogenous, 5.5 ; sugar, 3.8 ; fat, 3.6 ; salts, 0.66. 100 parts skimmed milk—water, 88 ; nitrogenous, 4.0 ; sugar, 3.8 ; fat, 1.8 ; salts, 0.8.

The effect on Dr. Smith of eating one pint of new milk was to increase the exhalation of carbonic acid 2.26 grains per minute. It also gave an increase of air inhaled of 96 cubic inches in one minute ; skimmed milk, on the other hand, gave an increase to carbonic acid exhaled of 84 grains per minute and 21 cubic inches in the inspired air. Much is said in these days regarding the food qualities of alcoholic drinks, but Dr. Edward Smith, in his experiments on the best brandy as food, found that instead of an increase of vital action by the exhalation of more carbonic acid and the inhalation of more air, that there was a diminution of both. In other words, vital action was diminished instead of increased, and this was the result with nearly all the alcoholic drinks tested. And in those cases where vital action seemed increased, it was in a very slight degree, not one-fifth so much as shown above in the use of milk. Ten grains of milk consumed in the body produces heat sufficient to raise 1.7 lb. of water 1° F., and this is equal to raising 1.246 lb. one foot high. Can alcohol consumed in the body do this?

CAUTIONS REGARDING THE USE OF MILK.—While good milk is an excellent article of food for the young, the aged, and many invalids, it may be the means of spreading dangerous diseases. That which is sent to cities may have received infection from the air of the dairy-house, and in this way scarlet and typhoid fevers sometimes be propagated. But a greater source of danger is in the water that the dairyman mixes with it. If the water is pure, of course the injury lies only in the less amount of nourishment it contains ; but if water is used from wells or springs not pure, then the danger is very great. In England numerous instances have come to light where a large number of families supplied by the same milkman have had typhoid fever, and on careful investigation it was found that the dairyman had in these cases watered his milk from a well-pump in the yard, into which there was a slight leakage from a drain. Through this leak had oozed the poisonous germs that poisoned the milk, and carried that most dangerous malady into forty-seven families, destroying one hundred and sixty-five persons. Thanks to the spirit of investigation which sought and found the source of the contagion. Still another source of danger in the use of milk is where the child is nursed by a diseased mother, or one subject to fits of passion, or where the mother has been poisoned by food or medicine. We mention these things that all may be on their guard, and be able to avoid causes of disease that lurk in unsuspected and hidden places.

CREAM.—Cream is a liquid food of great richness, especially in fat, and pure would be too hearty to be used as a food to any great extent ;

but mixed with milk it forms a very agreeable, even delicious drink, and for persons thin in flesh and run down in health it may often serve important uses, especially if it agrees with the stomach. Pure cream contains,

Water.....	66.00 parts	|	Sugar.....	2.8 parts
Nitrogenous.....	2.7	“	Fat.....	26.7

A mixture of cream and milk and oatmeal forms a very nourishing diet for consumptives, and those with little animal heat, also for those who use little or no animal food.

BUTTERMILK.—This liquid food is not much used by Americans, but the Germans regard it with great favor. It contains about as much nourishment as skim milk. It is poor in heat-giving qualities, but there is considerable nitrogenous matter in it. Here is the analysis :

Water.....	88.0	|	Sugar.....	3.6
Nitrogenous.....	4.1	|	Fat.....	0.7
Salts.....				6.8

It also contains lactic acid, which is believed to favor digestion. In some forms of disease a buttermilk diet is found to be serviceable. It is better adapted to the fat than the lean, and to those who have a superabundance of animal heat than to those who suffer with cold feet and hands and languid circulation.

TEA.

So much has been written on the use of tea, pro and con, that little new can be said. Nevertheless there are some points concerning this question not yet well understood. They are as follows :

1. Tea is not nutritious. The milk and sugar put into the cup to give it flavor has a real value as a food.

2. Nearly all teas, whatever their price or name, are about of equal value so far as their physiological effects are concerned. The higher priced sorts have, however, a much more delicate flavor, and for this reason will always be preferred.

3. That tea should, when used, be weighed rather than measured, as some kinds weigh more to the teaspoonful than others. Oolong, for instance, weighs 40 grains to the teaspoonful, Congou weighs 87, and gunpowder tea weighs 125 grains to the teaspoonful.

Then, too, the effects of tea are not well understood.

1. Tea increases the amount of carbonic acid expired from the lungs.

2. It increases the volume of air inspired, but not the rapidity of respiration, consequently it must increase the depth of inflation of the lungs.

3. Tea tends to induce perspiration, especially if taken hot.

4. Tea excites to increased action the muscular system.

5. Tea powerfully excites the nervous system.

The points last enumerated accord with the experience of a majority of tea-drinkers, and if the subject were dropped here, the impression would be very favorable to the use of this beverage. There is, however, another side to be considered. It has been found that

tea is not nutritious, and that it actually increases the waste of the system. From this it may be inferred that tea is not a good drink for those who are dyspeptic and nervous, or those in which the waste of tissue is already more rapid than the supply. Dr. Edward Smith puts it in this way: "Tea increases waste, since it promotes the transformation of food without supplying any nutriment, and increases the loss of heat without supplying fuel. It is, therefore, specially adapted to those who eat too much, when the process of assimilation should be quickened, but is less adapted to the poor, the ill-fed, and during fasting."

Dr. Smith also gives the following as the generally admitted effects of tea:

1. A sense of wakefulness.
2. Clearness of mind and activity of thought and imagination.
3. Increased disposition to make exertion.
4. Reaction, with a sense of exhaustion following the preceding effects and in proportion to them.

ANALYSIS OF TEA.—The active principle of tea is a substance called *theine*. One hundred parts of tea contain:

Theine	2.00	Starch	0.75
Casein	15.00	Fat	4.00
Gum	18.00	Vegetable fiber	20.00
Sugar	3.00	Mineral substances	5.00
Tannin	26.25	Water	5.00

The amount of *theine* varies from two to six per cent. The chemical formula for *theine* is $C^{16}. H^{10}. N^4. O^2 + H^2O$.

PRACTICAL HINTS CONCERNING THE USE OF TEA.—The following hints concerning the use of tea may prove useful:

1. Whoever uses tea should do so in great moderation.
2. It should form a part of the meal, but never be taken before eating, or between meals, or on an empty stomach, as is too frequently done.
3. The best time to take tea is after a hearty meal.
4. Those who suffer with weak nerves should never take it at all.
5. Those who are troubled with inability to sleep nights should not use tea, or if they do, take it only in the morning.
6. Brain-workers should never goad on their brains to overwork on the stimulus of tea.
7. Children and the young should not use tea.
8. The overworked and under-fed should not use tea.
9. Tea should never be drunk very strong.
10. It is better with considerable milk and sugar.
11. Its use should at once be abandoned when harm comes from it.
12. Multitudes of diseases come from the excessive use of tea, and for this reason those who cannot use it without going to excess should not use it at all.

TEA AND SICK HEADACHE.—The following, from the *Medical Investigator*, has an important bearing on the use of tea: "Dr. Gregg published an article in the *Homœopathic Quarterly* on tea, as a cause of

sick headache, worthy of the attention of those who suffer with this common malady. The doctor there alleges that this beverage is the cause of more cases of this disease than any other, if not than all other causes put together, and gives a number of instances where, after leaving off its use, persons who had previously been afflicted were exempt from further attacks. One evidence the doctor gives of the injurious effects of this agent is the fact that tea-drinkers are liable to have headache if they omit its use at the regular times of taking it, and the cessation of the pain on again resuming their cups. This latter, with many other facts contained in the article, have often been observed, not only on myself, but on others, for I had inherited the disease from my mother. It had been the plague of her life, as well as my own. We had both been not excessive but regular tea-drinkers; and though she lived to be over eighty years of age, she was never exempt from an attack, of greater or less severity, for more than a few weeks at a time, for a period of nearly or quite half a century. Knowing this fact, and that from my earliest recollection I had been similarly afflicted, I was content, when the pain returned, to relieve it with the appropriate remedies, with little thought or hope of ever being able to eradicate it. Some twenty years ago I had abandoned the use of coffee and green teas, using only the black and Japan. Pork, pastry, spices, acids, and most kinds of raw fruits were sure, if indulged in, to bring on an attack of my old trouble; and this weakness of the stomach seemed to be gradually on the increase, besides a train of nervous symptoms, such as sleeplessness, palpitation of the heart, unsteadiness of the hand when writing, etc., gave me no little annoyance. After reading the article referred to, I concluded, some three months ago, to use no more tea, substituting in its stead hot water with a little milk. The result, for the first week or ten days, was much as I had anticipated, being, during the whole of that time, scarcely ever free from headache. At length the pain became lighter, and when it did return was of short duration. My nervous symptoms grew less, palpitation left entirely, my stomach became much stronger. I can now eat with impunity many things which for years had been sure to disagree. The headache now very rarely returns, and never with severity; besides, within the past two months my weight has increased sixteen pounds."

TEA AND DYSPEPSIA.—Where there is any tendency to dyspepsia, tea aggravates it, and many cases are cured by disusing it. Dr. Corfe mentions a cure of supposed cancer of the stomach, cured by the disuse of tea. Dr. Milligan mentions a person who could never use tea without experiencing a disposition to commit suicide.

TEA-DRUNKARDS.—In closing what is to be said about tea, one word seems necessary in regard to tea-drunkards. Their number is legion; they are of both sexes, but more of women than of men. Instead of using tea in moderation, or as an occasional beverage, they swill it down three or more times a day, in quantities that are incompatible with health. They are as much slaves to the teapot as the drunkard is to his bottle. They are tea-drunkards. Tea, in anything but great moderation, is a poison capable of ruining the stomach, enfeebling and

disordering the heart's action, shattering the nerves, and ruining the health and happiness of the victim. In few words, without holding that the use of tea is as bad as the use of alcoholic liquors, one may well believe that the total abstinence reformers have, in their red-hot zeal against rum, encouraged an indulgence in tea-drinking which will one day have to be fought against with might and main, to prevent the wholesale ruin of multitudes. A tea-drunkard may be defined as one who drinks strong tea several times a day, who depends on it instead of food and rest for strength, and who cannot go without it without bringing on distressing symptoms.

COFFEE.

The active principal of coffee is called *caffeine*. An analysis of one hundred parts of raw coffee shows the following to be its composition :

Caffeine	1.00	Mineral matter.....	6.07
Casein	13.00	Acids.....	5.00
Gum and sugar.....	55.05	Wood fiber.....	34.00
Fat.....	13.00	Water.....	12.00

Caffeine is analogous to theine in composition and effects.

Coffee produces effects very similar to tea, and the same general rules are applicable for its use. It, like tea, powerfully affects the respiration, increasing the quantity of carbonic acid expired and air inspired. Coffee differs from tea in its effects, by increasing the rate of respiration and not its depth, in increasing the rate of pulsation, and in diminishing the action of the skin. Those who suffer with dry skin, or palpitation of the heart, or heart disease, are particularly liable to harm from the continued use of coffee in large quantities. It is more suited to the wants of the poor and debilitated than tea, and is more appropriate for the breakfast meal than afterwards.

COCOA AND CHOCOLATE

Cocoa and chocolate have, for their active principle, the obromine, a substance very similar to caffeine and theine. The formula for theobromine is C.⁷ H.⁸. N.⁴. O.².

The analysis of the cacao bean gives in 100 parts :

Theobromine.....	0.56	Extractive matter.....	4.14
Cacao.....	6.61	Humic acid.....	7.25
Cacao butter.....	36.97	Woody Matter.....	30.00
Gluten.....	3.20	Salts... ..	3.00
Starch.....	0.55	Water.....	6.01
Gum.....	0.69		

Dr. Edward Smith, to whose work we are largely indebted for our knowledge of tea, coffee, and cocoa, says of the latter substance : " Its action is less exciting to the nervous system than tea or coffee, and at the same time it contains a much larger portion of nutritive material. Boiled in milk, it may produce a most agreeable and nutritious food, and for very many persons is greatly to be preferred to tea or coffee."

METHODS OF PREPARING TEA, COFFEE, AND COCOA.

TEA.—The theine of tea is without flavor. This depends on the aroma, which should all be extracted from the leaf. The dried juices of the leaf, on the other hand, should not be extracted further than to give body to the drink, otherwise it will be bitter and the aroma will be covered up or hidden. The best rule to secure the aroma and not too much of the body is to put the tea into hot water, and keep it at or near the boiling point for five minutes. If cooked longer than this the aroma will be dissipated, more theine will be extracted and the tannin, which makes tea bitter, will be in excess. The best water for tea is pure spring-water. It should be fresh and used immediately after boiling. After the tea is cooked it should be strained and kept hot till used.

COFFEE.—Soyer's mode of making coffee was to warm the powder over the fire first, then to pour the boiling water over it; cover it closely for five minutes, strain it, and boil again for use. French coffee is made by adding a pint of made coffee to a pint of boiling milk and warming them both together, but not letting them boil too long.

CHOCOLATE.—Cut a cake of chocolate in very small pieces, boil a pint of water, when it is at the boiling point add the chocolate; mill it off the fire till quite melted, then place it on a gentle fire till it boils. Pour into a basin and it will keep for ten days. When required, put a spoonful or two into fresh milk. boil it with sugar and mix well. Mill to a fine froth and serve.

COCOA.—It made from the ribs, boil a quarter of a pound of them in three quarts of water to two quarts and a half. The ribs to be strained after five hours' boiling. If made from paste or powder, use one and a half teaspoonful of cocoa to a cup of boiling milk. Sugar to taste. Or one and a half teaspoonful of cocoa, three quarters of a cupful of boiling water. Sugar to taste and fill the cup with milk.

CONCLUSION.

SOME hygienists will find much fault that we have not condemned entirely the use of tea and coffee, but though we never use them ourselves, we have thought best to give the results of late scientific studies on the subject, and such cautions regarding their use as will enable those who do use them to do so with as little harm as possible. If asked what is the proper amount of these drinks for each day, we should say, do not exceed one cup of tea or coffee, and at farthest two of cocoa or chocolate.





THIS BOOK IS DUE ON THE LAST DATE
STAMPED BELOW

AN INITIAL FINE OF 25 CENTS
WILL BE ASSESSED FOR FAILURE TO RETURN
THIS BOOK ON THE DATE DUE. THE PENALTY
WILL INCREASE TO 50 CENTS ON THE FOURTH
DAY AND TO \$1.00 ON THE SEVENTH DAY
OVERDUE.

ICLF (N)

NOV 5 1955

INTER-LIBRARY

LOAN

JUN 16 1966

DEC 10 1996

REC'D BIOS

DEC 04 '96 - 10 00 AM
SENT ON ILL

JUN 13 2002

U. C. BERKELEY
SENT ON ILL

JUL 15 2002

U. C. BERKELEY

LD 21-100m-7,'33

YB 15101

U. C. BERKELEY LIBRARIES



C057917181

TX353
H6

15101

