



THREE WAYS

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ALTH

Doctor H. C. Menkel

# THREE TO HEALTH

*By*

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## Keeping Well Without a Doctor

**S**AID a physician long ago: "If we would all learn how to breathe properly, to live in the fresh air day and night, to bathe daily, and to drink eight glasses of water every day,—two before breakfast, two during the morning, two during the afternoon, and two before going to bed,—the doctors would be out of business. In these things lie health: only they are so cheap, so easy to be had, that we do not place the right value on their wonderful properties."

We must, first of all, then, believe that a person cannot take too much fresh air, by day or by night. That means that we must empty the lungs of foul air as many times a day as we can. Whenever we are in the clear, open air we must pucker up the lips into a small hole as though we were going to whistle, blowing out the breath thoroughly and letting the intake look after itself. A rubber ball, when you squeeze it and then let it go, will fill up immediately with new air; so the lungs will immediately fill up again by simply blowing out the contained air.

Learn to breathe intelligently. To expand the chest and breathe deeply is the first rule. The next is to keep out in "the open" as much as circumstances will permit, and to allow, at any cost, the fresh air constantly to circulate in our rooms and houses, and in the places where we work, never entirely shutting it out of any room. At night open the windows generously, not an inch or two, but all the way, letting in plenty of outdoor air, remembering always that you cannot let in too much fresh air!

All this will seem plausible and worth trying to many people during favourable weather. Unfortunately, to most

of us, rain or any sort of inclement weather, means dampness and consequent danger. This theory is also fallacious. So strongly rooted and deep seated has it become, however, that it will take a long time to upset it. We forget that the air is always purer when it rains or snows, that the very moisture we dread is beneficial because it absorbs any dust that may be floating in the air. If you doubt this, fill a cup with rain water some time and look at it through a microscope, or melt a cupful of snow; and the truth will be revealed to you. It does us absolutely no harm to go out in the wet, provided we are well shod and well clothed. And if we happen to get wet, we must keep in motion until we get opportunity to change our clothes and shoes and stockings. This is the only precaution we must observe. Yet thousands of intelligent people cannot shake off this old-fashioned, deep-rooted fallacy that fresh air and cold water are dangerous of themselves. The danger is in an improper mode of life which renders us over-susceptible to what does not hurt vigorous people.

Colds come from overeating, from allowing the pores of the skin to become clogged, and the eliminative functions to be choked. If we eat moderately and use plenty of water inside and out, we shall avoid nine tenths of our "common colds." Wash inside and out: that is a rule to live by. Many of us wash the outside quite right enough, but the equally important rule to wash ourselves inside rarely occurs to us. Here is where pure, clear water comes in, and if there is any doubt about your water supply, buy some pure, good water. It will be one of the best investments you ever made for your health. Directly upon rising, drink at least two large glasses of water, cold or warm, as you prefer. Many people do this and stop there. But that is not enough. See to it that during the morning between the hours of ten and twelve you drink two more glasses, provided you lunch at one o'clock. Theoretically, you should not drink for an hour before, or until an hour

after, eating. Do not drink anything with your meals. Then, in the afternoon, between two and four or five o'clock, drink two more glasses of water; and two more just before you retire. You would thus have consumed eight glasses of water during the day, which quantity every man, woman, or child should drink—not less. Then the system will be well flushed out and kept clean.

Seize upon every opportunity to keep out in the open air. If your work is confining, and you can do no more, put your head out of a window as many times a day as you can, and give the lungs a good blowing out in the way already indicated. Walk instead of riding whenever you can, whether you feel like it or not. On all occasions, walk, exercise, play; do something in the open, if it is only to sit in the sun and take a sunbath. There are few things better for you. Whenever you can, sleep in the open. This is not only for tuberculosis patients; it is good for us all. But let us get one point correctly fixed in our minds: that the greatest tonic that God has given us is fresh air, whether it be cold or warm, rainy or sunny, snowy or murky. It is always healthful, and the finest element we can take into our systems.

“God sent His creatures light and air  
And water open to the skies.  
Man locks him in a stifling lair,  
And wonders why his brother dies.”





## PART ONE

# Exercise

### THE NECESSITY OF ACTION

**A**CTION is a law of our being. Every organ of the body has its appointed work, upon the performance of which its development and strength depend. The normal action of all the organs gives strength and vigour, while the tendency of disuse is toward decay and death. Bind up an arm, even for a few weeks, then free it from its bands, and you will see that it is weaker than the one you have been using moderately during the same time. Inactivity produces the same effect upon the whole muscular system.

“Inactivity is a fruitful cause of disease. Exercise quickens and equalizes the circulation of the blood, but in idleness the blood does not circulate freely, and the changes in it, so necessary to life and health, do not take place. The skin, too, becomes inactive. Impurities are not expelled as they would be if the circulation had been quickened by vigorous exercise, the skin kept in a healthy condition, and the lungs fed with plenty of pure, fresh air. This state of the system throws a double burden on the excretory organs, and disease is the result.

“Invalids should not be encouraged in inactivity. When there has been serious overtaxation in any direction, entire rest for a time will sometimes ward off serious illness; but in the case of confirmed invalids, it is seldom necessary to suspend all activity.

“Those who have broken down from mental labour should have rest from wearing thought; but they should not be led to believe that it is dangerous to use their mental powers at all. Many are inclined to regard their condition as worse than it really is. This state of mind is unfavourable to recovery, and should not be encouraged.

“Ministers, teachers, students, and other brain workers often suffer from illness as the result of severe mental taxation, unrelieved by physical exercise. What these persons need is a more active life. Strictly temperate habits, combined with proper exercise, would ensure both mental and physical vigour, and would give power of endurance to all brain workers.

“Those who have overtaxed their physical powers should not be encouraged to forego manual labour entirely. But labour, to be of the greatest advantage, should be systematic and agreeable. Outdoor exercise is the best; it should be so planned as to strengthen by use the organs that have become weakened; and the heart should be in it; the labour of the hands should never degenerate into mere drudgery.

“When invalids have nothing to occupy their time and attention, their thoughts become centred upon themselves, and they grow morbid and irritable. Many times they dwell upon their bad feelings until they think themselves much worse than they really are, and wholly unable to do anything.

“In all these cases, well-directed physical exercise would prove an effective remedial agent. In some cases it is indispensable to the recovery of health. The will goes with the labour of the hands; and what these invalids need is to have the will aroused. When the will is dormant, the imagination becomes abnormal, and it is impossible to resist disease.

“Inactivity is the greatest curse that could come upon most invalids. Light employment in useful labour, while

it does not tax mind or body, has a happy influence upon both. It strengthens the muscles, improves the circulation, and gives the invalid the satisfaction of knowing that he is not wholly useless in this busy world. He may be able to do but little at first, but he will soon find his strength increasing, and the amount of work done can be increased accordingly.

“Exercise aids the dyspeptic by giving the digestive organs a healthy tone. To engage in severe study or violent physical exercise immediately after eating, hinders the work of digestion; but a short walk after a meal, with the head erect and the shoulders back, is a great benefit.

“Notwithstanding all that is said and written concerning its importance, there are still many who neglect physical exercise. Some grow corpulent because the system is clogged; others become thin and feeble because their vital powers are exhausted in disposing of an excess of food. The liver is burdened in its effort to cleanse the blood of impurities, and illness is the result.

“Those whose habits are sedentary should, when the weather will permit, exercise in the open air every day, summer or winter. Walking is preferable to riding or driving, for it brings more of the muscles into exercise. The lungs are forced into healthy action, since it is impossible to walk briskly without inflating them.

“Such exercise would in many cases be better for the health than medicine. Physicians often advise their patients to take an ocean voyage, to go to some mineral spring, or to visit different places for change of climate, when in most cases if they would eat temperately, and take cheerful, healthful exercise, they would recover health, and would save time and money.”—“*Ministry of Healing*,” pp. 237-240.

The best and most effective exercises are those which most nearly correspond to the normal movements and efforts associated with the duties of daily labour, such as working in the garden, the movements necessary for chopping wood, digging with pick and shovel, the movements of the *dhobi* in washing the clothes, the efforts and attitudes associated with lifting heavy articles, or reaching to lay hold of and pull down something offering resistance.

In all of these efforts the effect of the movement can be varied and increased by resisting one group of muscles by its opposite number. Watch these different types of work being performed and then apply the same movements, putting resistance into the effort by voluntary muscular opposition. For such exercises no apparatus is necessary, as one simply opposes one set of muscles by another.

Another plan is to have a small bag containing sand weighing two and a half or three pounds to begin with, and using this in executing the different movements. The weight can be increased as may be necessary.

The peasant and the labourer in any outdoor occupation do not require "exercises," this need being met in the performance of their daily duties, and when night comes there is no necessity for sleeping potions. Nature, whom they serve, takes care of all this.

In these days many of us live in cities, sit at desks, or spend long hours serving in factories, shops, banks, and other such urbanized pursuits. We take the lift instead of going up the stairs. The motor car carries us from where we were last sitting to the next chair awaiting our occupancy. These altered circumstances give rise to the need for certain "exercises" which can be taken conveniently within limited space and time. The following series have been selected from the book, "Home Health," to meet this need:—

## STRENGTHENING THE NECK

The necessity for a strong, vigorous neck is not widely appreciated. Yet it is one of the most important regions of the body.

The position of the head is determined by the neck, and if held correctly has an influence for good upon the circulation, the cervical central nervous system, the sympathetic ganglia, and even the larynx and the œsophagus. The well-held head puts all these parts into proper position.

This group of simple exercises for the neck, head, and stretching of the spine should be practised daily.

1. Lie flat on the floor, with the arms at the sides. Count four slowly, raising the head on count one, without raising the shoulders from the floor. Bend the head as far forward as possible until upright on count two, lower slowly while counting three and four.

2. Stand erect, arms at the sides. Count four, inhaling slowly while tilting the head backward as far as possible gently. Stretch the throat while taking the head back, and when returning stretch the spine, as you pull the head forward as low as you can. Repeat until tired.

3. Stand erect, as before, and rotate the head, beginning by lowering the head forward to the chest, rotating slowly to the left side, repeating the rolling movement around to the back, and on to the right side, and back to front position. Repeat in the opposite direction.

4. Thrust the head forward with the chin protruding forward. Pull in the chin as far back as possible. Repeat until tired.

5. Hold the hands tightly clasped behind the head, with the head held erect. Now pull the hands down and forward with a strong movement. Repeat and pull the head backward, resisting with the hands.

## STRONG AND BEAUTIFUL SHOULDERS

A manly man is known at once by the set of his shoulders. In a woman there can be grace as well as strength in well-developed shoulders. Weak and undeveloped shoulders can be improved by systematic exercise. Bulging, flabby ones can also be made shapely by the same means.

1. Stand erect. Feet together. Place your hands on your shoulders, with the fists clenched, and your elbows pointing forward. Counting four slowly, touch the elbows in front, and then pull them sideways with a strong movement as far back as possible, keeping your hands on your shoulders. Repeat eight times.

2. Raise both arms above the head, elbows rigid, palms facing in. Now circle both arms in windmill fashion, by bringing them down in front, up at the sides, and back to position. If the arms are circled alternately, a wider sweep behind can be reached. Repeat eight times.

3. Hold the arms out at the sides on a level with the shoulders. Make a small circling movement, working the arms forward, down, up, and back to position. Repeat in the opposite direction. Repeat eight times.

4. Have the arms by your sides for this exercise. Shrug the shoulders up with a strong lifting movement, and bring down again, and *back* into a good position. Repeat eight times.

5. Keep the arms at the side and rotate shoulders with a circular motion in a big shrugging movement. The shoulders should take the lead in this movement, the arms remaining passive.

6. Bend the arms at the elbows, bringing the forearms level with the chest, finger-tips meeting. Now circle the forearms up over the head and touch the finger-tips at

the back of the head. The upper part of the arm must be passive. Now press back the head, and at the same time push the elbows well back with a strong movement. This exercise will reduce prominent shoulder blades. Repeat eight times.

### TOWARD A FLEXIBLE SPINE

To brace up the shoulders, hold the head high, and straighten the back, seem to bring new courage to face life's difficulties and give one a new sense of self-respect.

If you desire to cultivate a free-moving spine, begin by practising these simple exercises; doing them just a few times to begin, and increasing the number as strength and efficiency are gained.

*Trunk forward bending.* When vigorously performed with the knees rigid, these exercises stretch the posterior leg muscles, tendons, and ligaments. They greatly assist in achieving good posture, suppleness, and improved elimination.

1. Stand erect. Bend forward and touch the ground, at the same time raise the right leg behind. Repeat, raising the left leg.

2. Repeat the above exercise without the leg lift.

3. Stand erect, hands in front, fingers interlocked, and feet wide. Bend forward and try to touch the floor with the right elbow, keeping the left leg rigid, but bending the right leg. Repeat with left arm.

*Trunk turning.* This group has an excellent effect on the digestive processes, and aids the correct functioning of the liver, spleen, and kidneys. Spine twisting also acts beneficially on the sympathetic nervous system.

1. Stand erect, hands wide. Turn to the left slowly until the arms are reversed. Repeat in other direction.



2. Stand erect. Swing arms round to the left from the right side, as if holding a scythe, bending low. Repeat to right.

*Trunk side bending* (lateral trunk exercises). These stimulate the spinal cord and sympathetic nervous system, increasing the flexibility of the spine. The alternate compression and stretching of the organs stimulates the circulation.

1. Stand erect, feet together, hands high above the head, with fingers clasped. Bend to the right side as far as possible, then to the left.

2. Repeat the above, but sway in a circular direction, bending as far as possible.

3. Stand erect, hands down to the sides. Bend slowly to the right, letting the arms slide down the sides of the body. Repeat to the left.

### FOR SHAPELY ARMS

A well-developed, graceful arm is an asset to any woman who would be well-groomed; and for a man to be content with flabby, under-developed arms, or weedy "pipe-stems" is inconceivable.

The following exercises are suitable for both men and women, and may be practised daily in conjunction with the exercises previously given in this series.

1. Raise both arms out sideways with the palms facing upward. Now bend the arms at the elbows, clenching the fists. Rotate the upper arms backward. Repeat in the opposite direction. This exercise not only strengthens the upper arms, but also fills in "salt-cellars."

2. Hold the arms out in front, with the fists clenched. Turn the hands until the backs of the hands face inward. Repeat the twist in the opposite direction as far as possible. This exercise helps to fill out very thin arms.

3. Raise the arms sideways and rotate the clenched fists from the wrists only. This develops the muscles of the forearm and rounds out the contours.

4. Stand erect. Raise the hands across the chest. Fling out wide to sides. Repeat flinging movement with the arms above the head, then bring them down in a circular sweep to the knees.

5. Place the hands on a low table, leaning the weight of the whole body on the arms. Gradually lower your weight until the chin is touching the table, then raise the body until the arms are rigid.

6. Place two chairs back to back, and stand between them with hands resting on the backs. Now raise the body as high as possible with the full weight supported by the arms. Lower the body, and repeat.

### CHEST DEVELOPMENT

A well-developed chest spells good lungs.

To strengthen the lungs and ward off many pulmonary troubles, colds, etc., the muscles of the entire thorax should be exercised. The following list is useful for the development of these parts, and for inducing better breathing.

1. Lie flat on the bed or floor, with the arms extended in front in a folded position. Raise the chest as high as possible, pushing up with the head. Breathe deeply between each movement.

2. Lie on the right side with the head supported on the hand, the left hand resting on the bed. Push upward with a strong movement, raising the chest from the bed. Breathe deeply. Repeat on the other side.

3. Stand erect. Swing the arms up in front and out to the sides in one sweeping movement. Try to make the arms meet behind.



In the morning before dressing is a good time to practise mild gymnastics.

4. Clench the fists and raise to the centre of the chest. From this position force back the elbows until they nearly meet behind, raising the chest and holding the head well back.

#### STRONG LEGS

Seeing that nine tenths of the normal person's day is spent in walking or standing, the possession of straight, well-developed legs is of great importance.

To develop the various sets of muscles, outdoor sports such as climbing, swimming, tennis, golf, or running and sprinting, are all effective and very enjoyable.

To those whose legs need building up, and also to those who wish to hasten the development of any set of leg muscles, the following exercises are helpful.

1. Stand erect, with hands on hips. Bend the knees until nearly sitting on the heels. Then slowly rise. Repeat on one leg only, holding out the other in front. This is very difficult and too strenuous for beginners.

2. Stand before a chair or table and climb up with one leg as if about to stand on it; hold the position for a moment before returning to first position.

3. Recline on right side. Raise the body on one hand, and the outside leg. Lift the inside leg and swing back behind the knee. This is especially good for the adductor muscles.

4. Stand erect. Raise the right leg and swing it forward as high as possible. Do not bend the knee. Now take the leg backward as high as possible. Repeat with alternate legs.

5. Hop, raising the knees high, and touch alternate knees with the toe while springing in the air.

6. Deep knee bend, placing the feet in four different positions. First, feet together. Second, feet wide apart. Third, right foot one pace in front. Fourth, heel of the right foot to the toe of the left foot.

#### HOW TO AVOID WEAK ANKLES

The handicap of weak ankles can debar one from many sports, and be a hindrance to daily work.

The following exercises are useful to strengthen the extensor and tibial muscles which lie between the knee and the ankle.

1. Stand with the feet parallel, and about four inches apart. Rise on the balls of the feet, then rotate the ankles in an outward direction, letting the weight of the foot sink on to the outer edge of the foot from the toes to the heel. Then roll the foot in to normal position.

2. Stand with the feet as before. Roll the whole foot out until the weight is resting on the outside edge. Return to normal position.

3. Stand erect with the hands on the hips. Lift the left foot, keeping the leg taut, and swing forward taking one pace with the toe placed down first. Ride over, rising on the toes, swinging the weight to the front foot. Sink back on to the heels. Repeat this forward walk around the room, rising on the toes at each step and walking on an imaginary chalk line.

#### CONSIDER YOUR FEET

Have you ever stopped to think how much work the feet do every day? It has been estimated that, on an average, a woman takes at least 10,000 steps in a single day of her housework. In addition to this, the feet have to carry 300 times their own weight (sometimes more) each step of the journey.

The following exercises will strengthen both feet and ankles.

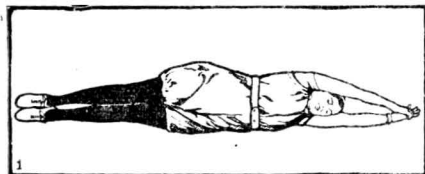
1. Stand erect. Rise on the toes as high as possible, keeping the feet parallel. Then slowly sink back to the first position.

2. Repeat as above, with the feet turned in, and placed wide apart. This is more difficult than the first.

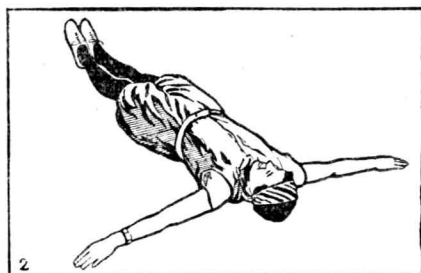
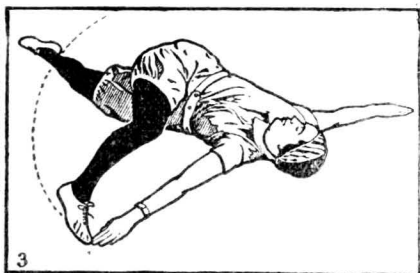
3. Sit on a chair, place one foot on the other knee, and grasp the foot with both hands. Rotate the foot, pushing it as far around as possible very slowly. Repeat with other foot.

4. Sit again, holding the feet in front. Now stretch the feet gradually downward as far as possible. Hold the position, then begin to stretch again in an upward direction.
5. Walk on tip-toes round the room.

## How to Reduce Weight

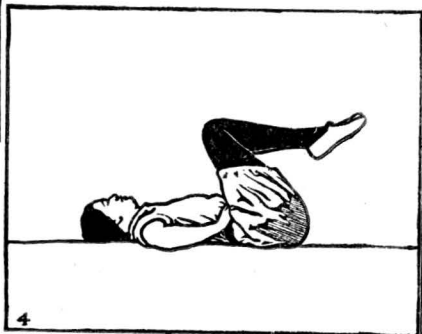


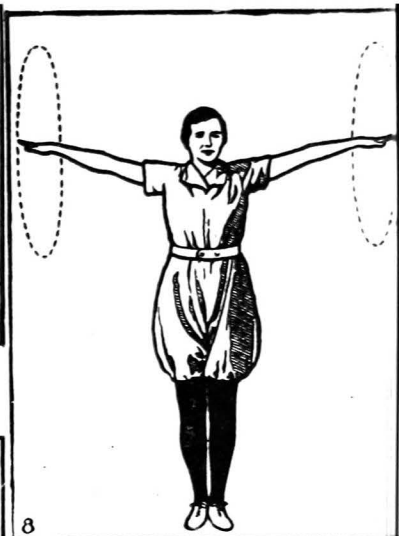
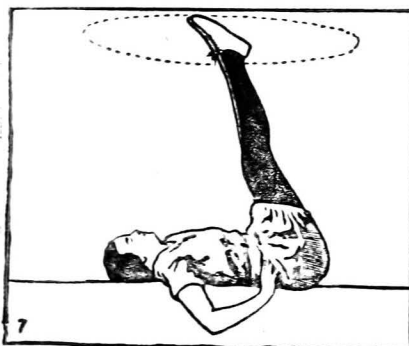
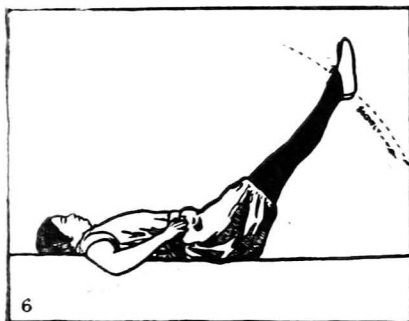
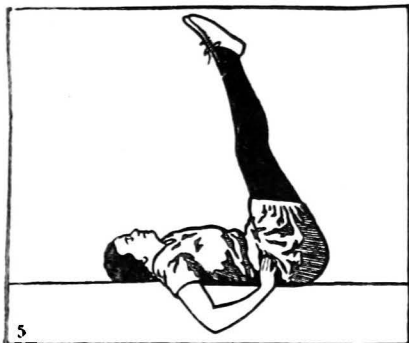
Exercise 1. Roll to reduce the entire body. Fig. 1. Clasp hands over head and keep the body stretched as tall as possible, and repeatedly roll across the floor for several feet and back again.



Exercise 2. For reducing hips and waist. Fig. 2. Lie on back with arms out at sides. Fig. 3. Try to touch right hand with left foot; alternate with left hand and right foot.

Exercise 3. Fig. 4. Lying on floor, bend both knees to chest. Fig. 5. Raise legs straight up. Fig. 6. Lower legs slowly.





Exercise 4. Fig. 7. With legs straight up, make large circle with feet.

Exercise 5. Fig. 8. Raise arms to shoulder height at sides, and describe circles with hands.



Exercise 6. Stand with feet apart, hands at back. On count 1 (Fig. 9) jump, bringing feet together, clapping hands overhead. Count 2 (Fig. 10), jump to the original position, clapping hands at back.

Exercise 7. Stretch arms overhead, bend strongly from left to right. Do not hollow the back, bend at the waist.



## PART TWO

# Water Treatments

### A SIMPLE AND EFFECTIVE HEALING AGENT

**W**ATER, as a simple and effective remedy for the treatment of disease, has a very ancient and successful history. In the form of hot and cold baths, pours, douches, and packs, it was well known to the fathers of history. The geologists are unearthing most elaborately equipped hydrotherapy institutions which must have been well patronized by the health seekers of former days.

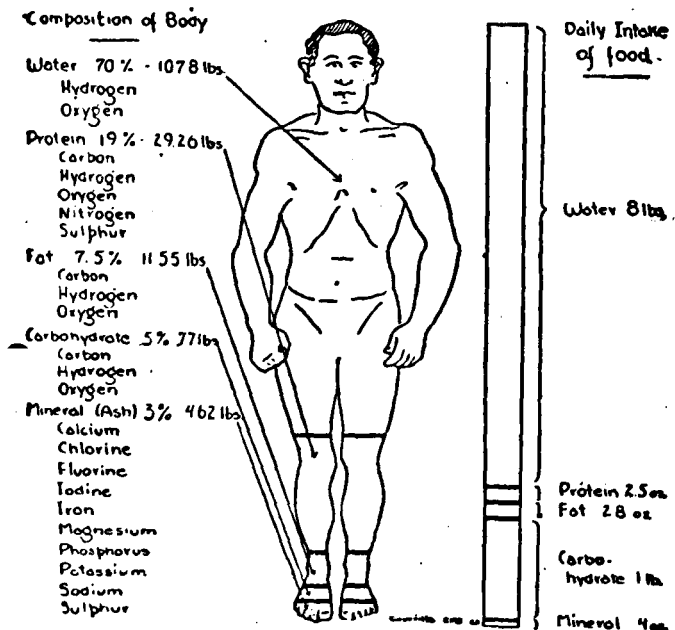
In modern times new ways and apparatus have been devised for using this ancient remedy, but many of the older and well tried measures are perhaps best suited for household use, owing to their simplicity and the few things that are required to make them effective. Such measures are here described.

When water at varying temperatures and in different forms is applied to the skin, either as a general bath or as a local application, there are set in operation within the body organism a series of reactions embracing blood circulation, nerve impulses, digestive secretions, oxidation, muscle contraction and relaxation. In fact, every vital process may be effectively influenced, stimulated, or retarded according to the nature of the water application employed.

A knowledge of how to administer a few simple treatments will often make it possible not only to relieve suffering but to prevent serious complications which arise from neglecting some apparently trivial ailments. Only those treatments that may be safely given in the home will be described.

A perfect circulation of pure blood is necessary to keep the organs and tissues of the body in a healthy condition, and the blood itself very soon becomes impure if its circulation is impeded. This may be illustrated by placing a tight band about the base of the finger. Notice how quickly the colour changes as the veins become filled with dark, impure blood.

Composition and Food Requirements  
of a 154 Pound Man.



There are many influences which affect the circulation of blood, very noticeable among which are heat and cold.

### SOME WATER FACTS ABOUT YOURSELF

The accompanying diagram will help to make more clear how largely we are dependent upon water for our very existence. Water is very much more important than food in our general structure. Much the same importance attaches to it as a remedial measure. We should learn to know more about water and how to use it as food and as medicine.

Of the 150 pounds constituting the weight of an average person, 107 pounds consist of water. Only 43 pounds of his weight consist of protein, fat, minerals, and other materials.

## The Fomentation

One who understands the art of properly applying a fomentation is in a position to relieve a vast amount of suffering. There is scarcely a pain from any cause which cannot be relieved, to some extent at least, by its intelligent use.

The only articles necessary for this treatment are two flannel cloths, a few quarts of boiling water, and a towel. The best fomentation cloths are made from half woollen blankets. A large blanket will make four excellent cloths. If these cannot be obtained, any heavy flannel of sufficient size (a yard square) may be used. Cotton cloths lose the heat so quickly that they are not practical. Thick towels may be used, however, if no woollen cloths are available.

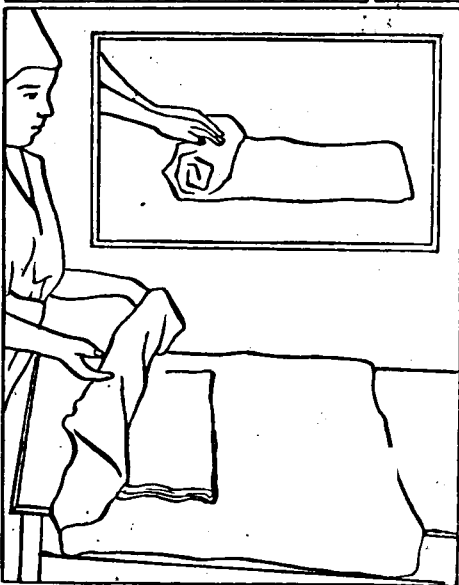
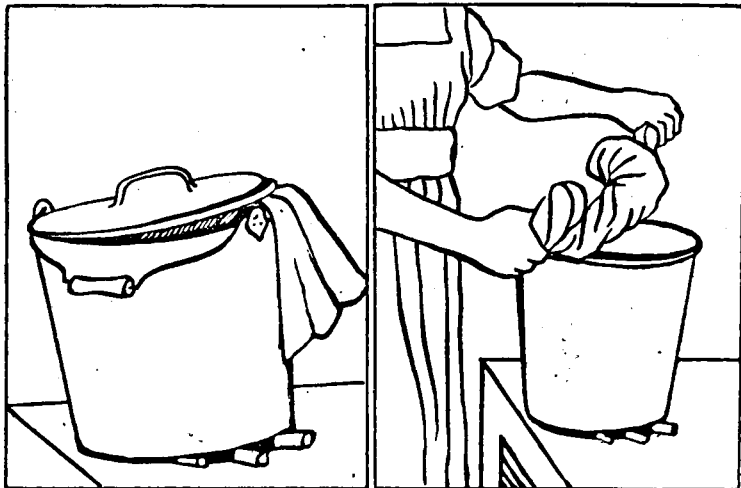
The clothing should be removed from the part to be treated, and the patient covered with a blanket. Double

one of the fomentation cloths and place it next to the body, over the seat of pain, half of it being left free to cover the wet cloth. Fold the other cloth three or four times, according to the area of the part to be treated. Usually the cloth is folded three times for the chest, abdomen, and back; four times for the spine, a limb, or the throat. Grasp the ends of the folded cloth and twist it several times, dip it into the boiling water, twist very tightly and lift out of the water. Continue the wringing by changing the ends from one hand to the other several times, then forcibly extending the cloth. If this be repeated several times, the cloth will be dry enough to prevent burning the patient; but it must be done quickly, or too much heat will be lost. It is well to have the boiling water on an oil stove or *angithi* near the patient; but if the cloth must be carried some distance, it should be protected by a towel to minimize the dissipation of heat. To adjust the cloth, drop one end and shake slightly; now grasp the loose end again and place the hot cloth over the dry one; fold the ends over, and cover with the free half of the dry cloth. In three to five minutes the wet cloth should be wrung again from boiling water and applied as before.

As a rule, the hot cloth is applied three times, making the treatment last from fifteen to twenty minutes; but it may be continued somewhat longer if necessary to accomplish the desired result.

To finish this treatment, sponge the part quickly with cold water, dry thoroughly, and oil well with vaseline or mustard oil.

If you have never experienced the benefit of this treatment, give it a trial. You will find that it greatly relieves pain in the stomach, liver, abdomen, and pelvis. It is also a splendid treatment for neuralgia and painful joints; but in these cases instead of using the cold sponge to finish the



*Above:* The folded fomentation cloth should be immersed for several minutes in boiling water. Let the two ends hang over the edge; this will make it easier when you come to wring the fomentation out preparatory to application.

*Left:* The lower picture shows the fomentation being wrapped in a dry piece of blanket. The upper shows the whole thing being rolled preparatory to taking it to the bedside.

treatment, leave the hot cloth until it gradually cools; dry thoroughly, and protect the part with a dry flannel.

Applied to the spine, fomentations have a very soothing effect on the entire nervous system. In cases of nervous headache the application should be to the back of the neck. If the pain is in the side of the head, apply the fomentation here.

In giving fomentations to the head it is best to use soft flannels of light weight. Try treating a cold on the chest or throat with fomentations, followed by the heating compress, which will be described later.

One important advantage of this method of treatment is that you are working in harmony with nature, actually benefiting the patient not only by relieving pain, but by establishing a better circulation; the poisoned blood is drawn from the congested part of the body and the way prepared for purer, life-giving blood to renew the diseased tissues.

## Foot Bath

**PLUNGE** the hand into warm water for a few minutes, and watch the results. The blood vessels are dilated by the heat, and the hand becomes red. There is more blood in the hand than before, and correspondingly less in the rest of the body. This shows that blood may be drawn from one part of the body to another by application of moist heat. Suppose there be congestion in some organ of the body; by applying heat to another part, we can draw a portion of the blood from the congested organ, and thus relieve the pressure and consequent pain caused by the stasis of impure blood. A very simple treatment based upon this principle is the *foot bath*.

The articles necessary for giving this treatment are: A large, deep basin or a regular foot tub, a towel, a blanket, and plenty of hot and cold water.

Have the patient sit in a chair well protected from any draught, and proceed as follows: Place the feet in a bath of warm water, the temperature of which should be gradually raised (by adding hot water) as the patient can bear it. Avoid burning the patient by placing your own hand between the feet and hot water you are adding, mixing the water well with that of bath before it strikes the patient's feet. The blanket is thrown over the patient so that the feet are protected, as well as the rest of the body. The feet should remain in the hot water ten or fifteen minutes, then be lifted out, quickly dashed or sponged with cold water, thoroughly dried, and covered at once. If the bath be given to induce sleep, it should be somewhat prolonged, and the temperature should not be raised to such a high degree that any excitant effect is produced, but should be soothing throughout.

When giving this treatment to a patient in bed, let him lie on his back, with knees well flexed. The feet are then placed in a basin or foot tub of warm water. The bedding may be protected by a mackintosh or several thicknesses of paper placed under the tub. Another mackintosh or large paper should be placed over the tub to protect the blanket which covers the patient. The remainder of the procedure is the same as described before.

A throbbing headache may be greatly relieved by placing the feet in hot water, and at the same time applying a cold, damp cloth to the head. The cold contracts the blood vessels in the head, while the water dilates those of the feet, thus relieving the pain caused by the congestion of blood in the head. In the same way a cold may be aborted. In the first stages of a cold the mucous membranes of the nose are highly congested. If a circulation of pure blood through them can be established before the tissues are diseased, the cold may be avoided. There is no better way of doing this than by taking a foot bath.

Every mother should know that croup may be greatly relieved by dilating the blood vessels of the feet. If the lungs are congested, making it difficult for a little child to breathe, relief may often be obtained by placing the feet in warm water until they are quite red, then oiling them and placing a hot water bottle or warm stone near them to ensure their retaining as much blood as possible.

Pain in the pelvis may often be relieved by the hot foot bath. It is also a very restful treatment to one who has been confined to bed for some time.

If the feet are cold, some of the blood which should be circulating through them is probably congesting some other organ of the body. It is important, then, that the feet be kept warm. It is almost impossible to sleep when the feet are cold, because in such a condition the head is usually congested. A sleepless night may often be avoided by taking a warm foot bath before retiring.

## The Heating Compress

IN ORDER that the normal temperature of the body may be retained, heat must constantly be eliminated by the pores of the skin; but by applying some non-conductor of heat to a certain part of the body, the heat naturally thrown off by that part may be conserved and used in giving a very simple but effectual treatment.

I have already described the benefits derived from local applications of heat. The heating compress, while it does not give the immediate relief to pain which follows the fomentation, may be used for a longer period of time. By it the salutary effects of the fomentation may be prolonged, the cell activity which is all important in the restoration of diseased tissue greatly encouraged, while the affected part is, at the same time, protected from chilling.





A heating compress for sore throat.

*Method of application:* The simplest heating compress is a dry flannel placed snugly about some part of the body. If mustard or some other oil be first applied, more heat may be retained. The effect of the treatment may be further increased by adding to the oil a few drops of some irritant such as turpentine, spirits of menthol, spirits of camphor, or eucalyptus. The irritation thus produced brings more blood, hence more heat and moisture, to the part being treated. The flannel protector retains that heat, which assists in the restoration of the diseased tissue.

However, the most marked results are obtained by the following procedure: Take a piece of *pagri* cloth, or some similar cotton material of sufficient size so that when folded in the desired shape there will be three or four thicknesses.

For the throat the folded cloth should be four or five inches in width and long enough to wrap around the throat and lap well. For the chest the cloth should be doubled and folded diagonally, wrapped about the shoulders, and folded across the chest in front. It should be large enough to wrap well both the back and front of the chest. The abdominal compress should consist of four thicknesses extending from the sternum to the hips and passing entirely around the body. When a joint is to be treated, the compress should encircle it and extend a few inches beyond. When the cotton cloth is folded in the desired shape, wring it well from a small amount of very cold water, to which a few drops of camphor may be added. Shake lightly, and quickly apply to the part to be treated. Have ready two thicknesses of some heavy woollen material so that it will completely cover the cotton compress. Just as soon as the cold compress is applied, cover with the dry woollen one, and secure it with safety pins. Be sure that there are no openings; if there are, air will enter and come in contact with the damp cloth.

The cold application first contracts the blood vessels, but this contraction is quickly followed by a greater dilation than was at first present. Its action has been aptly likened to that of a pendulum when drawn to one side and released. It swings far beyond its original position.

Greater activity in all the cells is thus stimulated and a very comfortable feeling of warmth follows. Now if the woollen protector be quickly and properly applied, this pleasant feeling will continue and the heating process will follow. Do not make the mistake of thinking that some heavy cotton material will serve the purpose as well as the woollen. Cotton is a conductor of heat and will not only prove unsatisfactory, but harmful, if used over a damp cloth.

The compress should usually be worn at night. When removed the part should be rubbed briskly with cool water,

dried carefully, and protected with suitable clothing. The compress may be renewed and worn during the day.

*Indication for use:* A slight irritation in the throat resulting from cold is an indication for the use of dry flannel. A severe sore throat may often be avoided by this simple means. Slight coughs and colds in small children are much benefited by rubbing the throat and chest with oil to which one of the irritants mentioned before has been added, and then protected with a dry flannel. Children will not resist this treatment as they often do applications of heat and cold. In more severe cases, such as croup, bronchitis, whooping cough, and tonsillitis, fomentations followed by the heating compress are indicated. The abdominal compress is very helpful in cases of digestive and intestinal disorders. In strains and sprains the heating compress following a thorough application of heat is a very valuable treatment.

## Blanket Packs

THERE are many kinds of packs which are found to be more or less useful as home treatments. In describing these, a few conditions will be mentioned where they may be used quite safely by those who have not been especially trained in the care of the sick.

*The dry blanket pack:* In combating a chill, this simple treatment will be found very useful. A chill is an effort of nature to increase the amount of heat in the body. The conservation of the heat constantly being eliminated from the body, reinforced by external application, will relieve the heat-producing organs, and at the same time add much to the comfort of the patient.

The dry pack should be given just before, or during the chill, and is given as follows: Spread several blankets on a bed or couch. Quilts may be used in place of some

of the blankets, but a blanket must always be uppermost. The patient should drink a glass or two of warm water, remove his clothing, and lie down on the blankets. If preferred, a light undersuit or night dress may be worn during the treatment; but this should be replaced by dry clothing when the treatment is finished.

**D** Bring one side of the blanket over the patient, and tuck in well on the opposite side. Then do the same with the other half of the blanket. Hot water bottles which have been previously made ready, should now be placed at the feet, sides, and back of the patient. If these are not at hand, hot bricks, stones, or sand bags may be used. Fold the remaining blankets over the patient, and tuck them in snugly, especially about the neck and feet. When the chilling ceases, remove the hot bags, and throw off some of the blankets, as they interfere with the elimination of heat and may tend to raise the temperature of the patient if prolonged for any length of time.

This pack may also be used to induce perspiration, and should then be continued for an hour or more, the head being kept cool, and the patient given water to drink every fifteen or twenty minutes.

The hot blanket pack is, however, preferable for this purpose. It differs from the dry pack in that the blanket which lies next to the patient is wrung from hot water, temperature about 160°. Two persons will be required to do the wringing. Grasping it by the ends, twist the blanket a few times, and dip it into the hot water. While in the hot water, it should be twisted tightly, then lifted out and forcibly extended. It should be wrung as quickly and as dry as possible, then placed upon the other blankets which have been previously arranged on the bed; as soon as the hot blanket is in place the patient should lie down in the centre of it, and extend the arms over his head. Now draw one side of the blanket over the patient and wrap it in about

the leg on that side; place the arms by the sides and bring the other half of the blanket across them; wrap it round the other leg, and tuck in well. Cover the patient with the first dry blanket, put hot water bags in place, then bring the remaining blankets over and tuck in snugly.

To remove the patient from the pack, first take out the hot bags; then bare one arm and sponge it quickly with hot or tepid water, dry, and cover it with the dry blanket. Treat the other arm and the chest in the same way, pushing the wet blanket under the back. Sponge and dry the legs, uncovering one at a time, and, as the patient turns on one side, remove the wet blanket. After the back has been sponged and dried, put on dry clothing and then allow the patient to rest for a short time.

This treatment when continued until perspiration is induced is an excellent substitute for the vapour bath where the latter is not practical, and will be found especially helpful in the first stages of infectious fevers and influenza. It also gives great relief in Bright's disease.

In cases of collapse and subnormal temperature, it will be found useful; but in these cases it should not be prolonged after the required heat has been imparted to the body.

In typhoid and other fevers, where the surface of the body is cold and the internal temperature high, the hot blanket pack has been found beneficial. All hot bags, except the one at the feet, should be omitted, and the treatment should last only from three to five minutes. The application of heat to the surface of the body brings blood from the congested internal organs to the skin where it can be cooled. At the same time, the feeling of warmth will cause less heat production within the body.

*The leg pack:* In cases of pneumonia and congestion of the lungs, the hot leg pack gives great relief by dilating

the blood vessels of the legs and feet, thus relieving, to some extent at least, the congestion of the lungs. One advantage of the leg pack over the foot bath described previously, is that it can be quietly given with less exertion on the part of the patient, and should therefore be used when the patient is too weak to take the foot bath.

Place a dry folded blanket under the hips and legs of the patient. Wring a small single blanket out of hot water and place it over the blanket. Wrap each leg and foot in the wet blanket and protect with the dry. A hot bag should be placed at the feet, and the patient allowed to lie quiet from twenty minutes to half an hour. Hot bags placed at the sides of the legs will increase the effect of the treatment unless the patient's temperature is too high to warrant the application of so much heat.

In typhoid fever, this is a splendid treatment to accompany the cool sponge bath when the legs are cold. When the upper part of the body has been sponged, the pack should be removed and the limbs sponged with cold water.

Bed-ridden patients, who suffer from cold feet and restlessness, will find the leg pack a very soothing treatment.

## Wet Sheet Packs

IN FEVERS, when the skin is dry and hot, the wet sheet pack is a safe and reliable means of reducing the temperature. It is especially useful in typhoid, and seldom fails to reduce the temperature and quiet the restlessness which so often accompanies a high fever.

Antipyretics may be dangerous, as they almost invariably reduce the temperature by lowering the vitality. The wet sheet pack abstracts heat from the body, but does not depress any of its organs. In fact, it acts more as a tonic,

and is, therefore, immeasurably superior to drugs as a rational treatment. It should never be used, however, when the skin is cold and clammy.

When the simpler treatments, such as the sponge bath, cold compress, and ice bags, suffice to keep the temperature below the danger point, the wet sheet pack need not be given; but when the temperature persists in staying above  $103^{\circ}$  in spite of these treatments, the wet sheet pack should be given as follows:

Turn the patient on one side, roll one half of the blanket together and lay it close to his back. Smooth the other half of the blanket over the bed, and then turn the patient on his other side. The rolled half of the blanket should then be drawn out and smoothed over the bed. Now remove any clothing and protect him with the blanket; wring a sheet out of water, the temperature of which should be about  $65^{\circ}$  or  $70^{\circ}$ F. Turn the patient on his side again, shake out half the wet sheet, leaving the other half gathered in as small a space as possible, and place it close to his back; then turn the patient enough to draw out the gathered half of the sheet. Now have him lie on his back with his arms extended over his head. Quickly bring one half of the sheet across them, and wrap about the other leg. Give rapid but light friction over the sheet, and when it begins to feel slightly warm, draw the blanket over it. How long the patient should be left in the pack depends upon the rapidity with which the sheet is warmed. When the sheet becomes as warm as the body, or nearly so, it should be again wrung from cold water, and applied to the body the same way as before. This treatment should be repeated if possible until the temperature has been reduced as low as  $101^{\circ}$ . At first the sheet will have to be changed every few minutes.

The patient will often rest for some time after this treatment, and the temperature usually rises less rapidly than it does after other treatments.

*The wet sheet in insomnia:* Sedative drugs are always depressing and should be avoided as far as possible. In many cases the neutral wet sheet pack has been found an effectual, as well as harmless, substitute. Insomnia caused by nervous excitement will often yield to the soothing effects of this pack. It is also helpful in quieting and controlling some cases of insanity. It is given as follows:

Spread one or two blankets on a bed, and over these a sheet wrung as dry as possible from water having a temperature of about 70°F. The wet sheet should come about two inches below the upper edge of the blankets, and the blankets should cover about half of the pillow. Remove patient's clothing, let him lie down on the wet sheet, and extend his arms over his head. Wrap him in the wet sheet in the same way as described before. His arms may be left out of the sheet if he desires. The blankets should be brought over the patient and tucked in snugly. Do not leave any of the wet sheet exposed, and be sure that the surface of the body is everywhere in contact with the sheet. Place a warm bag to the feet. The amount of covering required depends upon the temperature of the room and the condition of the patient; only just enough covering to keep the patient comfortable should be used. The patient may be left in this pack as long as it is restful to him.

As an eliminative treatment, the wet sheet pack is less depressing than the hot blanket pack, and should be used when the patient is strong enough to react from the effect of the cold. The blanket and wet sheet should be placed in the same way as in the neutral pack just described; but more blankets will be required. Heat should be placed to the feet and to the sides of the legs if necessary. The sheet should be wrung from water at 60°F.

This treatment should be preceded by a thorough cleansing of the bowels. The patient should take a good drink of water, preferably warm. Continue the pack until perspi-



ration is induced. To remove the patient from the pack, first expose one arm, sponge it with cool water, dry and cover with the blanket, pushing the wet sheet under the patient as far as possible. Treat the other arm, the chest, and the legs in the same way. Now have the patient turn on one side and withdraw the sheet. Sponge and dry the back, put on the clothing, and let the patient rest for a time.

*The hot and cold trunk pack:* The wet pack applied to the trunk only is used as an aid to the digestive organs. Fold a blanket once and lay it across a bed; over this place half a sheet wrung from as cold water as can be obtained. The sheet must be narrow enough to come at least two inches within the upper and lower borders of the blanket. Have the patient lie down so that the upper border of the blanket comes just below the arm pits. Wrap both ends of the sheet about the trunk of the patient and protect snugly with the blanket. Place a hot water bag on the abdomen above the first layer of the blanket. Cover the patient with just enough blanket to make him comfortable; and let him remain in the pack from twenty minutes to half an hour; then remove the sheet, sponge the part treated, and dry it thoroughly. This treatment is a good tonic for the digestive organs.

## The Sitz Bath

THE sitz bath is a valuable treatment on account of its beneficial effects upon the abdomen and pelvis. It is possible for a large proportion of the blood of the entire body to be contained in the blood vessels of these viscera, and when for any reason its free circulation is disturbed, it immediately becomes a source of danger. We find these organs subject to chronic congestions which, if neglected, are apt to result in something more serious. Neuralgia of the pelvic organs is also a common affection.

The blood supply and nerves of these organs can easily be affected by external applications, as the same nerve trunks which supply them also send branches to the skin over the lower abdomen, hips, and thighs. The sitz bath has been found a most excellent method of stimulating the circulation of the blood and relieving pain and irritation in these organs.

A special tub for giving the sitz bath is generally used in hydropathic institutions, where this bath is given to advantage in many conditions in which its use would hardly



The sitz bath.

be safe in the hands of the inexperienced. In the home, a medium-sized, galvanised iron tub, such as is found in most of the homes of India, may be used. A smaller tub will be required for the foot bath, which should always accompany the sitz.

The method of giving the bath is as follows: Place in the tub enough water of the desired temperature to well cover the hips. The foot tub should be about half full of water at a temperature of  $105^{\circ}$  to  $110^{\circ}$ , and so placed that the patient can have his feet in it while sitting comfortably in

the larger tub. A towel should be folded across the edge of the tubs so that no uncomfortable pressure will disturb the circulation of the blood in the legs. Protect the patient with a sheet or a blanket if the room is cold.

The temperature of the bath and its duration depend upon the effect desired; but the foot bath should always be warm.

The cold sitz is given for its tonic effects. The temperature of the bath should be  $55^{\circ}$  to  $65^{\circ}$ , and it should be continued from one to three minutes. Vigorous friction should be given during the bath and drying process so that a good reaction will be secured.

The cold sitz is beneficial in chronic congestions. The water should have a temperature of  $65^{\circ}$  to  $75^{\circ}$ , and the bath should usually be continued from 15 to 20 minutes. Friction is employed throughout this treatment.

The neutral sitz bath, temperature  $92^{\circ}$  to  $97^{\circ}$ , continued from 15 minutes to half an hour, is valuable for its sedative influence upon the viscera of the pelvis and lower abdomen. It would be found helpful if given two or three times a week, or even daily, during the last months of pregnancy.

The hot sitz may, if more convenient, be given in one large tub, as the temperature of the foot bath is the same as that of the sitz,  $105^{\circ}$  to  $110^{\circ}$ F. Cold compresses should be applied around the head and throat, and then the temperature of the bath quickly raised from  $105^{\circ}$  to  $115^{\circ}$ . The duration of this bath should be from three to ten minutes. In taking the patient out of the hot sitz bath it is well to quickly pour over the whole body some water at a temperature of  $80^{\circ}$  or  $90^{\circ}$ . The patient should then be dried thoroughly, using friction. Another method of securing a tonic reaction and fixing the blood in the skin is to have the patient stand in the warm water while a pailful of cold water is dashed over the hips.

The hot sitz bath will be found a most excellent means of relieving the pain of inflamed hæmorrhoids, sciatica, and neuralgia of the pelvic organs. It can also be used as a substitute for a full hot bath.

## The Vapour Bath

THE accumulation of poisons in the system is a very potent cause of disease. Our bodies are provided with four avenues through which waste materials are eliminated. These are the lungs, the pores of the skin, the liver, and the kidneys.

In the rational treatment of disease we do all in our power to relieve and assist the organs. Fevers are usually the result of nature's effort to throw off poisonous materials which have either been taken into the body or produced there in such abundance that the natural means of elimination are inadequate. Too often it occurs that by our injudicious living the eliminative organs are overtaxed to such an extent that they become exhausted and unable to perform their functions properly. Colds affect these organs, and the general aching which so often accompanies a cold is due to the poisons retained in the system. Acids, improperly eliminated, cause rheumatic pains.

Profuse perspiration is a most valuable means of cleansing the system of many of the injurious materials which cause aches, pains, and fevers. The evaporation which accompanies perspiration is also an important factor in the reduction of abnormal temperatures. A very practical and convenient method of inducing this desired condition is the vapour bath.

In the home this bath may be given as follows: First, be sure that the bowels have moved freely. It is always well to precede the regular treatment with an enema. By this

means the bowels are not only cleansed, but the introduction of a quantity of water into the system is a great inducement to the production of perspiration. Have the patient take a warm drink, preferably hot water, hot lemonade, or sage tea. Place a cane-bottom chair over a basin of boiling water. The water must be kept boiling by placing it on a few live coals placed in a small fire-pan. Put a cushion or large folded towel on the chair to prevent the steam from burning the patient. Remove the patient's clothing, wrap him in a



The vapour bath.

sheet, and have him sit down on the chair. Place his feet in a tub of hot water, and completely envelop the foot-tub, chair and the patient, except the head, with the blankets. Draw the blankets well around the neck and secure with safety pins. There must be at least two thicknesses of blanket. Be sure that no opening is left where cold air may enter or steam escape.

Keep a cloth frequently wrung from cold water on the patient's head, and let him drink all the water he will. From time to time carefully add hot water to the foot bath so that it will be kept as warm as the patient can bear it. Perspi-

ration may be hastened by placing hot water bottles at the back and on the stomach.

Fifteen to twenty minutes is usually long enough to bring about a profuse perspiration. This can best be observed on the face, as the condensation of steam on the body may be mistaken for perspiration. Soon after moisture appears on the face, preparations should be made for taking the patient out of the bath. First remove the fire and the boiling water. Next take the feet out of the foot bath, dry thoroughly and protect with sox or a pair of slippers. Then remove the blankets and wet sheet, wrap the patient in a dry blanket and have him lie down well protected until he is rested and gradually cooled. A sponge bath may then be given. The patient should rest in bed for some time after taking this treatment. Be sure that no draught strikes the patient at any time, either during the treatment or while he is on his way to lie down.

The vapour bath is an excellent treatment for colds, rheumatism, beginning fevers, and many other disorders due to defective elimination. It should not be given to very weak patients.

## The Salt Rub

THE salt rub is a most refreshing tonic treatment. While it is seldom useful in acute diseases, or in cases where there is much irritation of the skin, it is very valuable in many cases to stimulate a reaction where the skin is inactive and does not readily respond to the cold friction.

The method of giving the salt rub in the home is as follows: The appliances required are a small tub to stand in, a large wash basin of cold or tepid water, and about a pound of salt, together with a good bath towel. The room in which the treatment is given should be comfortably warm.

Let the patient strip and stand in the little tub, which may be partially filled with water as hot as can be borne. The nurse, or whoever gives the treatment, should take a handful of the salt, moisten slightly with water, and briskly rub one of the arms, then quickly wash off the salt with water, and dry. Proceed to do the same with the other arm, the chest and back, and the rest of the body, ending with the feet. Every part should be thoroughly rubbed with salt moistened with water, then rinsed with the hands dipped in water, and finally dried.

Another, and, in most cases, equally good way, is to rub the whole body at once with the salt, then rinse off in tepid water, and dry altogether. In either case, the patient will have a marked sense of warmth and well-being, and the skin will be delightfully smooth. Cold-blooded persons, and all whose vitality is low, experience great benefit from this simple measure.

Many prefer to follow a salt rub with an oil rub, using the fine vaseline or a little olive oil. In this case, after thoroughly rubbing in the oil, be careful to remove any excess with a towel.

Any person desiring to do so can give this treatment to himself, though it is a little awkward to reach and fully treat the shoulder blades. It may be taken to excellent advantage in connection with warm water or hot full bath as follows: After lying in the warm water for a little while arise and, standing in the bath, apply the salt according to instructions, moistening it with warm water. If the salt is rather fine, moisten it very slightly, and this will increase its effect upon the skin. After rubbing the salt over the body, lie down again in the bath, and turn on the cold water. Then after lying for a few minutes in cool water, apply the towel vigorously.

The salt rub is especially an effective means of drawing the blood from the internal organs, and setting up a vigorous

circulation in the skin. Congestion of the head, lungs, and other organs is thus relieved, and cold feet and hands made warm.

In giving this treatment, care should be taken not to use such coarse salt or to apply it so severely as to injure the skin. Let the movements be brisk, however, and take care not to let the patient get chilled.

## The Cold Bath a Tonic

A COLD application to the skin is one of the best general physiological tonics. The cold first causes the blood vessels to contract; this is followed by a vigorous reaction, and the skin becomes red due to an exhilarated blood circulation. This increased circulation is not limited to the skin only, but is shared by every organ and structure. An increased active circulation means increased nutrition, increased resistive power against disease and disease germs, as illustrated by the following experience:

Surgeon McGregor, formerly medical director of the English army in Egypt, made a very interesting observation concerning the value of the cold full bath. While he was in charge of the "Blues," a famous old regiment then located at Canterbury, an epidemic of typhus fever generally complicated with pneumonia broke out. The disease developed so rapidly that in a short time one fifth of his regiment were on the sick list, and there were thirty-three cases of fever, with daily accessions to the number. At this juncture it occurred to Dr. McGregor, a disciple of Currie, who was familiar with the use of the bath in the treatment of cases of fever, that the cold bath might be used for prophylactic as well as curative purposes. Accordingly, to quote his own words, "About the 12th, at my earnest recommendation, all the regiment out of the hospital were marched three times



a day to the river side, and every man was made to bathe. The good effects of this were speedily manifest, and the number of new fever cases decreased daily, and those that did appear wore a milder aspect. Many, indeed, yielded to the common treatment; in some cases an emetic, and in others the cold bath, at once cut short the disease. We lost no cases in October. Indeed, it was evident to all that after the general bathing of the regiment, the contagion was stopped; the few cases that occurred after this were stripped of all the alarming and dangerous symptoms with which the disease broke out. In all, there were sixty cases of fever, occurring from July to October 21st, on which day the last case appeared. We lost six of this number."

The immunity evidently conferred by the tri-daily bath was certainly more than a coincidence. It would seem eminently reasonable to suppose that if the cold bath aids recovery by stimulating the vital forces and increasing the vital resistance and to such a degree that the patient already thoroughly infected with the disease is brought to a safe recovery, the application of the same measures before the contraction of the disease ought so to fortify the system as to enable it successfully to withstand the influence of the infectious element to which the malady owes its origin. The principles involved in this suggestion are worthy of thoughtful consideration. If the principle holds in relation to a single malady, it is equally sound in relation to all others which depend upon either infection or any other external cause; excepting accidents.

## Friction Baths

TIME was when fresh air and water, two of the most necessary remedial agents, were excluded as far as possible from the sick room; even now, there are many who

consider it dangerous to bathe the body with water during an illness.

While it is true that baths, carelessly given, may prove injurious to a patient, there are but few cases where their use will not prove beneficial if properly administered.

When we think of the many millions of eliminative glands located in the skin, and understand the importance of their work which, far from being lessened, is increased by the presence of disease, we must conclude that it is not only reasonable but imperative that they are at least given a chance to do their best. If the poisons eliminated by them are allowed to remain on the surface of the body, these glands will in time become so clogged that they will be unable to do their part in the elimination of poisons from the body.

Water bathing is the safest and most satisfactory method of removing these excretions, and it stimulates all the important functions of the skin at the same time. The following are some of the baths which may be given safely and with good results to bed-ridden patients:

*The Soap Wash:* The soap wash should be given at least once a week, and in most infectious diseases, especially during the scaling stage of eruptive diseases, it should be daily employed. Even in pneumonia, bronchitis, and similar diseases, the soap wash may be given; but every precaution must be taken to avoid chilling the patient. The temperature of the room should be at least 65°F., and no draught should be allowed to strike the patient at any time.

The articles required for this treatment are a basin of warm water, a basin of cool water, two small towels, and a cake of some good toilet soap, or, in infectious diseases, a disinfectant soap.

Remove the patient's clothing and cover him well. First, wash and dry the face and neck. Then bare one arm, and slip one of the large towels under it to protect the bedding. Wring one of the small thin towels from the warm water, apply the soap, and with short, quick strokes sponge the arm. Then wring the towel from the warm water again and repeat the sponging without the soap. Now wring the other small towel from the cool water, and briskly sponge the arm with it. Wrap the dry towel about the arm as soon as sponging is completed and dry with friction applied over the towel. Then remove the towel, rub the arm with the hand to be sure that it is thoroughly dry, and cover at once. Treat the other arm in the same way. Leaving both arms well covered, expose the chest and abdomen; protect the bedding with the towels, and proceed with the bath in the manner described for the arm. One leg at a time should then be flexed and a large towel slipped under it to protect the bedding, and be in place for drying the leg after the wash has been given. The patient should then be turned on his face as nearly as possible, and the back washed.

Care must be taken to have the patient's feet warm before beginning the treatment. It is always a good practice to place a warm bag to the feet during the treatment.

Every movement must be brisk, and the entire bath should not take longer than fifteen or twenty minutes. Only a small part of the body should be exposed at one time and no part should be left exposed longer than is absolutely necessary.

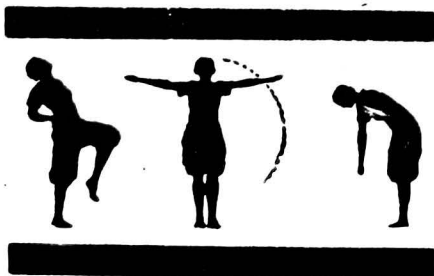
After the bath, the patient should be clothed, covered well, and allowed to rest, and to enjoy the refreshing effects of the bath.

*The Cold Sponge:* The cold, cool, tepid, and hot sponge baths are given in the same way. The cold sponge

is given with water from 40° to 60°F. A mitt of coarse cloth is more effective than a towel for giving this bath, as the friction caused by the cloth aids in bringing about a good reaction. The rubbing should be brisk and vigorous enough to cause a redness in the skin. The cold friction bath is often used in fevers, but should never be given if the patient is very weak or the skin cold and blue. In these cases the short hot sponge is better treatment. It is given in the same way with water at a temperature of from 130° to 140°F.

The cold friction bath is a splendid tonic treatment. If the patient is feeble and nervous, and objects to the cold applications, the wet hand rub may be substituted for the cold sponge bath, and good results obtained. The hands of the attendant should be dipped in the cold water and then rubbed briskly over the patient.

The tepid sponge with water at 85° to 95°F. will be found very helpful in mild febrile cases, and very soothing to nervous patients. Witch Hazel added to the water increases the soothing effect of this bath. A small amount of water should be used. No sponge or towel is needed, as the water is applied with the hands only.



## PART THREE

# Diet

## Health-Promoting Diet

**F**OOD, and the diet developed therefrom, has always been an important part of woman's contribution to the general scheme of life. It is, therefore, quite as it should be that we hear the call coming from the All-India Woman's Conference, in a resolution, urging the women of India to "take an intelligent interest in the problem of dietetics so as to enable them to prepare balanced diets for the family with the help of popular literature and expert opinion." This is certainly a splendid move in the right direction.

The heart of the problem is in the villages rather than in the cities. As in the past so it is still true that by far the greater population of India is a village population. The nutritional problem as it concerns India is essentially a village problem. The remedy of India's nutritional deficiencies must be applied, and made applicable to village life, if its results are to be really effective.

At the village threshold, however, we meet our real economic difficulty, and become immediately aware that any adjustment or balancing of the diet must be kept within the meagre family purse. This is really a giant task.

*The Problem.* If nature had arranged for our nutritional needs so that any one of such staple foods as wheat,

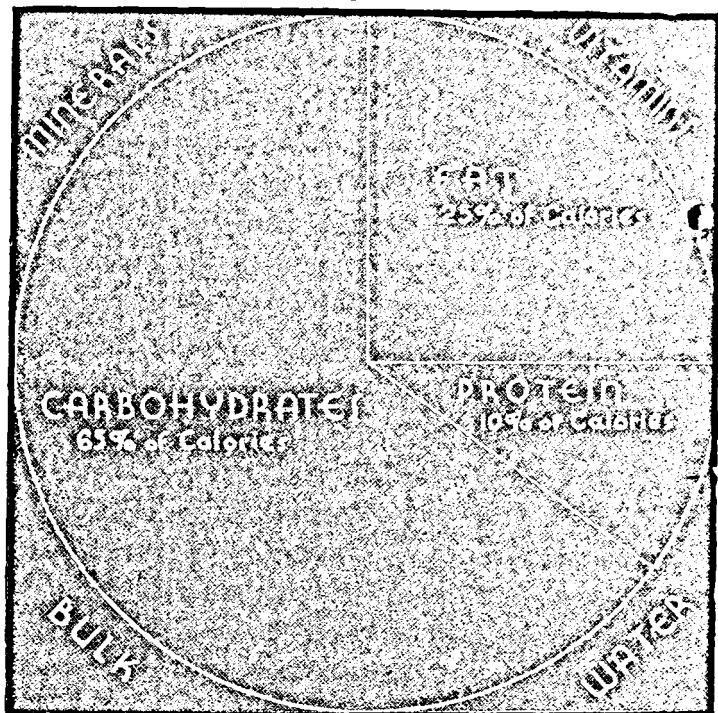
rice, *dal*, vegetables, fruit, meat, fish, fowl, would in itself supply the materials required for body construction, repair, protection, and defence, then there would be no problem at all, as deficiency diet would cease to exist. Or, if even any two of such foods provided for our needs, the matter of diet need not become the medical, economic, or social problem which it now represents.

Men differ outwardly as to complexion, expression, stature, and temperament. They differ politically, religiously, intellectually, and morally, but their nutritional requirements are the same with certain slight variations due to environment and heredity. Generally and essentially man's food requirements are the same the world over.

Through necessity, custom, and religion, certain differences in practice and food selection have come about; to these variations the body organism has developed a considerable capacity for compensation and adaptation. These adaptations to food restrictions and conventions are similar to those to which belligerent nations in war-time have to learn to adjust themselves when deprived of normal sources of food supply.

Taking man as he is under the skin, forgetting his exterior and his mental aberrations, looking at him as he then would appear,—a living functioning machine,—we soon discover that he has certain common requirements for materials in the rough. These are starch, sugar, fat, and protein, which contain sixteen amino-acids, twenty minerals, and about eight or more vitamins. In addition there is required a certain, indefinable, vital something obtained only from fresh uncooked foods.

These essential nutritional elements have been so distributed in nature among different kinds of food stuffs, that it requires a certain variety or mixture of food materials in order to obtain and to maintain a balanced and satisfactory



The seven essentials of an adequate diet are shown in this chart. Substances represented in the circle are fuel foods. Those in the corners of the square are regulators and cleansers.

healthful nutrition. Only when the full nutritional needs are fulfilled by the daily diet, can one be equal to meeting any natural physical requirement of work, play, or emergency. This matter of satisfactory nutrition also influences mental capacity and efficiency.

Certain nutritional essentials and their relation to health and disease have now been so unquestionably established that we can unfold the interesting story from the testimony

of those whose word carries conviction and authority. We give the opening word on this subject to Lord Horder:

“Take this business of nutrition that we hear so much about. Science is slowly discovering why it is that a mixed diet, containing food that has not been too much tampered with in its preparation, makes for health, and why a diet that is not sufficiently mixed, or does not contain enough fresh food, makes for ill-health. It is because foods that are ‘body builders,’ ‘body protectors,’ ‘body workers,’ and ‘body warmers,’ are all represented in the mixed diet, and some of them are absent, or are only present in too small a degree, in the ‘deficiency diets.’ In other words, those of our ancestors who were healthy ate what is now called a ‘balanced’ diet without knowing it.”

“But, as I say, this new knowledge is of great value in helping us to say if any section of this community is being inadequately nourished and why, and it gives us equally valuable help as to how best to remedy the defect. Certain important principles emerge. One is that the simpler and more restricted the food, the less must we interfere with its nutritive value, whether in its manufacture or in its cooking; in this case bread must be made from the whole of the meal, potato must be the whole potato, and the rice must be the whole of the rice. If, on the other hand, the articles of food are widely assorted, deficiencies in one or two are easily made good in the others. You can ‘balance’ your diet in either case, but it is clearly the poor man’s table that needs the investigations of science, and not the table of the well-to-do.”—*Health and a Day*,” pp. 105, 106.

Furnas, in his book, “Man, Bread and Destiny,” has well stated the relation of food to heredity: “As far as any experimental evidence goes, the normal characteristics of an animal are dictated by heredity: Food partaken during life is an important item of the environment which determines



whether these specifications may be filled or not. A certain man may be genetically equipped to reach an adult height of five feet eight inches. All the food in the world will not make him grow five feet ten inches, nor can he, by taking thought, 'add one cubit to his stature.' However,—and here is where a great deal of confusion originates,—if the youth's food is deficient in quality or quantity, he may never come up to his normal, foreordained achievement of five feet eight inches. He may only grow to five feet six inches."

What is here stated regarding stature is equally true of other physical functions and mental development, also of susceptibility to disease. Food is the factor which, after heredity, or in spite of it, determines how and what we are to be, and perhaps of what we will die and what age we may attain.

The almost mathematical relation between defective food and diseases of various kinds as observed in India has been made abundantly clear by the splendid research work at the Government of India Nutritional Research Laboratories, located at Coonoor, South India, and studies of a similar nature at other centres. This work, and its important health-preserving results, needs to be popularized and broadcast everywhere so that people may profit thereby.

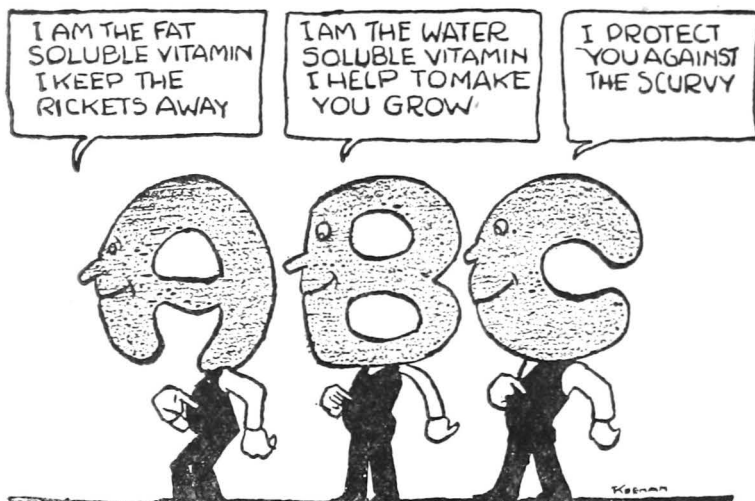
We shall let the pioneer and the pathfinder of this research in India, Sir Robert McCarrison, tell us about the nature of that work, by quoting extracts from a farewell address delivered by him at Madras, and reported in *The Oriental Watchman and Herald of Health*, for May, 1935:

"My work has been to learn how diseases arise, and in particular to learn how perfect food is concerned in keeping the body in perfect condition; and *per contra*, how imperfect food is concerned in causing it to work inefficiently and in consequence to go sick.

"In Coonoor, where my laboratories are located under conditions of the most perfect hygiene, I keep about 1,000 stock rats for my experimental work. They live in large, roomy, comfortable cages filled with straw, and they are exposed daily to the sun's rays. This stock is fed on a diet similar to that eaten by certain races of Northern India, among whom are to be found some of the finest physical specimens of mankind. The diet consists of whole wheat flour, unleavened bread (*chapaties*) lightly smeared with fresh butter, sprouted Bengal gram (legume), fresh raw carrots and cabbage *ad libitum*, unboiled whole milk, a small ration of raw meat with bones once a week, and abundance of water, both for drinking and washing purposes. During the past four years there has been no case of illness amongst these rats, no deaths from the natural causes in the adult stock, and, but for a few accidental deaths, no infantile mortality. Disease has been excluded almost completely by minute attention to three environmental conditions: cleanliness, comfort, and food.

"Turning to my experimentation rooms. Here are the same animal houses, the same cages, the same scrupulous cleanliness, the same exposure to the sun's rays. But the animals are fed on food which is faulty in one way or another—deficient in vitamins, in mineral salts, or in both—containing too much of one thing or too little of another. This is the main regard in which these animals differ from the well-fed stock. Further, as my business is to learn how the foods eaten by the people of India are related to disease, the materials entering into the various faulty dietaries are usually those in use by people in India. These are so combined as to form one-sided dietaries disproportionately rich in starch, and lacking in certain elements and complexes necessary for normal nutrition.

"During the last four years, over 3,000 of these improperly-fed rats have been examined after death: that is to



say, during the same period in which the well-fed rats remained so free from disease. The following are the morbid states we found amongst them: Pneumonia and other diseases of the lungs; diseases of the nose and the passages leading from it; diseases of the ear causing pus formations; adenoids; diseases of the eye, which may lead to actual blindness; diseases of the stomach and intestines, such as inflammation of the bowels and ulcers; stone in the bladder; premature birth of the young, or their death in the mother's womb; diseases of the skin, such as loss of hair, dermatitis, and abscesses; anæmia; dropsy; enlarged glands; goitre; neuritis; beri-beri; disease of the heart. And when other animals, such as guinea pigs, are improperly fed, scurvy, decaying teeth, rickets or softening of the bones, colitis, dysentery, and other diseases occur amongst them.

“There is another regard in which the ill-fed rats differ from the well-fed ones; the former are often nervous, irri-

table, and if they live together in colonies, the stronger often prey upon the weaker; the well-fed ones are placid, good-tempered and tractable.

“If it is possible to keep animals practically free from disease, in the way described, it must be possible to do so also in man. What proof have we that it is possible in man? One cannot take batches of children and deliberately feed them under controlled conditions on faulty food. And though when I see ill-fed children suffering from many of the ailments which I find in my ill-fed rats I may feel morally certain that these ailments are largely the results of faulty feeding, yet the lay public needs to be convinced that this is so.

“The diet of my disease-free colony of stock rats has the same good characteristics as the diet evolved through the centuries by certain races in Northern India which are distinguished by their fine physique. And these characteristics are provided when the components of the diet are as follows:

“1. Any good whole cereal grain, such as oatmeal, whole wheat, or unpolished rice, or a mixture of them.

“2. Whole milk and the products of milk—butter, curds, buttermilk.

“3. Fresh, green, leafy vegetables, carrots, tomatoes, etc., in abundance.

“4. Fresh fruit.

“5. Meat, fish, fowl, or egg occasionally, if desired. These are not necessary if milk is taken in sufficient quantity. These several classes should be the main constituents of any child's food, whether it be a slum-child or a child of the well-to-do, and whether it lives in Europe or in India.

“I conclude this address by enunciating the following principles:

“(a) Food is the foundation of health, and this foundation should be well and truly laid in childhood.

“(b) The child is made up of what he eats, and the perfect building of his body depends upon the perfection of his food.

“(c) It is to defects in the building of the body, consequent of faulty feeding, that many ailments of childhood are due, and it is to these defects that much disease and physical inefficiency in later life are to be traced.

“(d) A perfectly constituted diet is one in which the principal ingredients are milk, milk products, any whole cereal or mixture of cereal grains, green leafy vegetables, and fruit. These are the protective foods. They make good the defects of other constituents of the diet, protect the body against infection and disease of various kinds, and their use in sufficient quantity ensures physical efficiency.

“Have I told you enough to convince you that of all the medicines created out of the earth, food is the chief? Have I told you enough to thrill you with the wonder of your own bodies, and of the things that the earth provides for its nourishment? Have I told you enough to give you some idea of what I and others have been trying to do all these years? Have I conveyed to you something of the glamour, of the wonder, of the all-absorbing quality of research? Have I made you realize that the most any of us can do is so little in comparison to that remaining to be done?”

That which now remains to be done so as to give a practical application to all this valuable nutritional research, has been well sketched by Sir John Russell in his “Report on the Work of the Imperial Council of Agricultural Research.”

“The first need, in my view, is to make a nutritional survey in each province so as to discover what are the chief

deficiencies in dietary; the medical authorities should then meet the Agricultural experts to decide what crops, including fruits and vegetables, should be grown to supply the missing elements. The approximate quantities needed should be indicated, and the agricultural staffs, acting along with the rural development authorities, should then encourage, by all means in their power, the growth of these crops."

### WHAT IS NEEDED

To carry out the recommendations of the resolution passed by the Calcutta conference of women, it is necessary first of all to recognize and understand the faults of the present deficiency dietary practices obtaining in this country. Then only will it be possible to arrange a constructive and satisfactory nutritional plan suited to the several sections of India.

The diets of various provinces in India differ, and consequently their defects also differ according to economic resources and religious dietary demands. These differences and their shortcomings quite largely delimit the nature of corrective measures which must be introduced.

For the purpose of obtaining practical results it is not necessary to stress such scientific terms as vitamins, minerals, proteins, alkalis, and acids. The average individual only needs to be advised in simple and practical terms how he may effectively improve his dietary habits.

Nutritional laboratory workers have indisputably shown that the absence of certain foods from the regular diet of individuals or community groups, results in certain definite disease developments; also, that such diseases and physical under-developments can positively be avoided by regularly including in the diet those food substances which were lacking.

Certain conclusions therefore emerge from these considerations. We now know the essentials of a standard,

minimum diet which is health-promoting and health-preserving; a diet consisting of foods on which the child may develop to the full physical and mental possibilities of his birthright, and the adult avoid deficiency disorders and handicaps.

Whatever food practices may have become established in any part of India, or whatever the conditions which have necessitated these practices, there are, as is now well recognized, essential foods which every mother's son and daughter of India requires for normal physical and mental welfare. Here, then, are the foods (listed with determined amounts) which somehow, and at some time, must enter regularly into the national daily diet of this country, if the diet is to agree with the findings of universal nutritional research.

Milk, 8 to 16 ounces.

Butter or ghee, 2 ounces.

Cheese or milk curds, 4 ounces.

Green leafy vegetables (some uncooked), 4 to 6 ounces.

Non-leafy (root) vegetables, 6 to 8 ounces.

Ata, or other whole grain, 8 ounces.

Fresh fruit, 2 ounces.

The foods mentioned contain all the elements called proteins, vitamins, minerals, amino-acids, vital factors, also the heat and energy-producing carbohydrates. Without these growth-promoting and protecting factors, normal life and health are not maintained.

To these basic foods may be added, if desired, or if means are forthcoming, other foods for further strengthening or varying the diet, such as meats, fish, fowl, eggs, and a variety of vegetables, pulses, choicer fruits, cereals, and many prepared dishes.

## A Punjab Nutritional Survey

SOME extracts from the report of the Punjab Health Department for 1939, "An Inquiry Into Diets, State of Nutrition, and Factors Associated Therewith, in Relation

to Health in the Kangra Valley," throw considerable light upon the situation confronting public health and nutrition workers in India.

After indicating family budgets, food consumption, and state of nutrition of the areas investigated covering a period of six months, the report gives the following conclusions of the survey:

"The average daily diet as judged by the above figures consisted largely of cereals. In irrigated areas rice was the predominant cereal; in non-irrigated areas relatively larger quantities of wheat and maize were consumed. Pulses occupied second place in the diet. Vegetables were not conspicuous, and the amounts of green leafy vegetables consumed were very small, particularly in the non-irrigated areas. The amount of fat consumed was also extremely small and animal fat almost negligible. Very small quantities of milk and buttermilk were partaken of, and meat was almost absent from the diets.

"The outstanding features of all these diets are the preponderance of cereals and the very small quantities of milk, green vegetables, fruit, animal fat and meat included. In short, these diets are extremely ill-balanced, and contain a minimum of the 'protective' foods.

"In a group of sixty families under nutritional survey, the findings reveal the same food defects and resulting food-borne diseases as are reported from other provinces. Thus the recommendations have a broad application to other provinces as well, and the remedy called for is of universal need in all India.

"Diets are ill-balanced, consisting mainly of cereals, and containing a minimum of the 'protective' foods, viz., milk and milk products, green vegetables, and fruit. Animal fat, animal protein, and calcium are present in diets in markedly inadequate quantity, as also are vitamins A, C, and D.



"The state of nutrition is such as might be expected in a community in which diets are so defective. Approximately 50 per cent of individuals examined suffered from malnutrition in some degree. The chief morbid conditions resulting from food deficiency are osteomalacia, from which nearly 50 per cent of child-bearing women suffer, and rickets, signs of which are present in one third of the general population. These conditions are due to disturbances of calcium metabolism associated with diets deficient in calcium and vitamin D. Thirty-four per cent of individuals examined suffered from goitre: deficiency of vitamin A and iodine in diets is a probable cause.

"Chemical analysis of foodstuffs shows that the articles of diet consumed contain protein, fat, carbohydrate, and mineral matter in amounts similar to those found on analysis of the same articles from other sources. The articles of diet actually partaken of are not qualitatively defective. It is the virtual exclusion of certain classes of food-stuff (milk and milk-products and fresh vegetables particularly) from diets which apparently results in malnutrition and food deficiency disease."

*Suggested measures for improving health in the Kangra Valley.*—"It is clear that what is primarily required to meet nutritional defects in Kangra Valley is an adequate milk supply and a sufficiency of fresh vegetables and fruits."

The Punjab has the singular distinction of having produced a combined diet which is recognized as coming nearer to a balanced ration than any diet plan followed in other provinces of India. In fact, this North India diet was adopted by Sir Robert McCarrison as a standard and satisfactory nutrition on which to base his survey and experimental work at the Coonoor Research Institute. Here are the details of this diet:

Milk	20 oz.	Rice, home pounded	6 oz.
Cabbage	8 oz.	Ghee	1.5 oz.

Root vegetables	8 oz.	Vegetable oil	1 oz.
Mango	4 oz.	Dal	1 oz.
Ata	12 oz.	Mutton	2 oz.

As a constructive suggestion it is proposed that this diet be improved by reducing the quantity of *ata* and rice, and increasing the quantity of fruit accordingly.

By taking this North India diet as a standard and comparing it with the following diets as taken from real life in the provinces mentioned, their deficiencies will be readily seen, and also just where they require improving and strengthening.

## A KASHMIRI'S DIET

Rice	25.6 oz.	Vegetable oils	0.9 oz.
Wheat	1.3 oz.	Milk	2.2 oz.
Pulses	0.6 oz.	Meat, fish, and eggs	0.2 oz.
Leafy vegetables	5.2 oz.	Raw sugar	0.5 oz.
Non-leafy vegetables	1.5 oz.		

## DIET FROM THE CENTRAL PROVINCES

Rice	16.0 oz.	Ghee	0.2 oz.
Wheat	2.0 oz.	Vegetable oils	0.6 oz.
Pulses	1.5 oz.	Milk	6.5 oz.
Leafy vegetables	2.0 oz.	Meat, fish, and eggs	1.5 oz.
Non-leafy vegetables	8.7 oz.		

## DIET FROM BARODA STATE

Rice	8.1 oz.	Ghee	0.3 oz.
Milletts	11.3 oz.	Vegetable oil	0.4 oz.
Pulses	4.0 oz.	Milk and buttermilk	2.3 oz.
Non-leafy vegetables	2.6 oz.		

## DIET FROM ASSAM

Rice	19.4 oz.	Non-leafy vegetables	0.4 oz.
Pulses	0.9 oz.	Vegetable oil	0.3 oz.
Leafy vegetables	.8 oz.	Meat and fish	0.7 oz.

## DIET FROM BENGAL

Milled rice	15.0 oz.	Vegetable oil (mustard)	0.5 oz.
Pulses (Lentil or <i>arhar</i> )	2.0 oz.	Milk	1.0 oz.
Green vegetables (Brinjal, <i>sag</i> , or potato)	2.0 oz.		

## Rice Diet

A VERY large percentage of India's population subsists upon rice as the staple and main article of diet. Small quantities of leafy and non-leafy vegetables, pulses, and oil are added; but the outstanding and determining ingredient is rice.

The following list represents the actual composition and quantity of each ingredient, as constituting the daily diet of many of the needier and humbler of India's millions:

Rice	20 oz.	Leafy vegetables	1 oz.
Underground (root) vegetables	3 oz.	Oil and fats	0.5 oz.
Pulses	1 oz.	Fish, meat, or eggs	0.5 oz.

When this diet is checked by the known standards of normal, sufficient, and ample diet as given previously, it is found to be seriously lacking in vitamins, such essential minerals as calcium, phosphates, iron, and satisfactory protein.

Mothers bearing children on such a diet cannot give birth to normal offspring. Children are doomed to a defective development, and adults are enfeebled and become prone to various physical ailments resulting in a low working and earning capacity.

All this is consequent on insufficient daily supply of vitamins, minerals, and the right kind of protein. How, then, can this situation be definitely, effectively, and economically altered? It can be effectively altered, but not as economically as the situation demands. It would necessitate the earning returns of the people to be sufficiently increased to provide for the addition to the rice ration of the following food substances as a minimum requirement: 8 ounces milk, 10 ounces combined vegetables (with special emphasis on carrots and green leafy vegetables), 2 ounces of fruit, and 2 ounces of butter fat. The protein defects of rice as a cereal might be lessened by substituting whole wheat for a portion of the rice.

These additions to the standard rice diet would give new procreative virtue to the potential and the expectant mother. The developing child would have a greatly increased mental and physical life expectancy, while to the adult it would mean effective medicine for his many ailments and handicaps.

## The Animal Protein Diet

THE following two diets have been recommended by the Public Health Service of Delhi Province, and appear in literature circulated by that office.

### EUROPEAN (man)

### INDIAN (man)

	For a sedentary life		For an active life			For a sedentary life		For an active life	
	ozs.	ozs.	ozs.	ozs.		ozs.	ozs.	ozs.	ozs.
Fish	4	4			<i>Ata</i> (wholemeal) or				
Meat (including bacon)	6	6			Rice (home pounded)	10	2		
Vegetables:					Millet	5	6		
Green leafy	4	8			Milk	8	16		
Non-leafy	8	8			<i>Dal</i>	3	3		
Milk*	8	10			Vegetable oil, or <i>ghee</i>	2	2		
Butter*	2	2			Non-leafy vegetables	6	8		
Cheese*	1	1			Green leafy vegetables	4	8		
Eggs*	2	3			Fruit	2	4		
Bread	8	12			Sugar	-	1		
Sugar*	1	3							
Salt*	½	½							
Fruit	2	8							
Flour*	1	2							
Net calorie value	2,420	3,000			Net calorie value	2,440	3,000		

\*Includes amount used in cooking.

These two suggested diets for Europeans and Indians are evidently based on research work using animal flesh protein as the main source for this nutritional factor. Both diets reflect the European preference for high protein ration and for animal flesh as a preferred source for satisfactory protein.

These diet outlines are therefore best suited to those communities in India who include fish, fowl, meat, and eggs as a regular part of their ration.

It may be advisable to mention that the protein portions called for in both the Delhi outlines being on the liberal side, the quantities indicated should not be exceeded. One of India's serious food defects is the inadequate supply of satisfactory protein, particularly for the non-flesh eating communities, but this defect cannot be remedied by advocating the use of animal flesh, for there are large communities whose convictions against such practices would compel them to choose starvation rather than violate a deeply religious conviction. There are other ways of providing for the protein defect, and these non-flesh eating communities should receive particularly helpful guidance from the research services.

To find other sources of satisfactory non-flesh protein is a difficult and large problem, as large as the non-flesh eating communities themselves, representing many millions of people. But this makes the need so much more important and urgent.

There is another aspect of these two suggested diets which needs emphasis. The probable tendency will be to take less of vegetables, fruit, and milk than is called for by the outlines. This would be a very serious error, because these very foods are the real health-promoting factors of the suggested diets. It is from these that one obtains much of the needed vitamins and mineral salts. The quantities of these foods called for are really the minimum requirements; they may be increased to advantage, but decrease in quantity will invite deficiency conditions.

## Food Medicines

AFTER reviewing these details of cause and effect as related to food-borne diseases, one may better understand

why it is that notwithstanding the many schools of medicine, the various systems of treating disease, and the thousands of drug preparations so widespread in India, yet there is so little corresponding healing. This is due, as has been explained, to basic food deficiencies. No system, or mode of treatment, Eastern or Western, can correct the results until the nutritional defects constituting the cause are corrected.

The real effective remedies are to be found in a large variety of natural foods. The more useful and essential of these food remedies, and their healing constituents, may be briefly indicated in the following pages.

## Cabbage

PERHAPS you have never thought of this humble vegetable as being a valuable medicine. Included in the cabbage family are Brussels sprouts, cauliflower, broccoli, kale, palm cabbage. The medicinal value of these vegetables is best obtained when they are eaten raw.

The remedial effect depends upon the vitamins A, B, and C; also upon the calcium, iron, potassium, sodium, and phosphorus content. The juice of cabbage, even the cooked juice, is valuable for strengthening the alkali reserves of the tissues. By this means acidosis may be effectively combated.

## Spinach or Sag

IN THE green leafy plants, nature carries on her most elaborate vital alchemy. Green leaves are the very basis of life. Without them life could not long be perpetuated. Milk, which is so highly praised, is but green leaves in solution. Through these greens of different kinds, nature compounds all the essentials of life.

Perhaps the best known and most extensively used green is the group of leafy plants called spinach, or *sag*. The im-

portant medicinal value of these plant-foods will be understood from the following list of contained values: Calcium, sodium, chlorine, phosphorus, iron, vitamins A, B, C, and E, protein, and carbohydrate.

Spinach rates high for iron, vitamins, calcium, vegetable hæmoglobin, and for protein-building amino-acids.

In fact, it is to the green leafy stuff we must go to find the secret of growth, for in them is produced a substance that imparts to the young of animals the power to grow. For this reason, the juice from greens is advised for infants, and later the pulp put through a strainer.

Children should be encouraged, not forced, to like and desire green leafy foods. This is particularly true in India where growth and development is a problem so frequently met. For this developmental purpose, it is well to know that milk and green leafy foods, such as spinach, are interchangeable to a large extent, meaning that to promote growth and development, green leafy food is the most effective substitute where milk is scarce or cannot be afforded.

Very many green leafy vegetables suitable for food grow wild and may be had for the trouble and effort of gathering them. The leafy plants which we now know as spinach, or *sag*, were at one time wild and unused, until someone, somewhere, experimented and made the discovery of their nutritional and medicinal value. There are still many more green plants in the wild waiting to be found.

The reason green leafy food plants are called "protective foods" is because they contain the mineral elements which are deficient in such staple foods as rice and other refined grains. Also in their composition the alkaline minerals largely predominate. This gives them a high value for maintaining a more effective resistance against infection.

Pulses are the only source of protein for very many in India, with often unhappy results, for the reason that pulses

are an incomplete source for the eighteen amino-acids necessary to build protein tissues for the human body. It is now known that this defect in pulses can be made up by the liberal addition of green leafy substances.

There is another important service rendered by greens in this connection. The proteins of pulses require for their complete digestion and assimilation, a certain amount of vitamins A and B. This necessary supply is readily obtainable from green leaves. For this reason, when pulse forms part of any meal, there should also be added a generous amount of green leafy foods like spinach to ensure these needed protein-digesting vitamins.

Small, young, tender sprouts of spinach can be used in raw salads, for they are then as appetizing as tender lettuce leaves.

Spinach belongs to the 5-per-cent vegetables so necessary in the diabetic, detoxicating, reducing diets.

Spinach should be cooked in so little water that when finished there is none left to throw away. If it is first washed thoroughly in several changes of water, the water which clings to the leaves is sufficient for cooking without adding more.

## The Carrot

THE humble carrot has been honoured by science in true knightly fashion. Its name will ever, hereafter, be highly revered, for has it not been selected as the symbol—"carotene"—for the yellow pigment which nature employs for compounding the mystic and highly important vitamin A? This vitamin is very essential during youth to promote balanced growth and development. Its property in adult life is to maintain health.

Deficiency of vitamin A in the average Indian diet represents one of the major nutritional problems in this



country. This fact was emphasized by the Central Government's Health Commissioner in his recently published report.

Deficiency of carotene in the diet is manifest by stunted growth, chronic ill-health, low resistance to infection, particularly to such infections as produce eye, ear, sinus, and lung diseases. The effects of vitamin A deficiency are widely manifest in India.

How to correct this defect and its consequences is a practical problem to which the Nutritional Institute at Coonoor has given much attention. They recommended more extensive use of cod-liver oil and red palm-oil as an addition to the diet.

Neither of these two recommended substances are likely to find much use among the masses, because of the high cost and difficulty to obtain them readily. Milk is also a good source of vitamin A, but its liberal use is likewise restricted by the expense factor.

It is just here that the carrot may provide a helpful solution to these vitamin and economic problems. It compares well with cod-liver oil, red palm-oil, and milk as a ready source for carotene or vitamin A, as indicated by the following quantitative comparison:

Cod-liver oil	***	Coconut	*
Butter	***	Ground nuts	*
Whole milk	***	Wheat-bran	*
Carrots	**		

The daily use of carrots for children and adults, and its extensive cultivation, should be encouraged in every possible manner.

This vitamin A withstands ordinary cooking temperatures with little loss, but loses its power gradually on exposure to air and high heat. For this reason carrots should be cooked soon after being taken from the ground. The cooking is best done by the method which prevents exposure to the

air while being cooked. Cooking carrots in *ghee*, and in an open vessel, is most destructive to their vitamin-A content.

To drink raw carrot juice, in quantity of one or more large glasses daily, is an excellent and palatable way of obtaining the nutritional values of the carrot.

Still another valuable feature in the carrot is its antiseptic properties. Metchnikoff first called attention to this effect. He found that by feeding carrots to animals their stools become nearly free from harmful bacteria. These properties are now quite generally recognized at certain European spas where carrots are served in some form, or as juice, at each meal.

## Onions and Garlic

EATING raw onions and garlic is considered taboo by society and business circles. One could wish that the alcohol and tobacco breath were considered equally as indecorous. The offensive breath produced by the onion family is due to an oil which, after eating, is excreted through the lungs and therefore gives the characteristic odour to the breath. The best way of overcoming this unpleasant effect is to bake the onion by burning it in hot ashes or, better still, to cover with sand in a baking dish and then bake in a hot oven. High temperature volatilizes the oil and so renders this vegetable less aesthetically objectionable.

Even the laws of Manu V. 19 have joined in voicing this prejudice, for there it is written, "A twice-born man who, knowingly, eats mushrooms, a village pig, garlic, a village cock, onions, or leeks will become an outcaste." This was another way of keeping society free of halitosis.

Regarding onions and garlic it has been said, "They build us up physically to a remarkable degree, notwithstanding that they may tear us down socially."

Among the favourable things to be said of the onion family is that they constitute a good source for valuable alkalinizing minerals. On the other side of the picture Dr. Robert Hutchinson tells us that onions and asparagus are the only two vegetables yielding uric acid. These vegetables should therefore be avoided by persons who have an excess of, or are sensitive to, uric acid.

Dr. S. S. Nehru discusses a new value contained in onions as observed in his rural uplift station at Mainpuri:

“Vitamins have come into their own, and the whole alphabet is represented by particular foods which are carefully impressed by the up-to-date dietitian on the popular attention. But there is another type, and a newer source of energy which can be captured with profit to the human system by dietetic devices. Their type is the so-called Gurwitsch radiation, a form of ultra-violet rays which has such a powerful effect if administered in mild doses. Certain root crops are precisely rich in this form of radiation, such as onions, carrots, turnips, beetroots, etc. These are easily available in the rural area, and there is no reason whatever why the villager should not grow them on his own land and use them in his own menu. For the benefit of those who, more out of prejudice than experience, may be tempted to belittle or even deny the efficacy of this new type of organic rays, let it be noted that the rate of growth of plants exposed to roots of onions, carrots, etc., has been found by the research members of the E. F. G. A. to be doubled solely in consequence of such exposure.”

Proceedings of the First International Congress of Electro-Radiobiology, Venice 1934, p. 879, read as follows:

“M-rays are present in and emitted by young onions. These, with 2-to-1-inch diameter, are most active and only up to 24 hours after removal from the earth. On the view that M-rays are ultra-violet in character but very mild in nature, the effect of such mild ultra-violet radiation on

diseased tissue which is thereby activated is worthy of serious consideration."

## The Cucumber

THE cucumber is one of the vegetables really relished in the raw state by most people, especially in summer, as it has a cooling and refreshing effect. Nothing makes one's mouth water more readily than to see, as one so often does in Simla, a hill man coming along the Mall eating a big, juicy, fresh cucumber. Surely the trail must be wonderfully shortened for him, and made really enjoyable as he munches at his cucumber along the way. For more than two thousand years the cucumber has contributed to the gustatory pleasures of men in many lands, regardless of political or religious persuasion. Mrs. Wiser, in her book, "The Foods of a Hindu Village," writes: "In the hot weather, men, women, and children may be seen feasting on long green cucumbers. Roadside vendor stalls and religious fairs abound in cheap cucumbers, so that one cannot miss them, at home or abroad."

The cucumber, during its season, in addition to its use as a raw food, is also included in the daily cooked, spiced, mixed-vegetable dishes so universally used throughout India.

This vegetable has important values, as is evident from the following table showing mineral matter in 1,000 parts of waterfree substance:

ACID BINDING		ACID FORMING	
Potassium	41.20	Phosphorus	17.45
Sodium	10.00	Sulphur	5.90
Calcium	7.30	Silicon	7.00
Magnesium	4.15	Chlorine	5.60
Iron	1.40		
	<hr/> 64.05		<hr/> 35.95

The above mineral arrangement imparts to the cucumber definite remedial and curative qualities. We note at once

the high potassium content, 41.20 per cent, constituting an important source for this natural, organic, colloidal form of potassium. The importance of this food mineral may be judged from the prominence nature has given to it in organizing the red blood cells.

Per thousand grammes of blood-cells, the inorganic salts contained are at this rate:

Iron phosphate	0.998	Sodium phosphate	0.633
Potassium sulphate	0.132	Sodium chloride	0.344
Potassium chloride	3.079	Calcium phosphate	0.094
Potassium phosphate	2.343	Magnesium phosphate	0.060

Another point worth remembering is that the acid-binding (alkali) minerals in the cucumber represent 64.05 as against the acid-forming 35.95 per cent, thus placing cucumbers in the alkali-plus list of foods. The mineral arrangement also operates as one of the best natural diuretics, stimulating urinary secretion, and promoting a free flow of urine. For this purpose the expressed juice serves best. This same juice, when combined with the juices of carrots, beets, and celery, has very beneficial effects in rheumatic conditions.

When these juices are used to secure the above effects, all use of cereal starches and refined sugars must be rigidly excluded from the diet. Concentrated protein foods as meats, fish, fowl, eggs, and pulses must also be kept within the limit of not more than four ounces of any one or all combined during the twenty-four hours.

The above restrictions should be observed until the desired results have been accomplished. The amount of sodium content will provide for the minerals going into solution and made available for tissue reconstructions, and to eliminate waste materials.

Basic to all this benefit is nature's organized medicine capsule, called a cucumber. The conclusion is to eat more cucumbers and less of some other things which are not so beneficial to health.

## String Beans and Brussels Sprouts

HERE are together two vegetables having remarkable common values. In calcium, phosphorus, iron, and the vitamins A, B, and C they constitute a rich source, containing xx and xxx of each. There are other green vegetables equally well fortified with these essentials, so we need not dwell further thereon except to re-emphasize green vegetables in general as the real source for suitable food minerals and protective vitamins.

Our prime objective is to establish an essential yet not well-recognized relationship between these two vegetables and the needs of the diabetic patient. The diabetic person requires a food source rich in alkaline minerals and vitamins but low in carbohydrates, for diabetes is a condition of sugar and acid poisoning. This necessary food arrangement is provided for by string beans and Brussels sprouts, containing as they do only 3 per cent of carbohydrates, and being, as already mentioned, rich in the other essentials. But additionally important is the fact that they contain a quantity of natural insulin so valuable to the diabetic patient whose pancreas has lost some of the insulin-forming capacity.

The pancreas is a digestive organ having as one of its duties the task of providing a chemical substance (insulin) necessary for the processing of starch into a simple form of sugar and then into body energy. This reducing process has been lost in part, and therefore the diabetic person must look for substitutional insulin.

The first insulin to be manufactured was extracted from animal pancreas; then it was synthetically prepared. Now we are discovering a natural plant source as contained in string beans, Brussels sprouts, and some other green foods.

Besides eating these low carbohydrate foods, best results follow the liberal daily use of raw juices extracted from

string beans and Brussels sprouts. The addition of carrot and lettuce juices is also helpful.

In preparing these raw juices, the vegetables must first be finely minced in a cutting and bruising machine, then placed by layers in clean cloths and the juice expressed by means of a press such as an oil press, or other means that allow for very heavy pressure to be exerted. It is only by such a process that these most valuable, healing, and body-cleansing juices can be best obtained.

The machinery used must be washed with boiling water before and after the juice has been extracted.

## Lettuce

FOR those who appreciate the natural delicate flavour of foods, lettuce is, and has been, a favourite from quite ancient times. Augustus Caesar is reported as having been very fond of this plant, and attributes his recovery from a serious illness to the use he made of lettuce as a food. In such high esteem did he hold this lowly plant that he dedicated an altar to it and erected a statue in its honour.

It seems that this vegetable was first grown in England about the time of Queen Elizabeth. Since then it has gained in favour until today, both in England and America. There are very many persons who make a lettuce salad the main article of food for lunch. With this salad is associated either a protein or a carbohydrate food according to the plan of meals adopted. Lettuce goes well with either type of these foods.

Combining lettuce with eggs is traced back to the Romans. This provides a very wholesome and compatible combination. Other leafy or green vegetables may be added, but no form of carbohydrate should be included if eggs are to be the protein companion food with lettuce.

Other proteins as milk, curds, cheese, or meats may replace eggs. Olive-oil dressing makes a good addition.

To construct a lettuce and carbohydrate meal, any form of carbohydrate as bread, rice, potatoes, or other root vegetables may be combined, but no form of protein should then be included with this meal. This is on the principle that proteins and carbohydrates do not associate well at the same meal, particularly in the case of persons with defective digestion.

Lettuce belongs to the 3-per-cent group of vegetables. This means that these foods contain 3 per cent or less of carbohydrate. For this reason lettuce is prominent among the foods prescribed for diabetes, and in treating obesity.

The nutritional and medicinal value of this leafy food lies in its good supply of vitamins A, B, E, and it is also a really excellent source of vitamin C. In addition it supplies calcium, phosphorus, iron, and a good form of vegetable hæmoglobin. Such green leafy stuff provides one of the best iron tonics for use in anæmia. The iron and hæmoglobin obtained in this way are appropriated by the body to a much greater degree than the inorganic iron tonic sold as drugs.

The mineral content is in the form of colloidal organic compounds, this being the form in which nature prepares and most readily accepts her needed minerals for body building and health preservation.

Lettuce is a form of green leafy food, with a delicacy of flavour which makes it more readily acceptable than most raw foods. From this leafy plant one also derives that mystic vital factor so essential to life and health, which no chemist has yet been able to analyze or define. The people of India need to become much better acquainted with the value and uses of this really wonderful raw food.

The following is a good suggestion: Even where there is no garden, it is still possible to have lettuce by growing it



in boxes and pots. There is no need to wait for it to mature into an adult, fully grown plant. If eaten when young and tender, about two inches tall, it will be found most delicious. In this young form it serves much the same purpose as sprouted pulse seeds.

One occasionally meets someone who experiences difficulty after eating lettuce. This is probably due to not thoroughly masticating the leaves. Under these circumstances, the young tender sprouts are best, or the more mature leaves may be finely shredded with a sharp knife. To serve in this shredded form, or as sprouts, is perhaps the easiest way to train children to accept and learn to relish this food.

A little lemon or lime juice over the lettuce leaves helps to add interest and variety of flavour. Lemon should not be used if a form of carbohydrate is to be eaten with the lettuce.

The advertisements of cod-liver oil preparations and of ultra-violet lamps have been so insistent that we are apt to forget that green leafy vegetables contain a very high rickets-preventing quality. In this connection, it will be interesting to quote Professor H. S. Sherman: "The antiarchitic potency of cod-liver oil and of ultra-violet irradiation are so great that they have absorbed attention to perhaps a greater extent than is desirable; for the antiarchitic values of some common foods should not be ignored.

"The presence of important amounts of the antiarchitic vitamin in egg yolk, whole milk, butter-fat, and green vegetables has now been demonstrated in a sufficient number of cases so that we may regard it as fully established."

The foods mentioned by Sherman would combine well as a meal for child or adult.

### DISINFECTION

Salads are avoided by many in India for fear of contracting some form of bowel infection through eating raw,

contaminated vegetables. All raw foods should be considered suspicious, but this need not prohibit their use, as they can be rendered safe by disinfection.

Raw fruits and vegetables are not the only foods capable of carrying infection. It is well known that a very high percentage of fish, fowl, and meats are heavily infected, and even after being boiled or baked, are still capable of conveying tuberculosis, cancer, colon bacillus, trichina, and other diseases.

Salad vegetables should be washed in quite strong soap-suds, rinsed, and then immersed in a solution containing chloride of lime (quarter ounce dissolved in one gallon of water), and the vegetables left in this solution for five minutes, then thoroughly rinsed. Such treatment renders the fresh foods quite safe for use as raw salad.

## Turnips

THE turnip represents another of the originally wild growing roots now cultivated, and occupying a place of esteem as a tuber food plant. There are several varieties of turnips, the most favoured being the swede.

Although containing no starch, it is nevertheless a carbohydrate food and very useful for diabetics. Many cooks and housewives make a great mistake by using only the root portion and discarding the green tops or leaves. Both root and leaves are necessary for obtaining the best nutritive results from any tuber vegetable. The root and leaves represent a combined structure, and must be so recognized when considered as a food. The leaves should be prepared in the same way as spinach and eaten together with the roots.

One often hears the derisive allusion about not "squeezing blood out of a turnip," but one can squeeze some other things out of this vegetable which are of very great value to growing organisms, particularly from the leafy portion. Among green vegetables these turnip leaves have the

highest calcium content. The raw, freshly prepared juice from these leaves should be freely used by growing children and persons having defective calcium content in bones, teeth, and tissues. Additional mineral content are sodium, iron, and potassium. Therefore the liberal use of turnip-top juice is a very effective way of alkalizing the blood, particularly when combined with juices from carrots and celery.

When this juice is used for the purpose of hardening soft bones, it may be combined to advantage with lettuce juice to obtain the necessary magnesium. This combination is most effective for hardening the teeth.

Eat more turnips with their leaves.

## Celery

CELERY is not so popular in India as in Western lands, except among foreigners, who usually are delighted whenever it is possible to obtain a bunch of really good celery. This vegetable is mostly eaten raw. In this we may discover a valuable hint. The real nutritional, reconstructural, and remedial values of most green vegetables are best obtained when used in a raw, uncooked form. Celery lends itself very favourably to being eaten raw.

This vegetable has proven a useful aid in the treatment of arthritis, which is most probably due to its high organic sodium content as compared with calcium, the ratio being four to one. In arthritis an accumulation of inorganic calcium takes place in and about the affected joints.

The action of organic sodium is to keep lime and magnesia in solution, thus tending to prevent and relieve the arthritic joint deposits. To obtain this favourable action of celery, it is necessary to take it in a considerable quantity, much more than the usual few pieces taken as salad during an otherwise abundant meal. For this reason, when used as a remedial agent for arthritis, it should be taken in the form of freshly prepared juice. It is still better if the celery

juice is mixed with raw carrot juice in equal parts. Two or three pints of this combined juice taken daily is advisable.

Arthritis patients undertaking this treatment must reduce all denatured cereal starches and refined sugars to an absolute minimum, as they are largely the source for the inorganic calcium deposits.

## Parsley

PARSLEY is best known and mostly used as a good garnish for decorative purposes and for adding flavour to prepared food dishes. This homely aromatic green has other unsuspected values. In particular, it possesses a medicinal and restorative quality, not generally recognized. Analysis reveals that among its constituent elements are iron, acid-binding (alkali) minerals, and vitamins.

More recently attention has been given to parsley as a good source for natural organic potassium when used as part of a combination salad, or an ingredient of mixed vegetable juices.

Certain medical institutions in Europe and America are providing juice therapy regimes. Patients are placed for varying periods on vegetable and fruit juices only. In these institutions, parsley juice is used in combination with carrot, lettuce, celery, and spinach juices for treatment of kidney, bladder, and urinary-tract troubles. One authority mentions its value in corneal ulcer and other affections of the eyes.

Raw parsley juice, being very concentrated and potent, should not be used in a larger quantity than one or two ounces. It is best used freely diluted with other compatible vegetable juices.

## Potatoes

THE potato now occupies so important a place in the dietary of the world, that one wonders how the people of

various nations planned their meals before the potato was known and cultivated. It was not introduced into Europe until the time of Sir Walter Raleigh, who, like the famous tree in the garden of Eden, made both good and evil known to that country.

The potato as a really high-grade food item was demonstrated by the Danish food expert, Dr. Hindhede. His observations and conclusions were later confirmed by Dr. Rose of Columbia University.

These studies have shown that the potato must be ranked among the foods of first-grade importance. Although a vegetable, its protein content is considerable, and of high biological worth. It could actually satisfy the protein needs of the body if three pounds per day were eaten. This remarkable finding means very much for India where potatoes are among the more easily obtained articles of food.

With real advantage the potato could replace such cereals as rice, for the reason that it provides forty times more alkaline elements, such as soda and potash, which are so valuable in combating acidosis. It lacks in lime, and therefore should be combined with green leafy vegetables. The usual combination of potatoes with meats is very bad and should be avoided.

Another useful discovery is its rich vitamin content of both the antiscorbutic and antineuritic vitamins. This suggests the usefulness of potato soup or porridge as a substitute for orange juice in the artificial feeding of infants, and also for children.

In India more use should be made of dehydrated potatoes during seasons when potatoes are difficult to obtain. In this form they may be kept quite effectively.

A word of caution may be in place regarding the possible toxic effect from using imperfectly matured potatoes and those which have sprouted, also those grown on the

surface, having thus been exposed to the sun during their growth. All such potatoes contain an irritating and toxic substance known as solanin. There is a preference for small immature stock in some places, but the large mealy potatoes should be the choice variety.

Baking in an oven is the best method of preparation. When taken out of the oven, they should be squeezed to break the skin, so the enclosed steam may escape.

Boiling without removing the skins also conserves most of the protein and mineral elements, but it is important that just enough water be used as will suffice to cook them.

If potatoes are peeled in preparation, they should then be put into boiling water, not cold water, as this best preserves their food values. The water in which potatoes are boiled is valuable for making soups, as it contains both protein and minerals dissolved from the potato during the cooking process.

## Soy Beans

THE soy bean cultivation dates back about four thousand years, at which time it was already cultivated in China. As a source of protein food for the destitute multitudes of the Orient, this legume has served a large purpose. It contains 40 per cent protein, very little starch, 20 per cent fat, also lime, and vitamins A and B. The chemical reaction is alkaline, but like all highly concentrated proteins it contains a considerable quantity of purine bodies which during the process of digestion, are converted into uric acid.

Although its use as a food for man has been advocated, it has not become very popular for at least two outstanding reasons. The taste is objectionable to many people unless decidedly doctored up in preparation. Thus far the most successful preparation has been done by well-equipped food industries, where the beans can be cooked free from air under high pressure.

The cooking of these beans at home still remains a difficult problem, as they require special methods. In China the most popular mode of preparation is to soak the beans in water, then bake. An improved method is to soak the beans for ten hours in a 10 per cent salt solution, boil slowly for half an hour, and then bake.

Another plan is to sprout the beans in the same manner as sprouting *dal*, eating both bean and sprouts together.

Effective cooking to render the beans soft is best accomplished by means of a steam cooker under pressure.

In soy beans we have a vegetable protein food corresponding to meat, fish, fowl, and eggs as animal proteins. Like all such foods, this vegetable protein must be used conservatively, not too frequently, nor too constantly. This is confirmed from observations on animal feeding conducted in the United States. The effect was identical as in feeding experiments with any other concentrated protein—high blood pressure, albumin and casts in the urine, together with kidney disintegration.

The maximum usable protein from any source, under normal conditions during twenty-four hours, is about four ounces. Less is considered better by some authorities, while more than this places the organism under strain, and congestion of organs is produced.

Milk made from soy beans is said to be becoming more popular in Japan. From this milk a preparation like cheese is made called *Toffu*.

## Fruits and Fruit Cures

HISTORY does not record the circumstances that influenced man to forsake his earlier and more natural diet of fruits, herbs, cereals, and nuts, and become an omnivora, with emphasis on animal flesh. This change in food practice also brought with it results of physical deterioration and susceptibility to infectious diseases.

These deficiency consequences and their related causes are matters of more recent knowledge. As a result of this newer information we are now being urged by nutritional research workers and diet experts to reform our food habits and return to the earlier practices of our species.

We are taught that in arranging our daily bill of fare, certain elements must be included in every dietary. Those essential elements which are best supplied by fruits are the alkaline minerals, vitamins A and C, also citric, malic, and tartaric acids, and pectins. Each of these factors and the combinations of these being found in most fruits, constitute them as remedies of the highest efficiency in quite a long list of diseases.

The detoxicating action of fruits, and their effectiveness in changing intestinal germs from the putrefactive to the more friendly fermentative varieties, represents an important value.

Fruit cures are coming into great favour in medical institutions and among practitioners in Western countries. In these cures the patient is placed on an exclusive fruit diet for a period of several days. The particular fruits to be eaten are determined by the nature and requirements of the condition under treatment. Quite frequently it is possible to allow the patient to select whatever fruits he prefers with only several contra-indications.

One great advantage possessed by fruit and nut trees is their ability to draw upon minerals located at lower soil depths than can be reached by cereal and vegetable plants with short roots. The longer and stronger roots of fruit trees enable them to obtain their food minerals from deeply situated strata. Hence, fruit constitutes a more certain and richer source for food minerals.

The time has come when fruit should no longer be regarded as a mere accessory to a meal, but it must be



recognized as being among man's best and most essential health foods.'

Besides the scarcity of seasonable fruit in India, such as does grow is largely picked or knocked off before it ripens. Fruit which has not matured by the ripening process does not contain the valuable health, growth, and protection factors of fully ripened fruit. Co-operation of the village elders should be sought to secure rulings providing for the protection of fruit until it matures. A campaign is also needed to promote planting of more fruit trees and berry bushes. The mango, guava, and papaya, as well as berries, tomatoes, and other tropical fruits, thrive well in India. Certain sections are also favourable for the development of Western varieties of fruit.

## Fruitarianism

THERE are people in America whose diet consists of fruits, nuts, leafy vegetables, olive oil, honey, and occasional small amounts of prepared cereal food. The predominating diet is fruit, and the foods partaken of are chiefly uncooked. Animal foods and legumes are excluded.

Professor Jaffa of the University of California placed some such persons under observation to ascertain their daily food intake. This worked out on an average:

Protein	33 grammes	(1 1/5 ounces)
Fat	59 "	(2 ounces)
Carbohydrates	150 "	(7 1/3 ounces)
Total solid food, 11 ounces, 1,500 calories.		

Professor Jaffa details particulars of a family with three growing children who had all maintained perfect health on such a diet for seven years. The explanation of these results is to be found in the rich supply of alkaline minerals provided by such a diet. These alkaline elements protect the protein tissue molecule against premature cleavage or disintegration. For this reason the actual protein

intake requirement is very much lower than a person subsisting upon the ordinary high acid-ash-forming diet.

Dr. M. Hindhede of Denmark and Dr. C. Roesé of Erfurt, Germany, have shown that on an alkaline diet, such as indicated above, for example, it is possible to maintain health and endurance on less than two ounces of protein per day. To obtain such results the diet must provide all of the alkali minerals in abundance.

Almost yearly some new laboratory discovery regarding another food element is announced. Then follows a campaign of publicity advertising by manufacturers, urging the necessity of taking this newly discovered food factor in the form of tablets, syrups, etc. The truth regarding all these food medicines is that the only satisfactory way of obtaining everything the body requires is to eat simple, natural foods, of which green vegetables, fruits, nuts, and entire grains are the most important in providing for protective nourishment from non-animal sources.

## The Tomato

SO RAPIDLY and extensively has the tomato been adopted into the food practices of most peoples that it vies with the potato for first place among vegetables. Its composition places it among fruits rather than vegetables. Like fruits it is rich in alkali minerals and vitamins A, B, and C.

The medicinal reputation of the tomato is largely the result of its known high antiscorbutic properties. This means that the use of tomatoes in sufficient quantity will both prevent and cure scurvy.

Scurvy is a disease condition resulting from deficiency of vitamin C in the diet. Among infants the symptoms are pallor, retarded growth, no appetite, loss of weight, red, swollen gums bleeding easily, a whimpering cry, and worried expression.

Among adults the symptoms are loss of energy, sallow complexion, bleeding gums, shortness of breath, pains in the legs, small red spots on the skin, which are little hæmorrhages.

The best remedy is tomato juice or the equivalent of whole tomato, 4 to 6 ounces daily.

For infants receiving mother's milk, this vitamin factor may be supplied by giving them, after the first month, strained tomato juice, preferably uncooked. Beginning with 2 teaspoonfuls daily the quantity should be gradually increased, until by three months of age the baby is receiving 5 to 6 teaspoonfuls daily. A slight fever may result after first administering this tomato juice, as it is frequently observed, but this need not cause uneasiness, and soon adjusts itself.

In addition to its scurvy-curing powers, this fruit has other remedial values due to rich content of potassium, sodium, calcium, and iron, also to additional vitamins A and B. Citric and malic acids amount to about 0.5 per cent, while oxalic acid content is only 0.5 parts in 10,000.

## The Lemon

THIS fruit is esteemed chiefly for its juice, which has many uses and values. Lemon (or lime) juice contains 7.5 per cent of citric acid, and 2 to 3 per cent potash and phosphorus. Over a long period of years the lemon was recognized for its marvellous value as a cure and preventive of that group of derangements represented by the term scurvy. The particular scurvy-preventing property has now been identified and named vitamin C. This vitamin is a minute acid factor to which the name of ascorbic acid is given.

The potassium of the lemon is another factor whose value ranks very high, rivalling equally that of vitamin C for health-protecting powers. Potassium is an alkali mineral

and gives the lemon an important place as a ready source for alkali salts to build a reserve within the body tissues. Its effective use in treating rheumatism and other conditions of acid auto-intoxication is being recognized.

Phosphorus is necessary for maintaining growth and development of new tissues. It also promotes an active oxidation process within the body tissues.

The citric acid of the lemon is a very powerful disinfectant, but is not dangerous to use. It approaches nearest to the ideal disinfectant, being active against germs but harmless to body tissues. For this reason lemon juice, either full strength or diluted, as required, may be freely used for both internal and external purposes.

This assembly of useful elements and their combined health-giving and healing properties give to the lemon a right to a prominent place in India's national dietary.

From America come reports of the effective use of lemon juice in various combinations with other fruits for the treatment of cataract, athlete's foot, pyorrhœa, halitosis, eczema, and, not the least, acid stomach.

The effective combination of healing properties as contained in lemon juice provides a very effective and simple home remedy. More study and wider use of the lemon should be given for meeting India's manifold disease problems. Some day when its uses are better understood, it may be found that in the lemon nature has provided a natural remedial agent of wide application, with high remedial and protective efficiency and, withal, easily and cheaply obtained.

## Dates

THE nutritive value of dates in terms of calories is very high—98.4 of energy-producing power per ounce. The source of this potential energy value is contained in the simple sugar,—glucose,—of which the date has about 70 per

cent. This dextrose or date sugar differs from the ordinary table (cane or beet) sugar in being compatible to all body tissues and needs, being the natural fuel of the body. This form of sugar has already been pre-digested in the process of ripening, and is therefore ready for immediate absorption and utilization for energy purposes.

A further important fact is that date sugar is organically combined with other essential nutritive elements, as lime, iron, protein, and vitamins. Weight for weight, dates contain more food iron than meat. This arrangement of combining several food essentials into a balanced compound is nature's way of providing the correct nutrition for promoting health.

In contrast, cane sugar is a denaturalized, concentrated sweet, producing an acid-like irritation on the digestive and eliminative organs. For this reason the free and constant use of cane sugar is a frequent cause of gastric catarrh and stomach acidity. It is also believed to be a contributing cause of diabetes.

From these considerations it seems obvious that the date is a wholesome and valuable food, and a good substitute for cane sugar as a source of body energy.

One advantage of the date will especially please children; it may be used as freely as desired without damage.

Metchnikoff was first to advocate the use of dates for altering the nature of intestinal germ culture. By this means, the poisonous putrefactive germ producers of auto-intoxication may be suppressed, and the acidophilus type of bacteria encouraged. Putrefactive bacteria cannot thrive in food media where the date predominates, whereas the friendly form of intestinal bacteria is encouraged by a liberal date-containing diet.

For those suffering from constipation a liberal use of dates is advisable. Before using, dates should be thoroughly

washed, as they are usually very dirty even though they do not look so. To remove the tough outer skin, place the dates for a few moments in very hot water. This loosens the skin so it may be easily stripped off. Eat more dates.

## Milk

WE ALL make our start into life on milk. It is the infant's one perfect food, and for the developing child, milk provides the essential growth factors. Nature planned milk as a well-balanced diet to provide all the primary nutritional essentials—mother's milk for the infant, and for later periods, cow's milk with certain modifications. Experience and observation has taught mankind the world over the peculiar value of milk.

When in India, Lord Linlithgow, in a speech at Simla, made the following observation regarding milk: "It is a scientific fact beyond dispute that a liberal supply of milk is an essential constituent of diet for growing children, nor can there be the slightest doubt but that good nourishment in the early years of life is essential to the building up of a strong constitution in after life. Let me give you quite shortly the results of a very carefully conducted experiment carried out in my own country. This experiment showed that the addition of a pint of milk to the ordinary daily diet of growing boys, converted an average annual gain in weight of 3.85 pounds per boy to one of no less than 6.98 pounds, and increased the average gain in height of 1.84 inches to one of 2.63 inches."

The diet of India being so largely of a meatless nature, the providing of satisfactory protein in quality and quantity is a matter of real urgency. In this emergency there is to be found no general source for non-flesh protein so satisfactory as good cow's milk. Actual experience has shown that milk protein is superior to meat protein.

In view of this highly important finding, it becomes evident that in India dairy interests rather than the *abattoir* should receive encouragement. McCollum, writing in connection with diet in America, makes the following observations: "We could entirely dispense with meats without suffering any ill effects whatever, but if we permit the use of milk, even in the diet of adults, to fall much below the present consumption, its effects will soon become apparent in our national efficiency." The average annual consumption of milk in America is 55.3 gallons per head. Compare this with India where the annual average is only 6.5 gallons, or less than three ounces daily per head. It has actually been seen on the diet sheet of an orphanage in one of India's large commercial centres, that the growing and developing children are provided with only three tablespoons of milk each during the day. What a lifelong tragedy this entails! If America's health and vigour would be affected by reducing the milk allowance below a possible one quart, or two pounds daily, what must be the handicap for India's population with an average daily allowance per head of less than three ounces, and of its orphans with only a daily allowance of three tablespoons each of this indispensable fluid of life!

Sir Robert McCarrison wrote as follows: "If the food contains enough milk products, then it is not necessary to eat flesh meat at all; 'enough' milk is not less than one pint, and a quart if possible; but few children in India consume anything like this amount."

"The greatest nutritional need of India at the present time is the production of more and of purer milk, for there is no more important food-stuff than this, and none on which the public health is more dependent. . . . The rising generation must realize the importance of pure milk to the well-being of the people, and see to it that India shall become as enlightened in regard to milk production and to milk distribution as other countries."

There is nothing really new or recent about all this except perhaps the modern effort not only to popularize milk, but also to make it available by means of effective and scientific production and distribution.

Long ago it was written in the *Sushruta*: "Hence it proves congenial to all sentient animals. And since milk is kindred in its nature to the essential principles of life and so very congenial to the panzoism of all created animals, its use may be unreservedly recommended to all and is not forbidden in diseases due to the deranged action of Vayu or Pittam, or in ailments affecting the mind or the vascular system of man. Its beneficial and curative efficacy may be witnessed in cases of chronic fever, in cough, dyspepsia, phthisis, and other wasting diseases."

The scientists of more recent times understand better in detail than did the ancients why milk is so beneficial as food and as medicine.

It must always be remembered that all this high value of milk applies to clean fresh milk as obtained direct from the well-fed and healthy cow. Along with the need of more milk, is the corresponding necessity to understand and desire to care for the cow in a rational manner.

Boiling and pasteurizing do alter the original composition of milk somewhat, but since it is highly necessary to sterilize all milk in India, one must enlarge the diet by a liberal addition of raw fruit and raw green leafy vegetables to compensate for any nutritional loss sustained from sterilizing or boiling the milk.

Several very good dried, powdered, or desiccated milk preparations are obtainable. The milk so treated being from well-fed American, Canadian, or Australian cows is of excellent quality. When the required amount of water has been added, it represents a high grade whole milk suitable for all purposes.



Ordinary table sugar should not be added to milk, as this is very apt to produce fermentation and flatulence. Honey is better than sugar if additional sweetness is desired.

Milk should be taken in small sips, and chewed so as to mix with saliva. This prevents the formation of large hard curds in the stomach.

Perhaps the greatest value of milk for adults is in supplementary use, as a means of rounding out the biological value of other foods, particularly of a vegetarian regime. The type of vegetarian dietary so largely followed in India is incomplete. This can be rendered efficient in most instances by the liberal addition of milk and milk products, as curd, or cheese, to the daily diet.

### GOAT'S MILK

The goat, like some higher orders of life, has a two-sided nature, good and evil. The bad side was emphasized by Carl Vogt who insisted that the legend is justified which claimed the devil to have created the goat. He wrote: "It is the most destructive creature in the world in forests, and the old seats of civilization—the countries around the Mediterranean—owe the destruction of their forests, the nakedness of their mountains, and the inevitable consequences of that condition, the dryness of their climate, to the devastations of these animals."

This fact will have been noted by everyone who travels along the motor roads of India. What the goats themselves cannot reach, their herders tear down for them. In this way many useful shade trees are destroyed.

It was left for Mr. Gandhi to stress a better and more useful side of this animal. Goat's milk certainly has been associated in the popular mind with Mr. Gandhi, just as the umbrella is with Mr. Chamberlain.

Goat's milk is nutritive and is claimed to be easier of digestion by persons whose nutritional efficiency is lowered. This will apply only to certain persons, but not as a universal rule. Butter and cheese may be made from this milk as from cow's milk.

There is need to stress the importance of sterilizing goat's milk before using for the reason that it is capable of transmitting disease infection the same as cow's milk. Undulant fever has been traced to goat's milk, as also to cow's milk, and to hog's flesh when used as food. Fortunately, pasteurizing or boiling the milk will protect against this form of infection.

The goat has been termed "the poor man's cow," and as such it certainly serves a most useful purpose in India. The first cost is within reach of many who are thus provided with a source of one of the very necessary health factors. The following analysis shows how milk from the goat compares with cow's milk:

	<i>Water</i>	<i>Solids</i>	<i>Fat</i>	<i>Casein</i>	<i>Total Protein</i>	<i>Sugar</i>	<i>Ash</i>	<i>Calories Per oz.</i>
Cow	87.80	12.20	3.40	2.70	3.40	4.70	0.7	18
Goat	86.30	13.70	4.0	3.60	4.60	4.30	0.8	20

## Eggs

THE very extensive use of eggs as an important part of the human bill of fare is due to two factors. First is the ease with which they may be obtained and prepared. Railway travellers in the Punjab must have noted with interest at almost every station platform, vendors of hard-boiled eggs ready to serve. With almost equal ease this food-article can be obtained in any part of the world,—raw, boiled, poached, fried, or in omelet form. Even among people of a foreign tongue, just to make a noise like a hen and to shape the finger like an egg, is a language understood everywhere, and almost invariably produces the desired article.

The second influence tending to popularize eggs is the general impression of their high nutritive value and ease of digestion. Actual nutritional observations indicate a necessity to somewhat revise these former concepts.

The yolk, or yellow part, constitutes the real nutritional value of the egg, containing as it does the several elements suitable for nutrition, including lime, iron, and the vitamins A, B, B<sup>2</sup>, and D. All of this is conditional and determined by the nature of the food material obtained by the hen, also the ultra-violet rays absorbed by her from the sun. This indicates that an egg is not necessarily an egg by appearing like an egg. There are impoverished eggs, just as there are impoverished animals and impoverished children, because of inadequate ration.

One concept needing to be revised concerns the white portion of the egg. Several investigators have shown that raw white of egg, contrary to popular opinion, is not acted upon by the digestive fluids, and, therefore, not digested. It is evacuated from the body unaltered, just as it entered. Still further, it actually hinders the digestion of other foods. This means that raw white of egg is not suitable as food, and above all unsuited for invalids and children. Light cooking renders the white more digestible. The yolk of the egg, on the other hand, is found to be easily digested when eaten either raw or cooked.

The egg solid consists of 12.5 per cent protein, 12 per cent fat, and 1.1 per cent mineral matter. Having an excess of nitrogen, fat, and phosphoric acid, they are acid-ash forming, and therefore listed among the foods which have an acid end-effect. For this reason eggs should be eaten with green vegetables and other alkali-ash-forming foods. The popular combination of eggs on toast, eggs with bacon, or ham, also eggs with rice, is a nutritional mistake.

Another fact not sufficiently understood is that a goodly number of persons are egg sensitive, and become egg sick

whenever they eat food containing eggs, but they are apt to be unaware that it is eggs which produce headaches, nausea, fatigue, asthma, hay fever, cold in the head, bronchitis, skin eruptions, colitis, and diarrhœa, from which they suffer. This condition of susceptibility to certain specific foods is called food allergy.

○ For the benefit of individuals preferring not to include eggs in their bill of fare, it can be stated that all the food elements contained in the egg may be obtained from a diet containing an adequate quantity of milk and milk products (as butter and curd), vegetables, fresh fruits, and entire cereals. By comparing the lime (calcium) and iron content of eggs with that of other foods, the following will be interesting and significant for such Hindu friends as refrain from eating eggs or fresh meats. An ordinary serving of spinach (*sax*) provides as much food iron as three or four egg yolks. Half a pint of milk contains lime equivalent to more than ten yolks of eggs. An ounce of turnip tops supplies the lime content of four egg yolks, while an ounce of mustard greens equals the lime contained in six yolks.

## Balancing the Non-Flesh Diet

CONSIDERING a basic plan for those diets of India from which flesh meats are excluded, we can do no better than refer to the following statement by Sir Robert McCarrison:

“A diet consisting of any *staple grain with milk, milk products, and green leafy vegetables*, contains not only the right kind and amount of proteins, but everything else the body needs for health, strength, and well-being.”—“*Food*,” p. 21.

“Fruit and berries serve some of the same purposes as green leafy vegetables. They are among the best of all food-stuffs, and should form a considerable part of our daily diet.

They contain much mineral salts of the alkaline kind, which keep the blood pure and prevent its becoming acid or sour; fruits are most useful in keeping the bowels healthy and active."—"Food," p. 88.

According to this great nutritional authority and also information gained from other research centres in India, the non-flesh-eating communities may with confidence plan a fully satisfactory diet somewhat as follows, the foods being listed in the order of their relative biological importance:

8 to 10	ounces	milk
4 to 8	"	green leafy vegetables
4 to 6	"	non-leafy or root vegetables
4	"	curds, cheese, or 2 eggs
2 to 4	"	fresh seasonable fruit
6 to 8	"	home-milled wheat, rice, or millet
2	"	of either butter, cream, <i>ghee</i> , or vegetable oil
2 to 3	"	<i>dal</i>

The staple foods on which the various diets of India are usually based are wheat, rice, and millet.

All grain or cereal foods are rich in starch or heat-giving properties, but as they do not contain a sufficient amount of other essential food elements, these must, of necessity, be supplied by foods in determined quantities, containing these elements. Otherwise the normal body structure and state of health may not be attained or maintained.

The determined means of correcting such diet deficiencies is the liberal use, in amounts previously indicated, of horticultural and dairy products (such as milk, milk curds, butter, or *ghee*), fresh fruits, and substituting wheat for an equal part of the rice or millet.

From the studies of Professor McCollum we learn that a fleshless diet, including milk, has been found "the most highly satisfactory diet ever adopted in the nutrition of man."

In India there are large sections of country whose inhabitants are attempting to subsist upon a meatless, milkless, and

eggless diet, often with disastrous physical results. In the main these results may be attributed to the poor quality of protein provided by the foods composing such diets.

Much work remains to be done before a satisfactory working solution can be developed for supplying a suitable all-vegetable, non-milk source of protein combination available to those "economically disinherited" ones for whom milk is an impossible luxury.

A beginning toward a solution of this problem has been made by the discovery that a diet composed of the following food quartet will supply a fairly satisfactory balanced ration: entire cereal grain, vegetables, nuts, and fruit.

The principle is this: From the selection of several kinds of partly satisfactory protein foods like cereals, pulses, and nuts, it is possible to provide the necessary quantity of protein. The remaining factors required to make up the complete protein quality may be supplied by the green leafy vegetables. With the addition of fruit this same selection plan provides for the needed minerals and vitamins.

The nuts help to supply the protein and fat which otherwise are best obtained from milk. Much more attention should be given to the use of nuts as a regular part of the meal. It should be specially stressed that they should never be eaten between meals as they are a concentrated food of high nutritional value.

Food chemists at Yale University and Southern California have shown that animals have maintained normal growth, over long periods, on diets in which almonds, ground nuts, English walnuts, filberts, and pine nuts have furnished the source of essential protein ration.

These observations also indicated that nuts are the source of abundant water-soluble vitamin B.

## SOMETHING CAN BE DONE

Have we drawn aside the curtain sufficiently to reveal the existing condition in India of extensive nutritional inadequacy—a condition so serious and distressing as to constitute a real state of national emergency?

It seems quite safe to estimate that fully 75 per cent of 400,000,000 people living in India are in various stages of handicapping diseases, deformity, infection, physical and mental under-developments, all resulting from the lack of certain simple, natural food substances in the daily diet.

Experimental science has revealed that the major and minor afflictions abounding in India are the direct result of disregarding proper proportions and amounts of these foods in the diet. There is excess use of carbohydrates, as grains and sweets, while on the other hand there is deficiency or entire absence of the now recognized equally essential dairy, garden, and orchard products.

Something can be done so definitely as to produce a transformation, a wonderful transformation of the entire picture from Peshawar to Cape Comorin. This, however, calls for hard work and a veritable army of agricultural uplift workers.

The remedy for the food deficiency disorders is food medicine. This remedial food must be grown in every available uncultivated village area. (It can also be grown in boxes by those living in the cities.)

The quickest way of bringing first aid to those suffering from food deficiency disorders is by extensive production of green leafy and root vegetables and by teaching the people how to make daily adequate use of them.

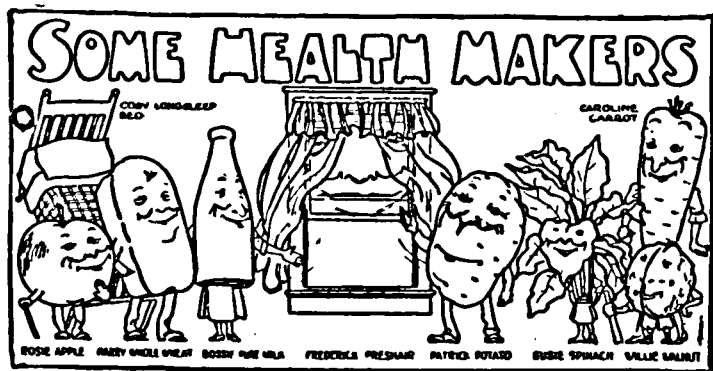
The root cause of the food deficiency disease problem is agricultural. Over-emphasis has been placed on cereals,

for the reason that they are more easily sown, cultivated, stored, transported, and prepared for food. With this has come a neglect of cultivating essential protective and growth foods, till now the average farmer in India does not know how to grow garden foods. He considers it to be the *mali's* work, and quite out of his line.

To correct this situation considerable well-thought-out and wisely directed propaganda will be required, also co-operative effort between government departments and private voluntary services.

During the past century India has experienced great benefit from numerous medical missionary hospitals and dispensaries. These have rendered heroic services in relieving and remedying surgical and medical conditions which are now recognized as largely resulting from faulty diet.

Is it not time now, and also imperative, that we see a new kind of medical missionary preventive service in the form of agricultural medical missionaries, whose efforts will be directed toward preventing the development of food-deficiency diseases?





Missionary families of this type would settle in strategic locations, where, by example and teaching, they could influence large sections of the surrounding population to adopt the new way of cultivating and preparing food, and eating for health and not for disease as at present.

Along some such lines it may be possible to hasten the day visualized by Dr. Victor Heiser when he wrote: "I should like to see the day when man will eat the foods which will grant him sound physique, mental tranquillity, and freedom from dietary disease."

Perhaps, some day, a vigorous young congress or other party will arise, directed toward accomplishing some practical things in its day. Would not the following be a worth-while slogan: Grow more carrots, cabbages, and tomatoes! The sign suggested for their banner might be an Indian village, but with a vegetable garden being worked by all members of the family.

India is constantly faced with the possibility of the failure of the monsoon rains, with consequent drought and the danger of famine conditions developing in certain districts. Under such circumstances it is necessary to encourage the extensive cultivation of foods having keeping properties, permitting of large scale storage, and easy transport and distribution. The cereals, or grains, fulfil these requirements best. Therefore, in planning to improve India's diet practices, it must be recognized that such foods will maintain the central place as essential staples, around which the altogether sufficient meal is to be constructed.

Consequently the circumstances do not demand a reduced production of rice, wheat, barley, millet, oats, and other grains, but certain changes in the way they are incorporated into the diet, and also a large scale production and use of the associated protective foods.

The differing physical conditions of India's peoples, and their proneness to the various diseases obtaining in this land, are to be accounted for chiefly, and determined largely, by the faults inherent in the staple grain crop more extensively grown and consumed in each particular section of the country.

It must be understood that the particular cereal in itself is not the actual cause for the characteristic diseases. The physical defects and maladies are not the consequence of what these cereal grains contain, but of what they do not contain in their structure. For this reason these results are called deficiency diseases.

To nutritional research has been given the task of discovering how and by means of what other foods these defects may be corrected, and deficiency consequences avoided. Human observation and animal experiments reveal that whatever form of cereal may be in use, the defects of all must be corrected by means of the same accessory foods.

There is one further observation related to the preparation of grains which requires frequent emphasis, so that its significance may not be overlooked. This refers to the mineral loss sustained when grains are highly milled and polished. In this so-called refining process, the outer covering, namely the pericarp, or bran, is removed for the purpose of making the wheat flour or rice appear whiter and purer. In this process of removing the outer bran covering, the major content of calcium, phosphorus, and magnesium, most of which is found near the outer layer of the grain, is also removed.

## Vitamins

By a careful study of the following outlines and tables one may discover the best way of correcting vitamin deficiencies.

## VITAMIN A

This vitamin is very essential to the child. It maintains normal development and resistance to infections in children and adults.

Deficiency of this vitamin in the diet results in eye trouble, retarded growth, loss of weight, lack of interest, susceptibility to infections, and respiratory diseases.

*Food Source of Vitamin A:*—Whole milk, butter, cream, cheese, cod-liver oil, fresh green vegetables, tomatoes, carrots, sweet potatoes, green peas, mango, ripe papaya, dates (Persian), jack fruit, orange, Bengal gram, soy beans, coriander.

## VITAMIN B

This vitamin is necessary for the maintenance of life and health at all ages. Deficiency results in loss of appetite, retarded growth, serious digestive and nutritional disorders, diarrhœa and mucous colitis, constipation, beri-beri, neuritis.

*Food Source of Vitamin B:*—All green vegetable tissues, tomatoes, root vegetables, some fruits, ground nuts, some whole cereals, yeast, human food gram, soy beans, radish, beetroot, cauliflower, skim milk powder, sweet potato, internal organs of animals, but not of fowls.

## VITAMIN C

Deficiency of this vitamin produces pyorrhœa, decay of teeth, ulcerations of stomach and bowels, poor digestion, under-nourishment, bleeding from mucous membranes, reddish skin eruptions.

*Food Source of Vitamin C:*—Lemons, oranges, pineapples, pomelo, guava, papaya, tomatoes, coriander, cabbage, drumstick, lettuce, spinach, parsley, amaranth, green beans, green peas, cauliflower, turnips, sweet potato, sprouted seeds, bitter gourd, green chillies, internal organs of animals fed on green foods.

## VITAMIN D

This vitamin prevents and cures rickets and other forms of mineral malnutrition.

Deficiency in a child's diet results in deformity and bone disease, with anæmia and under-nourishment.

With adults the symptoms are those of acid auto-intoxication, frequently terminating in rheumatism, neuritis, diabetes, and Bright's disease.

*Source of Vitamin D*:—Ultra-violet spectral rays. Vitamin D is absorbed by the blood when the skin is exposed to the sun and rays from a quartz mercury vapour generator. Also foods exposed to such rays absorb and retain vitamin D. It is also found in some specimens of cod-liver oil, egg yolk, and milk, but not always. The only reliable source is spectral rays.

## VITAMIN E

Vitamin E prevents and relieves sterility in both sexes.

*Food Source of Vitamin E*:—Lettuce, meat, whole wheat, wheat germ, rolled oats, large quantities of milk, dried alfalfa grass.

## FOOD PRODUCTS AS SOURCES OF VITAMINS A, B, AND C, ACCORDING TO SHERMAN

<i>Food</i>	<i>Vitamin A</i>	<i>Vitamin B</i>	<i>Vitamin C</i>
Almonds	.. x	xx?	*
Artichoke	.. -	x	-
Apples, raw	.. x	x	xx
Asparagus	.. *	xxx	*
Bananas, raw	.. xx	x	xx
Barley, whole	.. x?	x	-
Beans, navy	.. x	xxx	*

<i>Food</i>		<i>Vitamin A</i>	<i>Vitamin B</i>	<i>Vitamin C</i>
Beans, soy	..	X	XXX	*
Beans, sprouted	..	X	XX?	XX
Beans, string, fresh, raw	XX	XX	XX	XX
Beans, string, cooked	..	XX	XX	
Beetroot	..	*	X	*
Beet leaves	..	XX	X	*
Beet stems	..	*	X	*
Bread, white, water	..	?	X	-
Bread, whole wheat	..	X	XX	?
Butter	..	XXX	-	-
Buttermilk	..	X	XX	X variable
Cabbage, green, raw	..	XX	XX	XXX
Cabbage, head, cooked	..	X	XX	X
Carrots, fresh, raw	..	XX	XX	XX
Carrots, cooked	..	XX	X	X
Cauliflower	..	X	XX	X
Celery, bleached stems	..	- to X	XX	*
Celery, bleached leaves	..	X	XX	*
Celery, green leaves	..	XX	XX	*
Cheese, full milk	..	XX	*	*
Chestnut	..	*	X	*
Coconut	..	X	XX	*
Coconut oil	..	-	-	-
Cod-liver oil	..	XXX	-	-
Corn (maize) white	..	- to X	XX	-
Corn (maize) yellow	..	X	XX	-
Corn oil	..	?	-	-
Cottonseed oil	..	?	-	-
Cream	..	XXX	XX	X variable
Cress	..	*	*	X
Cucumber	..	*	X	XX?
Eggs	..	XXX	X	X?
Egg white	..	-	*	*
Egg yolk	..	XXX	X	*
Eggplant (brinjal)	..	*	XX	*
Endive	..	X	*	X
Fish, fat	..	X	X	*
Fish, lean	..	- to X	X	*
Flour, white	..	-	X	-
Flour, whole wheat	..	X	XX	-
Glucosé	..	-	-	-
Grapes	..	*	X	X
Grape juice	..	*	X	X
Grape fruit	..	*	XX	XX?
Honey	..	-	X	-
Legumes, sprouted	..	*	XX?	XX
Lemon juice	..	?	XX	XXX
Lentils ( <i>dal</i> ), dry	..	*	XX	-
Lettuce	..	XX	XX	XXX

<i>Food</i>	<i>Vitamin A</i>	<i>Vitamin B</i>	<i>Vitamin C</i>
Limes	.. *	X	X
Mango	.. - to X	*	X
Meat (muscle)	.. *	X	X to XX
Milk (whole)	.. XXX	XX	X variable
Milk, "scalded"	.. XXX	XX	X
Milk, condensed	.. XXX	XX	X
Milk, dried, whole	.. XXX	XX	X
Milk, dried, skim	.. X	XX	X
Mutton	.. - to X	X	?
Oatmeal	.. - to X	XX	-
Olive oil	.. -?	-	-
Onions, raw	.. - to X	XX	XX
Onions, cooked	.. - to X	XX	X
Orange juice	.. X to XX	XX	XXX
Orange peel	.. X	X	XX
Palm oil	.. X	-	-
Parsley	.. *	XX	*
Parsnips	.. -?	XX	*
Peaches, raw	.. *	*	XX
Peanuts	.. X	XX	*
Peanut oil	.. -	-	-
Pears	.. *	X	*
Peas, young green	.. XX	XX	XX?
Peas, dry	.. X	XX	?
Peas, sprouted	.. X	XX?	XX
Pine nuts	.. X	X	*
Pineapple, fresh raw	.. XX	XX	XXX
Potatoes, sweet	.. XX	X	*
Potatoes, white, raw	.. X	XX	XX
Potatoes, white, boiled 15 minutes	.. X	XX	XX
Potatoes, white, baked	.. X	XX	X
Prunes	.. X	X	-
Radish	.. *	X	*
Raisins	.. ?	X	-
Rhubarb	.. X	*	X
Rice ("polished"), white	.. -?	-	-
Rice, whole grain	.. X	XX	-
Rutabaga	.. XXX	XX	XXX?
Rye, whole	.. XXX	XX	-
Spinach, raw	.. *	XXX	XXX
Spinach, dried	.. -	XX	*
Starch	.. -	-	-
Sugar	.. -	-	-
Tamarind, dried	.. *	*	X
Tomato, raw	.. XX	XX	XXX
Tomato, cooked	.. XXX	XXX	XXX
Tomato, tinned	.. XX	XXX	XXX
Turnip	.. - to X	XX	*

<i>Food</i>	<i>Vitamin A</i>	<i>Vitamin B</i>	<i>Vitamin C</i>
Veal	.. *	x	*
Walnuts	.. *	xxx x?	*
Wheat, bran	.. x	xxx	-
Wheat, embryo	.. x	xx	-
Wheat, whole	.. x	xxx	-
Yeast	.. -	xxx	-
Yeast extract	.. -	-	-

x indicates that the food contains the vitamin.

xx indicates that the food is good source of the vitamin.

xxx indicates that the food is an excellent source of the vitamin.

- indicates that the food contains no appreciable amount of the vitamin.

? indicates doubt as to presence or relative amount.

\* indicates that evidence is lacking or appears insufficient.

## Help the Child to Mature

BULLETIN No. 2 of the U. P. Government contains the following valuable advice for mothers and children and deserves much wider circulation:

“Plan the children’s and your own meals something like this:

“*Morning*:—Left-over cakes of wheat or mixed flour, or ‘*Satua*’ (parched cereal) ground finer than for the men. Milk or buttermilk with either one. Allow at least 1 *pao* (1 cup) for each of the children. Fruit, if there is any.

“*Noon*:—Fresh cakes of wheat or mixed flour. Vegetables—potato and one other. Pulse broken up and cooked thoroughly, with mango, fresh or dried, to flavour it. Or sprouted pulse.

“*Night*:—Cakes left from noon, with green vegetable cooked in usual way, one cup of milk or buttermilk for each of the children.

“Set regular meal hours for the children and yourselves, as for the men. Ask the children to bring home the eatables they collect from the fields and groves, and share them with you at mealtime. Let them play in the sunshine as they do now, with as few clothes as they now wear.

“For the mother of a new baby, I would add the following:

“(1) Nurse him for two years, if you want to, and if neither you nor he loses weight, begin supplementing your milk with goat’s or cow’s milk when he is about a year old, so that he will accept it when your milk is insufficient.

“(2) Eat the same kinds of food that you prepare for the children but eat more of them, and drink milk if you can possibly get it. You are feeding the baby as well as yourself.

“(3) If the baby shows no gain in weight, or cries a great deal, start giving him other food, gradually.

“(4) Do not feed him whenever he cries, but try to feed him four times each day, when the shadows are at the same place.

“(5) When you start giving him other food, do it gradually, beginning with boiled goat’s milk diluted with water. You can give him some of the rice water which you drink. Put a little partly ground wheat in a small kettle if you have it, and let it stand beside the milk that is simmering. When it has cooked several hours, strain it and give the liquid to him. When he is about a year old, you can give him some of the potato and other vegetable which you cook, before adding the spices. Mash the vegetable with your cooking spoon. Give him some of the liquid from the green leaves which you cook, before adding spices. Let him have a taste of the egg-yolk prepared for one of the



older children. As he gets used to it, add more, until he has one yolk each day. When he has plenty of teeth for chewing, give him a piece of toasted bread, hard enough so that he must chew it before swallowing. Be sure that the flour used in his bread is finely ground. If you cannot get tomato or orange or cabbage juice for him, give him some raw potato, scraped off with the bowl of the iron spoon. As he gets older, give him some of the split pulse cooked for the family, but cooked longer, and mashed. Better still, cook some of the sprouted pulse for two or three minutes for him. Cook the milder fruits which the children bring home, sweeten them, and give him the juice. Later he can have the pulp. As he grows, increase the milk to at least half a quart."

