

Secrets of good health / by Sir W. Arbuthnot Lane.

Contributors

Lane, William Arbuthnot, 1856-1943.

Publication/Creation

London : W. Heinemann, 1927.

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**SECRETS OF
GOOD HEALTH**

By

SIR W. ARBUTHNOT LANE, Bart., C.B.
President of the New Health Society

SECRETS OF GOOD HEALTH

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**THE CULTURE OF THE
ABDOMEN**

**THE CURE OF OBESITY AND
CONSTIPATION**

By F. A. HORNIBROOK,

With a Preface by
SIR WM. ARBUTHNOT LANE, BART.,
C.B.

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WM. HEINEMANN
(MEDICAL BOOKS), LTD.

SECRETS OF GOOD HEALTH

BY

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CONSULTING SURGEON TO GUY'S HOSPITAL AND TO THE HOSPITAL FOR SICK
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LONDON
WILLIAM HEINEMANN
(MEDICAL BOOKS) LTD.

1928

17967239

First Published, July, 1927.

New Impression, March, 1928.

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*Printed in Great Britain by The Whitefriars Press, Ltd.,
London and Tonbridge.*

FOREWORD

IN October, 1925, I was invited by the Editor of the *Daily Mail* to write a series of brief and simple articles on the principles underlying the promotion and maintenance of good health. The project achieved its object to a degree far beyond the hopes of even the most optimistic amongst us. Thanks to the enterprise and remarkable vision of the *Daily Mail*, millions of people have learnt how to regulate their general habits and arrange their diet in a way that will redound to their great and lasting advantage. Thousands of letters have been received by the Editor and myself affording the clearest evidence of the incalculable value of health education. A large proportion of these letters have urged the great expediency of republishing the articles in book form. The present little work is the result, though the *Daily Mail* is continuing to publish similar articles for an indefinite period.

I have to thank the many medical members and food experts of the New Health Society for their valuable assistance at various points in the series. The work of the Society has increased by leaps and bounds. The New Health Society has become the greatest movement of this age, and will have the profoundest influence upon the health and happiness of the community.

W. ARBUTHNOT LANE.



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SECRETS OF GOOD HEALTH

CHAPTER I

INTRODUCTION

THE PRICELESS GIFT OF HEALTH

THE Press has made innumerable efforts to interest and educate the public in the vital importance of health, realising that much of the misery and dissatisfaction that exist so generally is very largely dependent on a lowered vitality and an inability to get that amount of pleasure and happiness out of life that each individual feels that he has a right to enjoy. That this is the case there is not the slightest doubt, and it has got to be recognised that it is the duty of those who are able to communicate knowledge to do so.

Many are inclined to consider that wealth and position represent the sum total of success for which they should strive, but those who are thoroughly familiar with the lives of the highly successful know how readily the most prosperous man would barter the great bulk of his possessions if he could obtain in return vigorous, robust health.

PRACTICAL ADVICE

It was for this reason that I gladly accepted the invitation of the *Daily Mail* in 1926 to con-

tribute from time to time to its columns brief articles of practical advice on "How to keep well."

These hints will explain in simple, non-technical language, how and why the human organism benefits or suffers from the various physical influences to which it is subjected under the complicated conditions of modern life and diet.

Thanks to the publicity which the Press, and especially the *Daily Mail*, has lately been giving to this vital matter of popular hygiene and nutrition, a very large section of the public is now deeply interested in so ordering their lives that they may enjoy the maximum of health and well-being. Our aim will be to help in that entirely praiseworthy and natural endeavour.

The function of the medical man has too long been limited to curing ailments which elementary knowledge of the rules of health would have prevented.

Very much of the sickness and suffering in the world is due solely to ignorance of elementary facts about the body and its functions.

The great object of the wise man is to be healthy, and the desire of such a man should be to attempt to confer on his fellow-creatures the incomparable benefits and advantages which good health alone can afford. How much crime is due to ill-health and to a desire to secure to the individual some financial means by which he can obtain his share of the food and comforts necessary for health!

Several years ago the *Daily Mail* was impressed by the fact that white bread is a bad food, that the most eminent dietitians in the world considered

that it was deleterious to the health of the community, particularly as it formed a very large proportion of the diet of children and of the poorer classes. Those responsible for the health of the people concurred in this view, believing that it was a criminal act to deprive the wheat of the ingredients essential to health and to give the degraded products to the people, and to fatten hogs and other animals on the invaluable constituents which the miller had so carefully extracted from the grain.

A letter appeared in the *Daily Mail* supporting these views signed by many medical men very eminent in their profession. The result of this was very disappointing. Inquiries from important caterers brought to light the fact that occasional demands for the new bread were made by customers for a short time, but at the end of a few months these ceased altogether.

NEW HEALTH SOCIETY

This was due to want of effective support by those who were in a position to influence public opinion. The medical profession is, generally speaking, too occupied in its fight against disease to be in a position to further a public-spirited effort such as that made by the *Daily Mail* in this instance. The New Health Society has been formed with this very object, and has set up machinery by which matters of similar importance concerned with the public health, which are referred to in the Press and represent the strivings of the public in this direction, can be reinforced and directed. The objects of the New Health Society, briefly stated, are :—

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(1) The education of the public in diet and habits.

(2) Efforts to promote the supply to the people of fruit, vegetables, and green food at a reasonable price.

(3) To encourage a return of a large proportion of the people to the land, making this possible by efficient education in intensive gardening, the care of cattle, and so on.

CHAPTER II

PRODUCING A C 3 RACE

IF there are any members of the public who are in any doubt as to the necessity for the methods which the New Health Society is adopting to improve the physique of our people and to free them from disease, the remarks made by Lieut.-General Sir Matthew Fell in a speech delivered at the Council dinner of the British Medical Association, 1926, will give them plenty of food for thought, and perhaps fill them with sadness and depression.

ARMY REJECTIONS

Sir Matthew Fell stated that the number of applicants for enlistment is very greatly in excess of requirements ; that 35 per cent. of the men who pass the recruiting officers are being rejected on medical examination, and that the proportion turned down at sight by the recruiting officers is very much higher.

This means that more than two-thirds of the young men who try to go into the Army, and are presumably and probably above the general average in physique, are C 3. Can any statement be more damning or more conclusive of the utter futility of the present state of ignorance of the rules of health ?

Out of this mass of what is practically and

essentially an unhealthy, badly fed and diseased community our hospitals are supplied with thousands of applicants for outdoor or indoor treatment, who throng the doors of the various institutions in the hope of obtaining relief to their suffering.

Yet some are ready to criticise the New Health Society for attempting to stem this torrent of depreciated vitality, miserable physique, associated unhappiness, and consequent degeneration and disease.

EDUCATING THE PUBLIC

Is it any wonder that our people are discontented with present conditions, and that they resort to drink and crime to mitigate their mental and physical depression ?

Instead of tolerating opposition to the wise aims of the Society, the public should insist on their being supported, not only by public subscription but by State aid.

The medical profession as a body should be in the van of progress instead of quibbling about signing names to articles by which it is hoped to help and instruct people. They should avail themselves of any opportunity of helping the New Health Society to carry on its beneficent work, which is the most important endeavour that has ever been undertaken to improve our race.

The Society has no quarrel with the B.M.A. and would gladly welcome their help and co-operation and that of any other body to carry out a duty to humanity, which cries out for their assistance, as is demonstrated by the appalling statement of facts made by Sir Matthew Fell, the substance

of which has long been known to the medical profession.

Instead of begging for funds to build new hospitals, new asylums, and so on, let the authorities insist that the medical profession shall teach them how best the present condition of physical degradation of the people can be met by the most ample instruction in the laws of health and by the provision of proper diet.

This last is rendered difficult, if not often impossible, by the great cost entailed by the carriage of fruit and vegetables to our large centres of population, where our people are herded in ignorance and are not getting their fair share of the happiness of life which is their due.

Let these governing bodies realise their responsibility and act promptly and efficiently, knowing that they will be supported and encouraged in every possible way by the vast majority of the British public in any action which they may adopt, however thorough and radical it may be.

CHAPTER III

THE VICIOUS CIRCLE OF DISEASE

IN order to become familiar with the factors upon which the New Health Society bases its existence it is necessary to realise "that we bear a simple mechanical relationship to our surroundings and that any change in this relationship necessitates a corresponding change in our anatomy."

This is a most important law, perhaps the most important law as regards the evolution, health, and well-being of the human race, though it applies equally to the animal kingdom.

Its truth can be demonstrated in the clearest manner possible by the study of the characteristic changes which take place in the skeletons of men who spend their lives in laborious occupations.*

Unfortunately, it is also true "that any change that develops to meet the altered mechanical relationship of the individual to surroundings during a single lifetime tends to shorten life."

ARTIFICIAL HABITS

These laws apply in a most serious manner to the gastro-intestinal tract. In civilisation it is the practice to insist, in the case of children emerging from infancy, that the large bowel shall retain the products of digestion of twenty-four hours,

* For a fuller treatment of this principle see the author's article in *New Health*, March, 1927.

whereas it was evolved to hold only a sixth or an eighth at that age.

At that early period of life nature is most active in its endeavour to meet the disability entailed by the over-distension of the large intestine. This it does by acquired bands and membranes in such a way as to oppose its elongation and distension.

Unfortunately these bands steadily spread and contract, and in consequence interfere later with the function of the bowel. Arising out of this a sequence of mechanical changes ensues in the proximal large bowel, which tends to elongate and to become obstructed by the development of similar bands at definite points in its length.

Material accumulates in the small intestine by its weight only while the erect posture is assumed, and drags upon the end of the siphon trap of the small intestine, called the *duodenum*, obstructs its effluent, distends this loop, and causes its lining membrane to become gorged with blood, to bleed, and later to ulcerate.

ORIGIN OF CANCER

To obviate further distension, the circular muscle which controls the effluent from the stomach contracts spasmodically, the stomach dilates in consequence of the accumulation of its contents, its pumping action diminishes in proportion as material collects in it, its mucous membrane tears along the area of greatest strain and bleeds and ulcerates.

As nature has no further effectual means of dealing with this altered mechanical relationship, these ulcers become chronic, and later form the nidus for the growth of cancer organisms.

In addition to these mechanical changes consequent on obstruction, infection of the body's food supply produces disastrous and far-reaching results.

The importance of paying the closest attention to the normal functioning of our intestinal organs is obvious, and explains necessary repetition in this work.

The toxic results of the retention of an excessive amount of decomposing and decomposed matter in the large bowel for a prolonged period of time, or in other words, of constipation, may now be considered.

When retained for too long, this matter stagnates and putrefies in the large bowel, irritates and annoys the mucous lining of this portion of the intestine, and causes it to become inflamed. This condition is commonly described as colitis.

The infective process gradually but steadily extends backwards along the colon and spreads into the appendix, which becomes inflamed and produces a condition called appendicitis, with which the public are only too familiar.

The organisms which break up and disorganise such material as escapes in an undigested form from the small bowel readily ascend into the contents of the small intestines, which have accumulated there because of the difficulty of their evacuation into the already overful large bowel. The invasion of what should be the sterile products of digestion in the small intestine by foul and dangerous organisms, which grow only too readily in such a suitable medium, produces poisonous materials or *toxins* which, with the

organisms, are picked up by the blood vessels and lymphatics.

POISONING THE BLOOD

The function of these vessels is to convey the material absorbed from the contents of the intestine to the liver, whose duty is to eliminate certain harmful materials, or to convert them into substances which are innocuous and can be discharged, especially through the kidneys and bladder.

This function these organs effect perfectly as long as conditions are normal—that is, as long as the food contents of the small intestine are sterile. When, however, they are infected by organisms, such organisms and the products of their action throw so severe a strain upon the function of the liver that the organisms get into the general blood stream, and the toxins or poisons are incompletely dealt with.

These imperfectly treated products, getting into the blood stream, are carried to every tissue in the body, and, being detrimental to the health and vitality of every cell entering into the structure of the body, impair its vitality and produce definite changes.

The thyroid gland and other ductless glands endeavour to obviate as much as possible the harm done by these poisons, and enlarge and undergo definite changes, producing much trouble by altering the whole physiology of the body.

The organ that is most susceptible to poison, whether from heredity or occupation, changes more than the others, so that the attention of the

individual is focussed on it. In other words, it cries out louder than the rest of the body.

But no part suffers alone. Though one organ or tissue may suffer more than others, all suffer together, since they are every one supplied by the same harmful diet, and the drainage of structure is controlled in a corresponding manner.

AVOIDABLE ILLS

These changes are all described as diseases, but it is hardly necessary to point out that they are due to defective drainage in the first instance, and later to efforts on the part of important organs and tissues to meet this altered mechanical relationship to surroundings—in this case the blood. *All are avoidable.*

As is always the case, these efforts of the body to meet this altered mechanical relationship tend to shorten life. The vitality, and consequently the resisting powers of the cells to the invasion of organisms of all sorts, is lowered, and diseases, the worst of which is cancer, are able to obtain a foothold in proportion as the tissues of the organ are devitalised. Hence the profound importance of consulting a medical man at regular intervals, even when the individual believes he or she is in perfect health.

Let the medical profession have the opportunity it asks for—namely, to keep the nation in health, happiness, prosperity, and freedom from disease, and so help it to avoid the innumerable troubles and physical and moral misery that are inevitably associated with ill-health. This is a problem the public *must* face for themselves, and promptly.

HOW INFECTIONS BEGIN

If the public would guard against the poisons that rise from the cesspool of the body and the supplementary poisons that come from infected teeth, gums, and tonsils, they should safeguard themselves and those dear to them by consulting their doctors as soon as they recognise their earliest manifestations, and not delay, as is usually the case, until some harm or damage has been done which is irremediable.

Take such a simple examination as that of the teeth. The individual gets an infection of the gums, due invariably to a foul intestine, and the teeth have frequently to be pulled out in order to stay the process and to prevent serious harm such as, for instance, rheumatism, and possibly blood poisoning and death.

The great advantage to digestion and health afforded by strong, vigorous teeth is lost, and they have to be replaced by artificial substitutes which are not nearly so efficient.

This sequence could, of course, have been obviated if the doctor had been consulted long before, and the defective drainage scheme dealt with by appropriate diet.

When will the public exhibit a little intelligence in the treatment of their own bodies and give the medical profession a chance to restore our C 3 nation to an A 1, which it can readily do if afforded an opportunity?

THE PEEVISH CHILD

The earliest results of bad feeding and consequent constipation are manifested in infancy. The

child is unhappy and peevish and can only be soothed by a little alcohol or the use of that god-send to the poor, overworked parents, the "comforter."

Both these methods of alleviating the misery of the child and the discomfort of the parents have come in for much undeserved criticism. In any case they are very efficient for the purpose required.

The baby's abdomen becomes big and the chest correspondingly small. It develops hernia. Later, the miserable nourishment it obtains and the associated fouling of its blood are manifested in an obvious manner by thickening of all the bones and bending of some. This result of ignorance and neglect on the part of the parents is called *rickets*.

The neglect still continuing, the child develops large tonsils and adenoids, and very possibly he has trouble with his ears consequent upon this infection of his throat. Active surgical treatment may become urgently necessary, and, however efficient it is, the original source of the trouble is neglected.

Later the child complains of pains in the stomach, for which castor oil or some purgative is employed for relief. With some suddenness one of these attacks becomes serious, when it is recognised that the infection from the filthy, badly drained cesspool in its body has extended to the appendix. This has to be removed in order to safeguard the child's life.

WHOLESALE POISONING

The child may develop fixed deformities, as spinal curvature, knock-knee or flat-foot. For

these conditions the poor, ill-nourished muscles are stimulated by massage, electricity and so on, the source of poisoning being left to continue its deleterious influence on every tissue in the body.

The child gets a patch of inflammation of the lung, or an injury to a bone or joint, and the organism of tubercle finds a foothold and thrives vigorously in a soil whose resistance has been hopelessly depreciated.

As time goes on the adult complains of rheumatism, or suffers from rheumatoidal infection of the joints. The contents of the gall-bladder may become infected by organisms which extend up the duct of the liver from the fouled contents of the small intestine, and gall-stones form and bring all sorts of pain and risk to life.

The kidneys and bladder become infected by the foul organisms which have been collected from a dirty intestine, and have been carried by the blood stream to these organs in order to be excreted from the system. Changes then develop in the circulatory system, because organisms and toxins which produce either an excessive or a subnormal blood pressure have got into the circulation.

One might illustrate the results of neglect and ignorance indefinitely, but perhaps the most serious is that in which the tissues of important organs have been sufficiently degenerated by being supplied with blood contaminated with deadly poison ; and only then can the organism which is responsible for that dread disease, cancer, secure a foothold. Does not this afford the public material sufficient to think about and to take the necessary action to escape these avoidable calamities ?

CHAPTER IV

DISEASE AS A CRIME

IF it is generally recognised that by eating proper food and following normal physiological habits it is possible to avoid all the ill-health and disease so common among members of a civilised community, and to ensure health, vigour, a resistance to infectious diseases, and a happier life by obeying the laws of nature, it is obvious that those who persist in neglecting them are criminal wrongdoers.

Who has the right to inflict a poor physique, frequent maladies, absences from duty, incapacity to do good work, misery, illnesses, and early demise on relatives and on the public?

How many people call for the financial support of their relations and of the public for reasons that are entirely due to their gross ignorance and carelessness?

Have these people, because of their ignorance, stupidity, and neglect of their health, any right to bring into the world miserably degenerate specimens of humanity, when it is possible, by care and attention to diet and habits, that they can develop their physique and render themselves vigorous and healthy and fit persons to reproduce their species, and when they have produced them to be able to supply them with the good food that nature only can provide?

The sale of artificially produced infant foods is enormous and increasing. The innumerable illustrations of the results of such unnatural diet indicate too clearly the rapid and extensive degeneration which the physique of our women is undergoing, together with the necessarily associated low vitality of the male parent.

COCKTAILS AND LATE HOURS

Can anything be more detrimental to the infant in the early months of pregnancy than the habits of a large class of the young women of the present day? At the time when every drop of pure healthy blood is of vital importance to the little mite that is struggling to develop they are drinking cocktails and eating all kinds of utterly bad foods, unsuitable to their nutrition and that of their offspring. They are exhausting the energy which they should conserve, to develop the functions of their bodies and the growth of their infant, in dances and other amusements which keep them up late in close, stuffy, ill-ventilated rooms.

No man, and especially no woman, should undertake the very serious responsibility of bringing a child into the world unless the health of both parents is such as to justify them in doing so.

Maternity is a whole-time job, and the woman who does not take sufficient care of her health during the entire course of her pregnancy, and does not supply the child with the food it requires to ensure perfect health, is a degenerate, and compares most unfavourably with the native woman.

CRIMES AGAINST THE CHILD

With many women conscience is only too readily salved with the idea that their pleasures, or, as they prefer to put it, the claims society makes upon them, are paramount. A large number, moreover, are simply ignorant, stupid, and indifferent to their natural responsibilities.

For these reasons it is manifest that these people are wrongdoers, if they are not actually criminal. They produce children of poor physique, who suffer during the whole of their lifetime from neglect in the nursery, in the preparatory school, and in the public school, and later in life from eating the bad food and following the worse habits of civilisation.

The time has now arrived, in view of the steady and evident degeneration of our race, when some wholehearted endeavour should be made by every member of the community, male and female, to take an active share in restoring the vigour and health of the people, by dealing at once in a real and radical manner with the food and habits of people of all ages.

CHAPTER V

DRAINAGE AND HEALTH

MANY years ago that great organiser Dr. Simon Flexner, always on the lookout to secure men of superlative genius to plant in that hotbed of intellectual research, the Rockefeller Institute in New York, discovered one in Chicago. He was a French medical man who was educated in Lyons and later drifted into the research laboratory of Dr. Carl Beck, a very eminent surgeon in Chicago. Dr. Carl Beck had always paid great attention to the laboratory aspect of his profession and managed to secure for it very able men.

The name of the French surgeon was Dr. Alexis Carrel. Entering that institute—the most generous gift of the American oil king—Dr. Carrel employed his wonderful dexterity and manipulative skill in performing such extraordinary operations as exchanging the legs of dogs and carrying out many experiments which were of the greatest use to surgery.

GROWING LIVING TISSUES

He then determined to attempt to grow living tissues, and three years before the war he was able to grow various tissues of the body upon microscope slides. These were kept at a suitable temperature, were fed daily with some juice from a living organ, and were washed daily to remove

the products of digestion by the cells of the tissue of the food material which was administered to them.

Treated in this manner the tissues grew and thrived, the cells multiplying and the material increasing steadily in bulk.

He found that if the drainage of the products of the digestion of the body juice by the cells was not effected at sufficiently short intervals the cells became wanting in vitality and in size. If the interval was sufficiently long the cells shrank and died.

This impressed him with the vital importance of drainage in the case of the several tissues of the body. The specimens which were thriving before the war are still growing, and as far as it is possible to see will continue to grow and thrive for ever, presuming their diet and drainage are attended to with regularity. For this and his other work Dr. Alexis Carrel received the Nobel prize, which his labours richly deserved.

While his earlier work was most interesting and useful to the medical profession, these successful experiments in the mode of growth of living tissues have thrown a flood of light upon our methods of treatment, since they have demonstrated in the clearest possible manner the enormous and vital part which the drainage of the products of digestion, not only of the several cells which compose every organ in the body but also of the body as a whole, plays in the preservation of health and in the duration of life.

Let us apply this most important knowledge to our daily lives. Two thousand years ago Hippocrates, the Father of Medicine, the great pioneer

of the New Health Society, regarded it as the most important function of the doctor that he should instruct the people in the laws of health. This duty he considered as absolutely essential and one far transcending all attempts to alleviate suffering and disease.

THE TWO MAIN FACTORS

He talked freely to the Greeks, explaining to them the infinite importance of diet in relation to health and insisting on the associated necessary evacuation of the products of digestion. These two factors, the input and the output, he showed, bore a definite relation to one another and were of equal importance, being indeed inseparable.

Two thousand years ago he recognised, without the aid of the microscope and without the various scientific means at Alexis Carrel's disposal, the fundamental importance of this subject to the vitality, stature, health, and freedom from disease of the community.

He pointed out that man differed in no way from any other animal living in a state of Nature, and that any departure from the habits of life in either man or any other animal as the result of civilisation ended sooner or later in disaster.

For a certain period in the life of the infant, provided that the child is supplied with the breast milk of a healthy, vigorous mother, each feed is followed by a reflex passage of the contents along the several portions of the gastro-intestinal tract, the terminal portion being evacuated. This condition, which is normal and physiological, occurs throughout the entire life of savages living in

normal surroundings, just as it does in all animals in the same circumstances.

After a short period in civilisation a change is made in the habit of the infant, since the mother insists that the normal sequence as regards drainage shall be most materially altered, the input of meals remaining as before. She insists that the regular reflex sequence shall be replaced by a single evacuation of the products of digestion, and this at a certain specified time of the day.

The result of this over-distension of the end of the larger bowel is that, first, extensive changes take place in that portion, producing obstructive changes and the damming up of material of a poisonous nature in the bowel proximal to the obstruction. Following on the mechanical changes is an infection of the food supply contained in the child's intestine by the invasion of organisms from the foul contents of the large bowel or cesspool.

DAMAGE TO CHILDHOOD

The earlier in life these unnatural and practically criminal changes enforced upon the unfortunate helpless infant take place the greater is the damage sustained, since new formation develops in young life in an inverse proportion to the age of the infant.

The result of this interference is that changes arise which are the direct and indirect causes of all the depreciation, misery, and disease of civilisation, a condition from which savages are fortunately permitted to escape, not being contaminated by the food and habits of civilisation.

Take these same savages and inflict on them the

diet and habits of civilisation and in that proportion you deteriorate them and render them unhealthy and exposed to all the diseases which affect us and from which they were perfectly free.

CHAPTER VI

SELF-POISONING

It is exceedingly important that the changes that take place in the food supply, because of any interference with what is the normal process of cleansing the bowels, shall be perfectly understood.

By normal is meant the emptying of a portion of the contents of the large intestine after each meal, and in a degree proportional to the amount and character of the food taken at each meal. This takes place habitually with natives living in their normal surroundings, and is modified only in civilisation, with most serious detriment to the physique and health of the individual and increased liability to infection.

As indicated very clearly before, this interference with the normal function of the body, practically universal with us, is responsible for endless misery, ill-health, and disease. The teaching of these truths, so strongly insisted upon by that great pioneer of New Health, Hippocrates, is habitually ignored by the general members of the medical profession.

I am indebted to a medical colleague for supplying me with the following dissertation on the flora of the intestine. A careful study of it will supply the reader with much useful food for thought.

MILLIONS OF GERMS

Certain parts of the intestines teem with low forms of vegetable life, known as bacteria or germs. These plants are of many varieties : some are round balls, others form short rods and branched sticks. They are very minute, and a drop of water can hold a million of them without appearing even faintly milky.

They are continually growing and dividing. If furnished with suitable food, each fragment reaches maturity and is ready to split again in a very short space of time, an hour or even less. Some thrive on one kind of food, some on another.

Some of the most harmful ones, which are called the *streptococci*, have a great appetite for sugar, and their rate of multiplication is increased enormously under the influence of sugar. If waste products could be removed and fresh glucose broth supplied without limit, a single coccus could in three days' time give rise to progeny weighing a billion times a billion tons, and capable of destroying the entire sugar supply of the world in the fraction of a second.

It is of the very greatest moment that our food supply should be kept safe from the ravages of such greedy pests during the processes of digestion and assimilation. The human digestive tract is of considerable length. The upper 24 feet are germ-free and devoted to the liquefaction and absorption of food. The lower few feet constitute the colon or big bowel, and serve as a reservoir for the accommodation of undigested residues, until such time as they can be evacuated.

This part is positively alive with bacteria, but

provided that all the nutritive parts of the food have been absorbed into the system by the sterile upper bowel, these bacteria have no opportunity of doing harm. They have to subsist on vegetable fibre and similar remnants from which they cannot manufacture any very poisonous substances.

The real trouble arises when conditions are so altered that the germs come into contact with rich food. This undesirable mixing of bacteria and food is facilitated by two different habits.

In the first place, if the colon, which is the cesspool of the digestive system, is not evacuated regularly and effectively there is an upward seepage and the germs penetrate, or are washed upwards to, the higher levels where food is still in the process of digestion.

The second way of contaminating the food after its consumption is by eating unwisely. Some foods are digested more quickly than others. If we choose foods so prepared that twice the normal length of time is required for their liquefaction and absorption, some of the food is sure to travel downwards as far as the germ-laden colon before the body can get it out of the way into the tissues. Food and bacteria then meet and putrefaction occurs.

Bacteria nourished in this way with food meant for our own exclusive use do an immense amount of harm. They decompose the food, making poisons and gas, the effect of which is very much like that of eating stale, putrescent food.

DEADLIER THAN STRYCHNINE

Many of them also produce poisons which they throw off into the surrounding tissues. These

complex synthetic bodies are usually called *toxins*. They are far more lethal than the better-known non-bacterial or chemical poisons, such as arsenic and strychnine.

Some bacteria fostered in the bowel by stagnation and indiscreet feeding actually force their way through the bowel wall and, leaving the food and intestinal pulp, work their way into the very substance of the body itself. Once established in this new situation they are very difficult to dislodge. The blood stream, which courses round the body at considerable pace and pressure, quickly spreads them and their toxins to every part, setting up troubles of the most devastating kinds.

These difficulties can be avoided if the bowel is allowed to act more than once a day and if the indigestible elements of the diet are represented exclusively by cellulose and fine vegetable fibre, such as that of fruits, vegetables, and crude cereals.

CHAPTER VII

THE HUMAN ENGINE

REALISING the immense importance of rendering the general public thoroughly familiar with the manner in which the human body performs its apparently very complicated function, Professor Plimmer has at my request furnished the following very practical and illustrative description of the mechanism of the human engine.

The very simple and figurative language in which he clothes his account will appeal to every one. Judging from the innumerable requests that have reached the New Health Society to supply articles in simple language, all recognise how essential it is that the description of the manner in which diet plays its profoundly vital part should be so plain as to be intelligible to every reader.

By PROFESSOR R. H. A. PLIMMER, D.Sc.*

Food is wanted to keep the body going. The body is something like a locomotive engine. It requires fuel, it requires running repairs, and it requires lubricating oil to keep the moving parts in proper order. There are many points of resemblance, and certain differences.

Firstly, the whole body is warm and has to be

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kept warm. Secondly, though the body may be asleep and at rest, certain organs, like the heart and respiratory muscles, are constantly at work. These activities use up fuel. An engine stops completely and requires no fuel when at rest.

To make the engine move fuel must be burned ; the faster and farther it goes the more fuel it needs. The same is true for the body. Both want repair ; the engine is stopped for repairs ; but the body is repaired continuously whether at rest or at work.

THE REAL FUEL

So the body is more complicated than the engine. Food is both fuel and repair material, and in growing animals it is also the building material from which increase in size comes. The carbohydrates (*i.e.*, starch and sugar) and the fats are the real fuel ; the carbohydrates for quick use and the fats for slower use.

Proteins (in lean meat, fish, cheese, egg, milk) are repair material and building material for growth. Protein also serves as fuel ; in fact the greater part of it is used as fuel and only a little for repair and growth.

To keep an engine running properly lubricating oil is required, as well as fuel. Every moving part needs a continuous small supply of oil. The vitamins may be compared with the lubricating oil. Different parts of the engine want different kinds of oil, thick, medium, or thin. If a part does not get oiled, it "seizes." In the same way the body wants different vitamins for different parts. The blood vessels want vitamin C, the nerves and muscles want vitamin B, the bones

want vitamin D, while for the growth and general repair vitamin A is needed. So the body simply wants a greater variety, as it is more complicated than any machine.

ANOTHER NEED

The body has one other need which the engine has not got, that is for mineral matter. Part of the mineral matter is for repair and part for growth. Iron is the mineral wanted to make the red blood pigment ; lime and phosphates are wanted for the bones and teeth.

Other minerals are wanted to dissolve in the water to form the proper medium for the working of the heart and other organs. The medium may be compared with that required for the conduction of electricity ; pure water will not conduct an electric current, but very small quantities of mineral salts dissolved in it make it an excellent conductor.

The starches, sugars, and fat are the fuel. The fish, flesh, fowl, eggs, cheese and milk are largely fuel and also contain the repair material protein. The mineral salts act as repair material and conducting fluid, and the vitamins act as lubricating oils.

The bulk of the food is for fuel and repair ; the vitamins apparently take no part in this process, but ensure the healthy working of all the parts. Like lubricants, vitamins are wanted continuously and a little at a time. So they should be taken whenever food is eaten, and not in occasional doses ; no engine-driver oils his engine once a day or once a week, but sees that the engine is oiled all the time.

CHAPTER VIII

THE REAL FUNCTIONS OF FOOD

FOR our present purpose we may class together meat, fish, fowl, and game. These foods are the most popular of foodstuffs in Western countries and form the basis of the general dietary.

Butcher's meat differs from fish and fowl only in its somewhat higher nutritive value, bulk for bulk, and owing to its higher content of fat is rather less easy of digestion.

The consumption of meat by all classes of the community has increased very considerably in the last fifty years, and while this article of food is condemned *in toto* by some dietetic enthusiasts, it is overvalued by the majority.

Seeing that we are face to face with an unsatisfactory condition of health and physique in the general community, which is undoubtedly based on faulty habits of diet, it will be useful to try to arrive at a just estimate of the rightful place which meat should occupy in a diet best calculated to promote health, long life, and efficiency.

We may roughly divide up foods into two main categories—those which supply the cell-engines of the body with fuel for the provision of heat and energy, and those which build and repair the tissues of the body.

The former class includes the starchy foods, sugars, and fats. Our concern now is not with

them but with the building and repair foods, of which meat is the most widely used.

REPAIRING THE DAILY DAMAGE

A constant supply of suitable building material is necessary, not only during the years of growth, but throughout life, to make good the constant breaking down which is for ever going on in all the tissues of the body.

This breaking-down process goes on at the same rate in all normal individuals irrespective of the activity they exhibit. The clerk who spends his day in the office requires no less new building material than the navvy, and the athlete requires no more than the sluggard. This is contrary to the generally accepted idea among the laity.

On the other hand, greater activity of the body calls for an increased supply of the fuel foods to meet the increased expenditure of energy. We must, however, realise that building foods such as meat can and do serve as fuel to some extent, and especially the more fatty kinds of meat. Some fuel foods also provide adequate building material.

It is nevertheless grossly extravagant and harmful to use a *building* food such as meat as a *fuel* substance for the production of energy. The building material contained in the *fuel* foods is, generally speaking, not so good for some of the bodily requirements as that of the special *building* foods.

Various kinds of material are required for different structures in the body. That needed in greatest amount is known as *protein* substance. There are various kinds of protein, varying in quality and usefulness. The best kind is con-

tained in meat, fish, fowl, eggs, and milk. It is very necessary to health that our bodies should be provided with a definite quantity of this best kind of protein-building substance daily.

This quantity, in the light of modern research, is nothing like so great as scientists used to deem necessary. This applies also to the inferior types of protein, which are supplied by foods like peas, beans, cereals, nuts, and other foods.

Of the total amount of protein for the day's ration about one-third should be first-class, and two-thirds of a less good quality. The foods supplying first-class protein are expensive foods, compared with those which supply an inferior type.

THE BEST DIET

There is very little danger of one not getting enough protein from a good mixed diet. Most people eat too much of it. This applies principally to the well-to-do classes, who consume an excessive amount of meat foods.

The body has no arrangements for storing protein foods in excess of its requirements. Any excess has to be got rid of by the liver and kidneys, and these long-suffering organs become overworked and damaged.

Flesh foods, eggs, and most kinds of ripe cheese rapidly undergo putrefactive changes. This is familiar to every one, as it occurs in the larder. Similar changes occur in them within the bowels, and excessive consumption of these foods leads to excessive putrefaction of the contents of the bowel, and thus to serious infection and contamination of the nutritive fluids of the body.

Cheese and eggs provide a very concentrated protein substance of first-class quality, and if they are used with moderation (say, two eggs or two ounces of cheese) provide a good substitute for a generous helping of meat. The simple home-made cottage cheese and the cream cheese are cleaner foods from the point of view of putrefaction within the bowel than the ripe cheddar, stilton, or gorgonzola. Milk and cheese provide just as good protein as the flesh foods. Hence these dairy products should be more extensively used in place of much of the flesh food now consumed.

It is generally accepted by dietetic authorities that a diet of cereals, fruits, and vegetables, supplemented by a liberal allowance of milk (one to one and a half pints) with a little cheese and a few eggs, is the most satisfactory one that man can adopt.

MEAT NOT ESSENTIAL

We have to recognise a widely popular belief that a man cannot be strong or do a good day's work without meat. There is no scientific basis for this belief, and there is abundant evidence to the contrary. It is a belief based on tradition and misconception of the properties of meat. It is a belief so firmly established, however, that it is unlikely that man will ever abandon it.

There is no physiological reason why he should, provided that the public are educated to estimate it at its proper value, use it for its proper purpose, and are also taught to consume more freely that excellent substitute, milk, which, while possessing equal virtue, is free from some of its drawbacks.

A safe practical rule is to use flesh foods only at one meal in the day. If this is found difficult or impracticable, the meat and fish allowance for the day, which should be roughly 4 or 5 oz. of meat or 6 to 8 oz. of fish, should be carefully divided between two of the principal meals.

These foods should never be used as "filling" foods—this is the office of cereals and vegetables. They are more likely to be harmful to the constipated and, contrary to general belief, to those in indifferent health. The young and vigorous can use them more freely, but even for the young they are not a physiological necessity.

There is a school house for boys of nine to eighteen years of age, well known to the writer, where flesh foods are never on the table, but where milk, fruit, salads, nuts, and potatoes and wholemeal bread are provided very liberally. The boys are in magnificent condition, and are even superior in achievement in work and sport to those of other houses in the same school where meat is provided daily. Such evidence is conclusive and could be multiplied indefinitely.

CHAPTER IX

THE STUDY OF DIET

MORE interest is being taken in the subject of nutrition every year, as is shown by the frequent publication in the daily press of information about what we shall eat.

We are constantly told that we eat too much, and that we do not choose the right kinds of food. The discoveries during the past twenty years of the elusive "vitamins" have opened up new vistas, and the general public have become fascinated by the curious intricacy of the presence or absence of the several vitamins in the various foodstuffs.

A haphazard choice of food may mean the omission of some health-giving substance. Individual likes and dislikes are not a reliable guide as to which foods to eat and which to avoid. The proper choice of food cannot be made without a little special knowledge. Hence the justification for health education.

NEED FOR HEALTH EDUCATION

Manufactured, over-refined, and preserved foods have led the people away during the last fifty years from the fresh and natural foods which are the basis of good health. No reader need be afraid that the teaching necessary to counteract this evil of our civilisation is beyond the under-

standing of the layman. The right foods, which will be detailed later, must contain the three vitamins A, B, and C, also certain mineral salts and the good types of protein.

If dietary is to be satisfactory it must include many kinds of food material. In other words *balanced* meals are essential. What we require is "a square meal," as set out in the accompanying diagram prepared by an eminent food expert in a great London hospital. Further particulars must be reserved for a special chapter.

Much more about foods and their effects upon growth and health has still to be found out. How is the subject dealt with at our universities and medical schools? At present the subject of nutrition comes within the province both of the physiologist and the biochemist. Only a few of these teachers are really interested in the modern aspects of the subject.

BUTTER FOOD.	BREAD FOOD.
FRESH FRUIT AND VEGETABLES.	MEAT FOODS.

"A Square Meal"

As far as the medical student is concerned there is no special training in dietetics beyond the

few lectures he receives from teachers of other subjects. As a consequence we often find nowadays that the layman knows more about foods than the medical practitioner. The latter, in spite of his ignorance, gaily prescribes curious diets for which he can give no more adequate reason than that they are the usual custom.

Why is boiled white fish with white sauce and white rice pudding such a common diet in our nursing homes and in convalescence? All these foods are grouped among those we ought not to eat by the expert workers on nutrition.

It is high time that alteration be made. Much more thought, time, and endeavour are given to the feeding of animals. There are two large animal nutrition stations in this country, but there is no chair of nutrition in any university or medical school. The feeding of man is just as important as the feeding of animals.

BRITAIN'S BACKWARDNESS

The universities have not at present the funds for departments of nutrition, so a founder of a chair of dietetics or nutrition is awaited. In the United States there are several university departments devoted to food and nutrition, as well as numerous agricultural stations in which animal nutrition is specially studied. We ought to have at least one university chair of nutrition.*

* As a direct result of the publication of these articles in the *Daily Mail*, a woman reader (who prefers to remain anonymous) made a gift of £10,000 to the University of London, towards the establishment of a chair of dietetics. A well-known firm of food manufacturers gave a further £10,000, and, at the time of writing, the completion of the total of £35,000 required for the full equipment of a department of dietetics is confidently awaited.

Other countries see the importance of it and start special departments to follow it up and advance it. We cannot be expected to keep pace with other countries if our pioneers can give only part time to the subject. It would be an honour to them if their subject were raised to the full status of a separate department.

Food, or rather the right food, is of such concern to the general public that it is a wonder that they have not clamoured before now for many departments where nutrition could be studied for itself. The public want full information about every food we eat and its effect upon the body. It cannot be got without special departments devoted to the teaching of food values and research upon every article of food.

CHAPTER X

NEED FOR CHAIR OF DIETETICS

PERHAPS the thing that amazes the recently qualified practitioner most when he starts in practice is the very scanty information on the subject of diet which he received from his teachers during his whole career as a student.

The student spends an endless number of weary hours endeavouring to instil into his brain a knowledge of the contents of the British Pharmacopœia, trying to remember the source and the manner of preparation of a large number of drugs which he has to recognise and with whose qualities he is expected to be familiar when faced by examiners in this subject.

He is bitterly disappointed, however, when he starts treating patients and finds that the vast bulk of the knowledge of drugs which he has acquired with so much difficulty and so expensively is of little use to him in his work, that quite an insignificant number of medicines are sufficient for his requirements, and that a knowledge of the relation of diet to habits and to health, on which subject his patients expect him to speak definitely and with authority, is woefully absent.

This too frequently results in his becoming a law unto himself, and in his individualistic way he usually prescribes such foods as he thinks will be appreciated and which he probably eats himself.

NO SPECIAL TRAINING

It is an extraordinary fact that in Great Britain, where such wonderful pioneer work has been done and such great progress in dietetics has been made by Sir F. Gowland Hopkins and a number of other distinguished men, the knowledge of food values, by far the most educational factor in the career of the doctor, is represented by no chair at any of the universities, and that no expert dietitian or special course is allotted to the teaching staffs of any medical school to instruct the student. He has to depend on the very different and frequently contradictory instructions on diet afforded by the physicians and surgeons with whom he worked.

Looking back on his student training, he recalls that his practical knowledge of dietetics was limited not infrequently to the casual observation of the diet supplied to the patients in the hospital, and to the fact that it did not seem to be in accordance with the teaching of such experts as McCollum, whose works he studies later.

He soon learns that almost all the diseases which he is called upon to treat are due chiefly to errors in diet and to bad habits consequent upon them, and that a large part of his treating must consist in so balancing the diet of the patient that he shall be properly nourished and that his intestines shall be made to function normally without the administration of purgatives.

HARMFUL PURGATIVES

Purgatives are so powerfully irritating that a minute quantity as large as the head of a pin is capable of so annoying and upsetting the

machinery of the whole length of the intestinal tract as to cause it to evacuate some of its contents in what is obviously an unnatural and deleterious manner.

That purgatives are very largely responsible, directly and indirectly, for cancer is undoubted. The medical man soon realises that by eating wholemeal or rye bread, dairy produce, fruits and salads, and performing suitable abdominal exercises, unless the large bowel or cesspool has become seriously obstructed, the system will function in a normal manner and health will be restored to the sufferer.

DOCTORS' IGNORANCE OF DIETETICS

Is it possible to afford the public better evidence of the sublime ignorance of very many members of the medical profession on the subject of food values, and of the important part diet plays in their capacity to look after the health of the public, than that supplied by the answers to the bread ballot of the Millers' Association just published? It is almost impossible to realise the apathy and ignorance manifested by them.

To quote the report as follows :

" Analysis of the figures shows that 89 per cent. of the doctors who replied to the question actually eat white bread ; 76.6 per cent. of those who definitely answered the question repudiated the statement of the president of the New Health Society (namely, that

' the curse of our age is that we are provided with white bread ')

and a further 10.1 per cent. regarded it as misleading ; while over 80 per cent. considered white

bread a good and nutritious food in a mixed diet, and did not agree that in such circumstances it was likely to lower the standard of national health."

As opposed to these quite unscientific opinions held by these medical men we have the accumulated intelligence of those who have made dietetics a life-long study: Sir F. Gowland Hopkins, Professor Plimmer, Dr. Hindhede, Professor E. V. McCollum, Colonel McCarrison, Dr. Kellogg, Dr. Rosedale and many others.

The Ministry of Health reports, the *British Medical Journal*, and an incalculable number of observers, have shown the utter insufficiency of white bread to support life, while on the other hand they assert that wholemeal bread is a complete food.

In support of a trade whose present interests obviously are detrimental to the public, such an attempt to confuse the mind of the country appears to be almost criminal.

Many important millers and bakers have recognised the rapidly increasing demand of the public for wholemeal bread, a demand which is increasing by leaps and bounds, and in proportion as the aims and objects of the New Health Society are being adopted.

It is to the lasting credit of the *Daily Mail* that it initiated these reforms in 1910, and is carrying them to a triumphant issue in 1927, when the later discoveries of science have confirmed all the efforts of that great educational daily.

LEARN MORE ABOUT FOODS

The Americans have founded a chair of dietetics in Johns Hopkins University at Baltimore, which

is held by Dr. E. V. McCollum ; another in Columbia University, New York, whose professor of food chemistry is Dr. H. C. Sherman, and there is a very important food investigation bureau in Washington.

Other centres for the study of nutrition exist there, perhaps the most important of which is in Wisconsin, where Dr. Steenback is doing excellent work on the A and D vitamins. In this country we have no university chair for the study of nutrition, yet surely the medical students in our hospitals and schools have the same right to be supplied with the knowledge so essential to them in the proper performance of their duties as medical men, as have the students in Canada and the United States.

That this is a crying need must be apparent to the members of the general public. The work required is not intended to criticise the excellent teaching in our medical schools, but to supplement and perfect it. This requirement must be met without delay.

In Great Britain there are two research stations dealing solely with the investigation of the feeding of large animals, one in Cambridge and one in Aberdeen. In fact, *the pioneer work on vitamins was done in this country*. The general principle of an accessory food factor, or vitamin, was firmly established by scientific experiment in 1912 by Professor Sir F. Gowland Hopkins, the most distinguished living bio-chemist. The fact that B vitamin is a material substance was first shown by British subjects working as researchers in the Public Health Department in the Federated Malay States. And the work done by Drs. Frazer and

Stanton has just been recognised by the award to Dr. Stanton of the Bissel Medal by the Royal College of Physicians.

The bio-chemists are endeavouring to extract definite substances, or vitamins, which are known now only by their effect on health and are demonstrated by the diseases which arise when certain substances are separated from the food.

About a year ago Professor Drummond at last succeeded in isolating the elusive vitamin A, but with the care and accuracy which characterises British science the observer would not commit himself to a positive statement.

It is almost impossible for the layman to realise the difficult and laborious work entailed in the attempt to separate a vitamin as an actual substance, made all the more difficult by the fact that the vitamin is so readily destroyed in the process, which means beginning again.

Though the actual vitamin has not yet been prepared in a pure form, most potent extracts are now easily obtained, and the characteristic properties of each can be recognised. The day cannot be far distant when the vitamin will be shown as a definite entity. But as far as the health of the people is concerned the final isolation of the vitamin is not essential. They have only to eat those foods which contain them, and to avoid those from which they are absent, or are present in an amount insufficient for the preservation of health.

Our dietitians have described in the clearest manner possible the actions of the several vitamins now recognised, together with their distribution in the foods which are so readily accessible to the

public and so absolutely essential to health. Therefore there is no reason why the members of the community should not keep their bodies healthy by comprising in their dietary just such foods as go to form a square meal.

CHAPTER XI

RIGHT FOODS PREVENT DISEASE

A SOUND body cannot be built up from poor material.

The right kinds of food produce good health and resistance to infection. The wrong kinds of food make for ill-health and lowered resistance to infection.

Many of the ills of civilisation are due to wrong habits of feeding. Among these are indigestion, constipation, appendicitis, and rickets. Even the widespread diseases of tuberculosis, diabetes, and cancer are certainly connected with a faulty diet.

The right kinds of food supply not only warmth and energy, but everything that the body needs, for its growth and maintenance. The foods in common use are largely the wrong ones. This is not to say that they contain any harmful substance. But they are lacking in the special materials which the body needs, so that it falls into a state of disrepair and gradually fails.

Every year as we approach the winter months the need for vitamins becomes greater as our diet undergoes the seasonal change. Owing to the rise in the price of milk and eggs, and the smaller choice of vegetables and fruits, it becomes of more importance to see that we are eating enough of those foods which contain the vitamins.

FRUITS THAT PREVENT SCURVY

In one respect we may consider ourselves better off in the winter than in the summer. Supplies of oranges gradually become plentiful, and oranges are better in flavour and quality. Fresh fruits supply vitamin C (the anti-scurvy factor), and with an orange a day we become safe from incipient scurvy, a disease which played havoc in the winter months with our people in former days.

Our consumption of vitamin A (which helps us to fight off disease germs) is derived mainly from milk, butter, eggs, and animal fat. We substitute margarine for butter and take fewer eggs and less milk. But unless the restriction in consumption of these articles is very great we need not fear any trouble arising from lack of vitamin A.

The position is different with vitamin B (which helps the nerves to function properly). The quantity taken in the general articles of food is always likely to be on the short side. Vitamin B is essentially in the seeds of plants. No one can eat more than a small quantity daily of nuts, or haricot beans, or dried peas.

As the colder weather naturally leads to a higher food consumption, the increase is derived from bread, flour, and sugar. The bread and flour are usually white and, like the sugar, contain no vitamin B. We should turn to wholemeal flour and bread, if we wish to eat a proper quantity of vitamin B. It is difficult to find any other way of getting our daily need of vitamin B.

DIGESTIVE TROUBLES

We can, however, easily make up for any shortage by taking daily a small quantity of a food rich in this vitamin, such as *Marmite*, a palatable form of yeast extract. A daily quantity of $\frac{1}{8}$ oz. to $\frac{1}{4}$ oz. in the daily diet, which amounts to about 24 oz. dry weight of food, is very suitable. In the winter it is pleasant to have this in the form of a cup of hot soup.

The importance of vitamin B in the diet is not sufficiently recognised. Absence of vitamin B, or a very small quantity of it, gives rise to the Eastern disease called beri-beri. Too little vitamin B, or what is called a shortage, does not usually lead to the beri-beri symptoms but rather to various forms of digestive troubles, the most prominent of which are constipation and dyspepsia.

Then the shortage may lead to indigestion, to various complications, as acute and chronic appendicitis, or to enlargement of the heart. These are such common symptoms nowadays that the insufficiency of vitamin B in the diet, which is such a common error if we carefully examine the food consumption, appears to be the underlying cause.

We look to the several business organisations concerned to supply the public with the all-important fruits and green vegetables at reasonable prices, and thus to take a philanthropic interest in cheapening the people's food and so improving their health and efficiency and reducing ill-health and disease.

THE MOST VALUABLE FOODS.*

VITAMIN A. (RESISTANCE TO DISEASE.)	VITAMIN B. (NERVE TONIC.)	VITAMIN C. (ANTI-SCURVY.)
Cod Liver Oil.*****	Cereals, comprising the whole Grain.	Oranges.
Roe of Fish. } ****	Dried Seeds, such as Peas, Beans and Lentils. } **	Lemons. } ****
Butter. } ****	Nuts. } **	Grape-Fruit. } ****
Egg Yolk. } ****	Egg Yolk. } **	Tangerine. } ****
Mutton and Beef Fat. } **	Internal Organs (Hearts, Livers, etc.). }	Tomatoes. } ****
Milk. } **	Oatmeal. }	Raw Greens. }
Fatty Fish. } **	Root Vegetables. } *	Raw Swedes. }
Greens. }	Milk. }	Raw Carrots. }
Carrots. }	Yeast. } ***	Raw Liver. } **
Tomatoes. }		Raspberries. }
Margarine (if Animal Fat). }		Blackberries. }
Wholemeal Flour. }		Peaches. }
		Most other Fruits. }
		Greens cooked short time without soda. }
		Boiled Potatoes. }
		Raw Milk. }
		Liver cooked short time. }

*—Contains some Vitamin. **—Contains more Vitamin.
 ***—Rich in Vitamins.

* From "Facts about Food," by Prof. R. H. A. Plimmer and Violet G. Plimmer (Longmans, Green & Co.), 2/-. Cloth, 3/6.

CHAPTER XII

A MUCH-NEEDED REFORM

BECAUSE of the innumerable complaints that have reached the New Health Society of the gross inadequacy of the sanitary arrangements in schools, business premises, railways, and so on, it would seem necessary to explain and stress the very great importance of meeting this glaring weakness in our state of civilisation.

In a previous chapter attention was called to the vital and far-reaching importance of the experimental research made by Dr. Carrel in the Rockefeller Institute in 1911, when he showed, by growing living tissues on a microscope slide, that *there is no such thing as death of a tissue provided it is nourished and drained at regular intervals.*

The public should realise that every single cell in the body goes through precisely the same cycle as does the entire body in the process of nutrition and digestion and evacuation of the products of digestion.

Just as the products of digestion in a single cell must be removed at regular intervals in order to ensure its vitality and growth, and indeed its life in perpetuity, so the more thoroughly and regularly drainage of the digestive system of the whole body is effected the healthier it will be and the longer will the life of the individual be lived in comfort.

The vital importance of attention to the regular,

systematic evacuation of the bowel has already been urged most strongly on the public in this book, and especially on parents. It is presumed that parents, now realising this, have most carefully, with their doctor's aid, considered their own diet and habits, and have thoroughly investigated the diet and habits of their children. They should also have found out exactly what lavatory accommodation is supplied at their boarding schools, what time is allotted for this most important physiological function, and also what instruction is given to the pupils on this vital subject.

A GENERAL COMPLAINT

It is not in schools alone that there is an inadequate lavatory provision, and this is particularly true as regards the accommodation for women. The New Health Society has been inundated with letters from correspondents in which bitter complaints are made by women shoppers, by the male and female employees in shops, and by the public generally, of the great discomfort, mental depression, and illness which result from the present very serious deficiency of lavatory accommodation.

At restaurants especially, and at theatres, the lavatory accommodation for women is often most inadequate and often hopelessly dirty, insanitary, and even disgusting.

Surely the question of sanitation in commercial establishments should come under the control of the medical officer of health, since nothing can be more deleterious to the health and well-being of the people than present conditions of defective sanitation. All the correspondents are loud in their praise of the magnificent efforts which the

Daily Mail has made to improve the health and happiness of the community, and by so doing to prevent disease and prolong life in comfort.

AN ESSENTIAL TO HEALTH

While innumerable complaints have been made, many speak very highly of the lavatory arrangements and accommodation for women in the establishments under the management of certain well-known firms, who set a magnificent example in their determination to make their employees and their clients as comfortable, healthy, and happy as possible.

It is impossible for the present conditions of diet, sanitation, and exercise in our schools to continue as they are at present. Where the food and sanitation of the schools have been rendered sufficient we shall have much less of the frequent outbreak of maladies of all sorts and shall have fewer complaints from parents.

The brains of the youth of the country, being fed with blood uncontaminated by poisons absorbed from an intestine whose contents are foul and stagnant, will react to the efforts of the educationist to the greatest advantage, a matter of the highest importance in the present battle of life.

Some optimists are in the habit of stating that our race is improving physically, that we never were better. That this is absolutely false, and that the reverse is true can be demonstrated in the clearest manner possible by a comparison of the published description of the physique and teeth of the soldiers of Wellington and their wives, who were exposed to constant hardship, with our

soldiers of the present day living in comparative luxury.

Mothers complain that their children go away to school with nice rosy cheeks and in excellent health, and that they are sent back to them with dirty tongues and skins frequently covered with spots, and complaining of indigestion, which is clearly the result of constipation and improper diet.

Surely it is time that the sanitary arrangements of the schools were brought up to date, that sufficient times were allotted to the performance of the necessary functions of the body, and that some care be devoted by the medical authorities to determining the correct diet, and the instruction in that part of the children's physiology the functioning of which is so absolutely essential to health.

The Food Committee of the New Health Society has compiled a diet for school children that will contain all the foods which are necessary to promote growth and vigour, and which will not entail an expenditure greater than that which exists at present. This valuable information is now available in its complete form in a separate publication of the same Society.*

DISCOMFORT AND ILLNESS

As regards employees, it is painful to learn of the serious discomfort, and indeed distress and illness, to which they are exposed, because of the deficiency of the necessary sanitary arrangements.

* *Food Book No. 1.* Price 8d., post free, New Health Society, 39, Bedford Square, London, W.C. 1.

It would seem to be a part of the duty of the Ministry of Health officials to investigate this most serious grievance, which is really intolerable.

Travellers by train also insist on the very insufficient amount of the necessary conveniences on trains which run quite a long distance. While many of the complaints come from women, quite a number are from men. It would appear that the requirements of women have not received the same consideration as have those of men.

All join in praising the *Daily Mail* for the very open way in which this trouble has been ventilated in the paper, and for the determination that journal has shown in remedying abuses, in calling attention to the kinds of food most useful, and usually cheapest, for the people, and in insisting on the vital importance of devoting every possible care to the normal functioning of the body.

It is generally felt that, when more attention has been paid to the education of the medical profession in that most important and far-reaching subject of dietetics, this glaring defect in our civilisation will be dealt with efficiently.

BACK TO NATURE

The public has begun to realise for the first time the fact that the input of food into the stomach must be followed automatically by a corresponding emptying of the large bowel, and that the habits of civilisation must be restored to those which exist universally in Nature.

Only in this way will the general health, physique, and freedom from disease be restored to the normal.

While the vital importance of this was impressed on the Greeks by that greatest pioneer of the New Health Society, Hippocrates, it has practically been ignored for generations by the medical profession, with the result that our people are degenerate and are still rapidly degenerating.

A CRYING NEED OF SCHOOL LIFE

It has been pointed out that, owing to the supreme ignorance of parents, the sequence of reflexes in the intestinal canal, following the ingestion of food into the stomach, was abruptly altered early in life, in that, while the import of food continued to take place in three or more occasions during the day, the output of the waste products of digestion was controlled for twenty-four hours, with disastrous results to the health of the individual. While this matter of only a single output may receive some attention from the parent or nurse in earlier life, even this very imperfect compromise may be very materially modified during the school life of the individual.

Quite apart from the very important subject of diet, upon whose nature the performance of the function of the stomach and intestine depends, the lavatory arrangements in nearly all private and public schools are lamentably defective. In some institutions the conditions are so insufficient as to amount to criminal neglect.

This is not the case in such institutions and schools as are controlled by the Ministry of Health, since the medical officers and officials in that service control the situation and take care that no lack of accommodation shall exist.

HEALTH SACRIFICED

The conditions are very different in preparatory and public schools, in both of which the time that should be spent in attending to what is the most vital of all functions is sacrificed to being present at Divine service. However useful this ritual may be to the ordinary boy and girl, either at that period of life or subsequently, is difficult to determine, but to the medical man, whose function should be to deal with the health of the individual and not with his spiritual uplift, it would seem infinitely preferable to attend first to urgent physiological purposes.

The proportion of boys to one lavatory is, very frequently indeed, excessive, if not ridiculous, in consideration of the small amount of time at their disposal. In one large public school, for instance, a calculation revealed the astounding fact that the time available for each individual boy was thirty seconds per day, whereas the time he devoted to attendance at Divine service was thirty minutes.

Such a state of things only requires to be realised in order that parents and medical officers should insist on care and instruction being devoted to this most important subject. It would seem urgently necessary that every preparatory and public school should be asked to supply definite information on the proportion of lavatories to pupils, on the total time allotted for their use, together with such instruction as is given, and what precautions are taken to ensure a normal healthy function.

PREVENTABLE DISEASE

It must be remembered that boys and girls are merely animals living in a state of civilisation, and that state entails the incidence of a vast amount of ill-health and disease, a huge proportion of which can be eliminated by proper food and by good habits. That the food supplied to the young, both at home and during their school life, is manifestly defective is generally recognised, and no proper attention is paid to their habits.

While these statements apply to schools, there are many adults who suffer in health quite as severely from defective sanitary arrangements. Perhaps nurses are affected as much as any during their residence in hospitals, since their times available for health purposes are too often encroached upon by services which may possibly teach discipline, at considerable cost to the health of these very hard-working members of the community, who deserve every possible consideration.

CHAPTER XIII

PREVENTION OF CANCER

WHEN will the public realise the immense importance of the part which wrong kinds of food play in the production of disease and the right kinds of food in the preservation from illness? Can anything be more maddening than the apathy and ignorance which exist so generally in the community, and which are such detrimental factors to the health and happiness of the race?

Very many years ago I demonstrated unmistakably that *cancer never affects a healthy organ*. In order that cancer shall develop it is absolutely essential to produce a diseased tissue or organ in the first instance in which alone the cancer germ can grow. This immunity of a healthy organ from the risk of cancer has been generally accepted all over the world.

The teaching of the present day is a policy of despair. Everyone who has cancer is urged to be operated on at once. This is obviously the only course to pursue if the condition is operable, but much too often the disease is not recognised till too late. *The public will not accept this situation*, but are determined to learn how cancer is caused and how it can be prevented. Cancer cannot be cured except in comparatively rare cases. It is futile to expect the public to be satisfied to accept operation alone as being sufficient to meet the situation.

The public must realise that cancer can only be avoided by following the right diet and habits, since by their means alone can the tissues and organs of the body be kept in a condition of perfect health, impregnable against their invasion by the deadly germ of cancer.

The following sentences have been extracted from a private letter received from an authority who has spent his active life in the study of diet for animals, human and otherwise, and in the part played by defective diet in the production of disease. His name is recognised as being that of perhaps the greatest living authority in his special branch of research. As the letter is a private one, I am unable to mention it. He writes :

“ For myself, I work on more and more amazed, day by day, by the extraordinary effects of faulty food on the animal organism. I begin to think that faulty nutrition is the bedrock cause of the vast majority of tissue ailments.”

What can be more complete than the knowledge that we possess of the fact that a defective diet produces innumerable diseases, while on the other hand we know that a perfect dietary renders disease impossible. Apart from the experiments and observations of those experts who have passed their lives in the study of dietetics and of their influence upon the body, we have the statistical evidence of Hoffman, who has spent very many years in the study of native races all over the world, and of McCarrison, whose experience and knowledge of diet and its effects are unrivalled, quite apart from that of a large number of other observers in Great Britain and America.

A NATION SAVED

Again, we have had Hindhede's wonderful treatment of the food shortage in Denmark, when he saved a great nation from famine, disease, and disaster.

The epoch-making discovery of Carrel, who grew living tissues on microscope slides, added to our knowledge of the causation of disease in a remarkable manner. He showed that tissues never die if correctly fed and properly drained and that any want of care in the diet and drainage of such growing tissues meant a corresponding want of vigour, degeneration, and finally death.

The mortality reports of the Registrar-General *demonstrate in such a manner*, so clearly that even the dullest intellect cannot fail to grasp, *the terrible influence of diet and habit in the production of cancer*. Let the public study these facts for themselves, since it is a matter of evidence and calls for no special training.

They must work out their own salvation, and this they will doubtless do, since they have realised the overwhelming importance of this subject to their lives and happiness.

SOME UNDENIABLE FACTS

Can anything be more futile and misleading than the statement, made under the authority of the Ministry of Health, that there is no connection between cancer and diet? *

Fortunately the matter is one on which the intelligent layman is quite as able to form an

* Reports on Public Health and Medical Subjects, No. 36. Diet and Cancer, with special reference to the incidence of Cancer upon members of certain Religious Orders. (H.M. Stationery Office. 9d.)

opinion as any medical man. It is simply a question of evidence. There are certain undeniable facts.

(1) That the manner in which the digestive system functions is directly dependent on diet. If certain foods are eaten, the contents of the big bowel, or the cesspool of the system, are evacuated at regular intervals. If suitable foods are eaten the bowel evacuates a quantity of material after each meal, proportionate in bulk to the amount of food taken.

(2) If foods deprived of those factors which stimulate the intestine to action are eaten, the contents of the large bowel stagnate, and the automatic expulsion of the fæcal matter takes place only once in twenty-four hours, and not uncommonly at much longer intervals. The fact that chronic constipation is generally distressing to the average man and woman is shown by the almost fabulous fortunes that have been made by purveyors of purgative drugs.

UNSCIENTIFIC EVIDENCE

It is undeniable that cancer never affects a healthy tissue, and that it takes many years to degenerate an organ so as to make it a suitable soil in which alone the organisms of cancer can grow.

Now, taking the facts on which the report to the Ministry of Health depends, I would point out that in Table 2 the priest who died at 74 years of age of cancer entered the monastery at $67\frac{1}{2}$, and that the second of the series entered the monastery at the age of $46\frac{1}{2}$ and died at the age of 51.

In Table 9 the first case entered the monastery

at 51½ and died at 62 ; the second entered the monastery at 41 and died at 64.

Does anyone pretend to regard such material as this as of scientific value, and as affording sufficient evidence for such dogmatic statements as have been made by the Health Ministry's investigators ? Surely such monks must be reckoned as ordinary members of the community who entered the monasteries late in life and with their tissues already slowly degenerating.

PLAIN DIET RESULTS

I would like to point out that there is a Blue Book supplement to the seventy-sixth Annual Report published in 1923, by the Registrar-General, which contains comparative death rates among people of various occupations in Great Britain. The cancer mortalities gave the following figures :—

Clergymen	. . . . .	45
Agricultural labourers	. . . . .	54
Inn and hotel servants	. . . . .	102
Butchers	. . . . .	105
Seamen, merchant service	. . . . .	110

Seamen live largely on preserved food.

The clergy probably live as plainly as the agricultural labourers, and both take much walking exercise, and eat the plainest diet, with little meat. The reverse holds good with the other categories in which the cancer death-rate is more than double. In view of these figures, surely no unprejudiced person can question the association of diet and cancer.

Perhaps one of the greatest of the results that have followed the activities of the *Daily Mail* is the

presentation by a lady of £10,000 to establish a Chair in Dietetics in London University, since she recognised how small a share the question of food took in the education of the medical student. Professor H. MacLean, in a recent issue of the *Daily Mail*, confirms her view and ours as to the supreme importance of the study of dietetics in relation to health.

VEGETARIANISM AND CANCER

The New Health Society does not pretend to be a vegetarian body. It believes that, if the functions of the body are normal, meat can be digested with advantage.

The vegetarian has learnt empirically that, by eliminating animal food from his diet, he was able to avoid the infection of the circulation by the poisons occasioned by the absorption from the food contents of his intestine, into which septic organisms have ascended. Practically his bowel resembled a warm, moist safe full of flies, and the introduction of any animal food into such a medium naturally produced poisonous materials.

That the human body can reach the summit of health, endurance and freedom from disease is demonstrated by the fact that races such as the Zulus and others depend on non-animal food for subsistence.

That the vegetarian can lead at least as vigorous a life as the meat-eater is demonstrated by the history of the Vegetarian Cycling and Athletic Club. It was founded forty years ago to make athletes vegetarians and vegetarians athletes. It can reasonably claim to have been one of the most

powerful forces of propaganda for scientific dietary. During the past season the record of the club disclosed a number of athletic successes, wrested from the great host of orthodox meat-eaters, which are simply stupendous, and so striking as necessarily to impress even the dullest and most conservative mentality, since they are out of all proportion, considering the very limited membership of the club.

PREVENTION IS BEST

Let the public think for themselves and cease to rely on such persons as state that diet plays no part in the causation of disease. It is only too true that the more the special sense is developed the less is the common sense.

We get much advice as to what treatment we should adopt when the deteriorated tissues of the body have been invaded by disease. What interests us all vastly more is the means by which we can avoid its incidence altogether. That this can be done is, in the opinion of many of us, beyond the shadow of a doubt.

Unfortunately, in the case of cancer, since its development is usually painless, it is frequently not recognised till too late to permit of its complete excision. To the ordinary man it would seem most probable that cancer will never be cured with anything approaching certainty ; therefore let us do our utmost to avoid it.

The Americans have spent millions of pounds in the search for a cure for cancer. Men's time, skill, and intelligence have been employed without stint, experiments of all sorts have been carried

out, with the result that we are little or no better off than the ancients were in the time of Hippocrates.

Let us now start investigating causation and prevention where we have innumerable data for the purpose. It will certainly prove less costly.

CHAPTER XIV

PREVENTION OF COLDS AND INFLUENZA

THE common cold, or acute inflammation of the mucous membranes of the nose and throat, is one of the minor plagues of civilisation.

This inflammation, of which the signs—excessive discharge, soreness, sneezing, and coughing—are only too familiar and render us such a nuisance to ourselves and to our neighbours, is due to the successful attack of virulent germs.

These germs are to be found in the noses and throats of most of us in the winter months, especially in the crowded cities. Whether we succumb to their attack depends on two factors—the virulence, or activity, of the germ, and the strength of the resistance that the defensive forces of our body can put up against the attack.

The microbes which give rise to nasal and bronchial catarrhs are conveyed from one person to another by coughing, spitting, sneezing, infected handkerchiefs, or even by talking at close quarters.

They cannot survive in air and sunlight, and are absent from the air of ocean wastes and mountain summits. Men living almost entirely in the open air are free from colds, no matter what exposure and hardship they may undergo.

TOO MUCH FOOD, TOO LITTLE AIR

What, therefore, is the explanation of the greater prevalence of colds in the winter months in civilised communities?

It probably lies in the fact that people in the winter months tend to shut themselves up and seek the comfort of stuffy, overheated rooms, where the virulence of the infective germs is increased and the resistance to disease is lowered by stagnant, polluted air, and by deprivation of sunlight.

Added to this, the outer air is more polluted with smoke and soot, which cause irritation of the mucous membranes, and so render them more susceptible. People take less open-air exercise and tend more than ever to over-eat in the winter months. These bad habits lead to a poisoned condition of the blood and so to a lowered resistance.

The more general the epidemic of colds the more virulent become the infective germs. Few people regard the common cold as anything more than a nuisance, and take very few precautions to avoid infecting others. A little thought and care to avoid this reprehensible carelessness of other people's welfare would do a great deal to lessen these epidemics.

Infection is conveyed principally in rooms and in badly ventilated public vehicles, where the air is stagnant and the sunlight never penetrates. Sunlight, if it is to do any good must come into a room through an open window. Ordinary window glass prevents the most useful rays—the ultra-violet—from passing through.

DON'T CODDLE YOURSELF

Draughts tend to prevent circulation and so cause colds, unless one exposes oneself to a cold current of air when overheated, or so cools the skin by

habitual overclothing that the natural heat-adjusting mechanism of the body becomes weakened and fails to act.

The body should be capable of adjusting itself promptly to sudden changes of temperature, and will do so if kept in proper training. This can be done by frequent exposure of the skin to fresh air and sunlight, by the habit of bathing in cool or cold water, and the wearing of porous loose-textured garments next the skin.

Warm woollen and heavy garments should be reserved for outer clothing, to be donned to meet unusual exposure to low temperatures. Exercise should be taken in the cold air with light loose clothing by all who can raise the body temperature by brisk walking, or the playing of a game.

HOW TO KEEP WELL

For the rest we can keep our blood clean and active by eating the foods that make for health—milk, oranges, green vegetables, good wholemeal bread and good butter in plenty ; meat, fish, eggs, and cheese only in moderate amount. The waste products of the body must be freely got rid of by ensuring activity of the bowel and by the cleansing action of liberal draughts of water.

To sum up. While avoiding as far as possible the depressing effects of sudden exposure to a lowered temperature by the use of suitable extra clothing, try to habituate the body to moving cool air by day and night—keep the feet warm and the head cool.

Expose large areas of the skin as often as possible to the open air and the sun.

Keep the body clean internally as well as exter-

nally, and if, alas ! you should succumb to a virulent dose of infection, treat it seriously and isolate yourself as far as possible during the early stages.

Any chronic obstruction to free breathing through the nose or unhealthy condition of the teeth or tonsils should be treated under medical advice. These conditions considerably increase the liability to " catch cold."

DEADLY POISON

Many members of the public do not realise the immense importance of avoiding any strain during convalescence from influenza.

The poisons associated with this infection are distributed to all the tissues in the body, whose capacity to resist and overcome their deleterious effects varies with their vitality. The tissues of those who are properly fed and whose gastrointestinal tract functions normally possess in a remarkable degree a vitality and a capacity to resist the influence of the poisonous effect of the influenza organism.

On the other hand, the tissues of the usually overfed and badly nourished person, whose sluggish intestine collects and retains a quantity of decomposing matter for an excessive period of time, have a very low vitality and resisting power to the organisms of influenza and to their products.

Since this class comprise the bulk of the community, it is most essential that they should occupy the horizontal posture and avoid any strain upon the heart muscles, enfeebled by wrong diet and habit, and poisoned by the toxins of influenza, till

a considerable time has elapsed and all the organisms and their poisonous secretions have been eliminated from the body.

A man too often feels that his attendance at some function is so essential that he gets up from his bed and takes just such an amount of exercise as throws an excessive strain upon his enfeebled heart, and many pay the penalty in death or in a permanently dilated and damaged heart.

Let the public remember that the poison of influenza is a very deadly one, and that much time must be permitted to elapse to enable the tissues generally, and especially those of the heart, to resume their normal function.

In no other disease is prolonged rest in the horizontal position more essential. Quite apart from the risks from a poisoned heart, there must be taken into consideration the lowered resisting power of the lungs to the organism, which is abundant everywhere and which is the cause of pneumonia.

A STRIKING DEMONSTRATION

In response to many anxious inquiries as to how it is possible to avoid influenza and, if caught, to escape any serious result, it is necessary to say this can only be ensured by "*Keeping Fit.*"

How this can be done was demonstrated in a most striking manner by the results of Dr. Hindhede's gigantic dietetic experiment in the whole country of Denmark. Too much stress cannot be laid on the value of the measures he adopted, because of their perfect simplicity and of the facility with which they can be followed in this country, with a certainty that, by adopting them,

almost perfect immunity from influenza can be granted.

They are so important that they cannot be repeated too often. By rendering the diet of the people as simple as possible, by adding to the wholemeal bread a quantity of bran, by avoiding animal and rich foods, and by eating fruits, vegetables, and dairy produce he reduced the mortality from all diseases to the lowest figure known and so improved the vitality and resisting power of the community to disease that while influenza caused a death-rate of at least 25 per thousand in other countries the death-rate from influenza in Denmark did not exceed the normal.

Let all thinking persons derive from a consideration of the measures he adopted, with such success, the knowledge of the simple means by which anyone can KEEP FIT.

THE ONLY CERTAIN WAY

It is, indeed, the only certain way by which influenza can be avoided and the risk of complications or of death reduced to a minimum. Will the world never learn to take advantage of the wonderful lesson which Dr. Hindhede's action, in changing by law the diet of the entire people of a country, taught?

As the Americans would say, let us get down to "brass tacks" and deal with the problem in a common-sense manner. Begin at once by discussing with those who control your dietary how best you can simplify it and how effectually you can eliminate all such tasty and so-called digestible foods as are wrongly regarded as essential to stimulate your jaded palates. You will be met

by the statement that what custom provides is correct. This argument can be countered by the fact that custom is now rendering influenza very prevalent and very fatal, to say nothing of the innumerable complications so often associated with it.

Therefore, if you want to avoid the incidence of influenza, KEEP FIT.

IT IS THE ONLY WAY

In addition, *don't* help to spread infection.

Avoid coughing, sneezing, and spitting in close proximity to others. If you succumb to infection, isolate yourself at once and remain warm and in bed until you have recovered. Avoid stuffy, overheated rooms and get into the fresh air as much as possible. Sleep with open windows and avoid crowded places when there is much influenza about.

CHAPTER XV

THE LUNGS

I AM indebted to Sir Bruce Bruce-Porter for the present chapter dealing with the vastly important subject of the care of the lungs.*

The melancholy fact that nearly one-third of the total deaths per annum in this country result from lung conditions is a sufficient indication of the importance of educating the people in the prevention of such mortality. But this does not take into account the vast and incalculable amount of ill-health suffered by many millions of people, from the same causes, leading to a lamentable mass of unhappiness. It is the aim of the New Health Society to teach the people how to keep fit, and so to resist the infection that finally results in disease and death.

By SIR BRUCE BRUCE-PORTER

Great fortunes have been made in the industrial world by the discovery of simple principles which, when applied, have proved of advantage to millions, rather than by the manufacture of complicated objects which are of use to the few.

In the health world, it is by teaching the simple laws of health applicable to the multitude, more than by the recognition of rare diseases which

* The author has contributed valuable additional matter to that published in the *Daily Mail*, and incorporated it in the text of this chapter.

afflict a few, that we shall build a new England of healthy men and women.

These short chapters aim at expressing these simple health laws in such simple language that they will be appreciated by the plain folk who constitute the bulk of the community. Even those who are numbered amongst the more fortunate group are, in the main, profoundly ignorant of the structure of the body and of the simple rules which are essential to its care.

The preceding articles have dealt largely with the evils which result from neglect of the main street of the body and the resulting poisoning, and if we may judge by the remarks made on all sides by those anxious to learn, they have been productive of much good.

The reports of the distinguished Chief Medical Officer of our Public Health Services are a mine of information, and Sir George Newman, in his report for 1924, gives tables showing the chief causes of death. Nearly half a million die from affections of the Respiratory System, and Consumption is sixth in point of numbers.

The terminal stage of most medical diseases is pneumonia, and in addition to those who are actually notified as having died of consumption, we must take into account the vast number who, owing to this disease, become so lowered in vitality, that they fall victims to other ailments which prove fatal.

Two things are obvious to the most casual observer: (1) Tubercular disease is so widespread that it is quite impossible to avoid risk of picking up the tubercle bacilli; in fact, almost every child in the British Isles goes through an

invasion of tubercle during its early years ; (2) once the disease has been allowed to obtain a substantial foothold in the chest, doctors have no drugs which of themselves can bring about a cure, and before we can rely on vaccines we have a long time yet to wait, during which many thousands will have passed to the Great Beyond.

How, therefore, are we to combat this terrible scourge ? First and foremost, by a general raising of the health of the body as a whole.

STRUCTURE OF THE LUNGS

We must grasp the full meaning of that great teacher of ancient days, Hippocrates, who said, "The body has in it the nature to cure." The primary essential is, therefore, that everyone shall have some knowledge of its structure. It has been said with much truth that, given a good chest expansion and a good blood supply, we may defy tubercle.

To understand the importance and meaning of chest expansion, think of the structure of those vital organs the lungs. The windpipe divides at the root of the neck into two trunks, one for each lung, and this subdivision goes on till the final branches are only about one-fiftieth of an inch in diameter and end in a little bladder with indentations in its sides.

The great blood vessel entering from the heart is similarly divided till you have merely a layer of cells between the air and the blood, and through these cells the great interchange takes place which converts the dark, venous blood into the bright arterial, which is collected and taken back to the

heart, to be pumped throughout the tissues which make up the body.

In order that life may be maintained, the food we eat must be burnt up to produce heat and energy ; for this process of combustion—as indeed with any other—oxygen is essential.

FRESH AIR

On its way through the lungs the blood gives off carbonic acid as well as other waste material and takes in oxygen. This oxygen enters into combination with the iron in the blood, which acts as a carrier. The quantity of iron is very small, and when for any reason it is deficient the pale face of the sufferer and the shortness of breath soon draw attention to the fact.

Frequent interchange of air is necessary. The normal rate of breathing is about seventeen times a minute, and during the same short time the heart beats about seventy-two times. At each beat in the adult it pumps about two ounces of impure blood into the lungs and extracts the same quantity of purified blood. It is obvious that, unless the air is changed thoroughly, the blood on its way can neither get rid of all its waste material nor collect enough oxygen for the requirements of the body.

The act of breathing is an aid to circulation, as can be seen by the way in which the rate quickens on exertion. In man's natural condition he had fresh air and few clothes to hamper his breathing. The exertion necessary to collect his food caused full movement of his lungs.

To-day the picture has changed. Civilisation has increased the wants of the people, and indus-

trialism has resulted in assembling large collections of human beings in confined areas. Most of the working hours are spent in closed rooms, the leisure hours largely in crowded places of amusement, and the sleeping hours in small rooms, often with closed windows. Modern men's clothing might have been designed to hamper chest movement.

It is not enough to quote statistics to prove that the death-rate from consumption is less than it used to be ; it is not of the least interest to the sufferer from this disease to know fewer people share his misfortune, nor is it any consolation to a poor mother who has buried several children who have fallen victims to tubercle to be told that a generation ago even more died of it. She is rightly concerned with finding how to save her remaining children and, as she cannot avoid exposing them to the germs, she must be taught how to care for her children, though they are so exposed.

The policy of the open window is a thoroughly safe one. Again, she must recognise that obstruction of the airway by enlarged tonsils and adenoids is fatal to good breathing, and they must be removed. I am frequently asked whether tonsils have no useful purpose in the body, and, if so, why remove them. I can only say I am satisfied they have some very useful function, or they would not be found situated as they are at the entrance to the main street of the body.

REMOVAL OF TONSILS

I am satisfied that a watch dog is very useful at the gate of a house, but if the dog were infected with rabies he would cease to be a protection and

would become a grave source of danger, so destruction would be necessary ; and so with the tonsils when they have become infected and a source of danger. They must be cleared out.

Adenoids are an additional problem, as, unless regular use be made of the nose, once they have been scraped they will recur and call for further operations.

Children can be taught deep breathing by many simple games. The expression of a child who is unable to breath properly is very characteristic. The stupid, open-mouthed look is such a reproach to those responsible for its early care. Children are better cared for in this respect than they were a generation ago, as can be seen by comparing a photo of a group of poor children twenty-five years ago with a group of similar children taken to-day.

Having got this importance of fresh air into your mind, set to work and see whether you cannot improve the conditions under which we live and work.

There is no excuse for the clouds of smoke which are poured from factory and home chimneys in our cities ; it is a waste of fuel, and, what is more, it is damaging to our health.

Women to-day could revolutionise our social conditions if they cared to. The mother has the care of the child during the important pre-school years and must remember that the habits she instils into the children in those years are the ones which will decide their future.

Habits of health, like those of morality, are the results of early training. Teach the child to hold himself or herself correctly and to take some pride

in doing so, and we shall start it out with a great advantage. We need open-air schools for the fit ; it seems to me to be so stupid that we wait till a child breaks down in the ordinary school in a crowded street and then send it to do lessons in the park, instead of sending more fit ones for periods of open-air classes to prevent the breakdown.

The question next arises—what can be done by the adult to improve his chest condition ? We seem to have forgotten many of the lessons of 1914-18, but surely we can all remember the transformation brought about in the average man by a few weeks in training camp. Let those who were taught then, put the lessons into practice again. It does not require much time, just the few odd moments throughout the day. Health is purchasable by personal attention, but you cannot maintain it if you neglect the use of the lungs. Breathing not only clears out the carbonic acid gas, there are other much more poisonous materials thrown out by the lungs. We hear so much about carbonic acid gas, merely because it is a thing we can estimate, and so is used as a general guide to degree of impurity, but if we could eliminate the other materials we could tolerate a very much higher proportion of CO_2 .

We have all experienced the tired feeling after attending a crowded meeting in a badly ventilated hall. That feeling is due to the other poison products I refer to and not to carbonic acid gas.

The Factory Acts do a great deal of good in the places to which they apply, and if their use is ever extended to the underground places where men and women work year in and year out by artificial light, in rooms with no thorough ventilation, we

shall benefit that great army of black-coated workers, the city clerks.

What chance has a clerk who has not been endowed with a robust constitution, when with a lowered vitality due to a poor diet plus financial anxiety, he spends his day in such an office as I refer to, which is shared by another clerk suffering from active tubercle, coughing up myriads of bacilli? Is it any wonder so many break down from lung disease? Too many wait to-day until the doctor finds the bacilli in their sputum before they trouble in the least about the condition of their lungs. They make the idle, foolish boast, that they don't mean to trouble about their condition. What should we say to our chauffeur if he said the same about our motor car?

There is no need to get into a panic. As a matter of fact, the better your general health the less likely you are to get frightened.

Prevention is generally admitted as so much better than cure, but, at the moment, it is in the theoretical stage, if we are to judge by the huge sums subscribed to finance our hospitals and to build palaces for the unfit, and contrast it with the small amount spent in the propaganda of preventive work.

Take trouble about the care of your lungs and it will repay you with a sense of fitness. Do not wait for a breakdown before seeking advice. Get your family doctor to examine you from time to time and point out any signs of strain. It is better to have weak tendencies recognised early, even if it means a change of occupation and a readjusting of life. Better to do this when young than to have it forced upon you later on in life.

The early signs of weak lungs are loss of energy, loss of appetite, loss of weight, a slight evening rise of temperature, a cough which is more noticeable by your friends than by yourself, and, later on, sweating at night.

Early lung trouble is a curable disease in most instances, not, as I have said, by drugs, but by hygiene. Don't chop and change your doctor. Having made your choice, stick to him, and require some very real reason for changing, as it is a great advantage to you that one man shall be able to compare your general health from year to year, rather than having stray opinions of so-called specialists, who just examine a small section of your body and have no knowledge of that important factor, your home and general life. Special opinions are of use when used in conjunction with your own doctor, but they will not save a fool who contracts consumption.

CHAPTER XVI

OBESITY

DR. LEONARD WILLIAMS, who has recently written an important book on obesity, shows the importance of fat in the diet, while emphasising its distinction from over-fatness, with its consequent injury to health.

By DR. LEONARD WILLIAMS

The physiological sanction for a certain measure of feminine rotundity reaches back to primeval times. Just as man was obliged to keep himself in training for his intended functions of fighting and hunting, so was woman obliged to keep herself prepared for her function of motherhood.

To this end it was necessary for her to store food in excess of her present needs, so that in the event of a pregnancy befalling her when food was scarce there might be an adipose granary to draw upon.

This subconscious physiological foresight has remained with her through the ages, and it is almost certainly related to the preference for curves as against angles which still persists in the male sex. It was but yesterday that all women prized plumpness ; to-day they shun it like the plague.

Though there is much to be said in favour of the present fashion, especially in the case of middle-

aged women, there is some danger lest it may lead to untoward results in at least two directions.

Adipose tissue is recognised as occupying a special place in maintaining the stability of the nervous system. The why and the wherefore are not understood, but the fact is not in doubt. It is therefore to be feared that the intemperate cultivation of the slim figure by the avoidance of fats may increase the incidence of the very "nerves" and "vapours" which are now so severely tabooed.

THREE STAGES

That is one point. The other is provided by a writer in the *Lancet* of January 8, 1927, who points out that an absence of fat from the dietary has a very decided influence in the causation of tuberculosis. Consumption, it appears, is very much more prevalent among the fat-shy than among the fat-eaters, so that it behoves those who would avoid any truck with the white scourge not to regulate their dietary on the pattern of Jack Sprat, who would eat no fat, but to frame it on some more inclusive standard.

It has been said that there are three stages of obesity; the enviable, the comical, and the pitiable. The degree of fatness which in a woman would be quite properly classed as enviable, when transferred to the male at once becomes comical. Obesity in a woman is always either enviable or pitiable, seldom or never comical. In man it is seldom anything else.

CHAPTER XVII

EFFECTUAL EXERCISES

CONSTIPATION, or the habitual overloading of the large bowel, may be regarded as the White Man's Burden. Only the civilised man has to bear this burden. The native, like the baby, empties his lower bowel naturally at least three times a day.

This is partly a matter of habit and partly a matter of diet. In adult life to effect this efficiently necessitates a certain amount of exercise of the right kind.

In athletic training the importance of frequent discharge of the waste products of the body is generally recognised. Men know that the evacuation of the bowel after each meal makes them feel fit, and that it retards and lessens fatigues. Boxers are also aware of the advantages afforded by the normal action of their intestines.

But the ordinary citizen—even when he is not fat elsewhere—too frequently develops a prominence of the lower part of the abdomen which may be very conspicuous. It is a sure sign that something is wrong.

The prominence of the abdomen so constantly seen in civilisation is not only extremely inconvenient to its owner but it is also very ugly and disfiguring. Regular habits of evacuation, such as exist normally in native races, can be readily

restored to the civilised man by care and attention to diet and exercise, unless there is some mechanical defect in his intestinal tract. These habits can be acquired by attention after each meal. Some patience and perseverance may be necessary in certain cases, or some dietetic modifications may be required. Sound advice on this point has been given by the New Health Society in its monthly journal, and in many other publications.

BENEFICIAL EXERCISES

Exercises especially intended to promote the normal functioning of the intestines are related clearly in "The Culture of the Abdomen," a work strongly recommended by the New Health Society. The following * describes two of the simplest and most effectual exercises. They can be done by the delicate and feeble with ease.

1. Lie on the back, on a folded blanket on the floor, or a hard mattress. Relax the abdominal muscles completely. Slowly draw in air through the nostrils and allow it to distend the abdomen. Then contract the abdomen slowly and steadily, expel the air as far as possible, finishing with the abdominal wall well drawn in. Repeat this ten or twenty times, or more as it becomes easier.

2. *Hammock Swing*.—Lie on your back on a folded blanket on the floor; bend both knees, soles of feet on the floor, knees about 12 inches apart, heels close to the hips (a pillow under the head prevents rush of blood to head); both hands flat on floor, arms by sides.

Raise hips about 2 inches or 3 inches from floor,

* Quoted from "The Culture of the Abdomen," by F. A. Hornibrook (Wm. Heinemann (Medical Books), Ltd., 6/-).

and while body weight is resting on head and shoulders and feet vigorously swing the body from side to side, keeping shoulders flat on floor and throwing each hip upwards alternately.

Repeat twenty times—ten to each side. Rest. Repeat this cycle five or six times—100 to 120 beats in all with five or six pauses.

The great advantage of this exercise is that, as the abdomen is held loosely, the movement exerts a deep and rolling action on the intestines, stimulating their muscular wall to action, and it is of great utility in remedying constipation. The effect is enhanced if the exercise is performed the first thing in the morning and is preceded by drinking a large quantity of hot water. Breakfast should follow this exercise at an interval of not less than half an hour.

EXERCISES IN THE STREET*

The remedy for undue deposition of fat is constant movement; that is, the retraction and release and the rotation of the abdominal wall periodically during the day.

For example, while a man is standing waiting for an omnibus for a few minutes, instead of wasting his time fretting and fuming he can quite imperceptibly retract and release his abdominal wall in such a way as effectively to stir up the abdominal organs, and thus help to prevent sagging of the abdominal wall and stagnation of the contents of his bowel.

It is much more profitable to stimulate to

* The practical hints given in this section are taken from "Physical Fitness in Middle Life," by F. A. Hornibrook (Cassell, 6/-).

action the abdominal contents by such simple means than to stand idle and impatient.

After a little practice a man can also do a circular or rotary movement of his abdomen by rolling the abdominal wall from right to left or from left to right, without such movements being perceptible to the casual passer-by.

Similarly, when a man is sitting in his office chair he can retract and release his abdominal wall backwards and forwards and rotate it in different directions. If he sits well back in the chair so that its back supports the lower part of his body rather than his shoulders, he will find that automatically he assumes a correct posture—with his abdomen well retracted and not resting forward in a heap.

Again, when a man wakes up in the morning, while lying on his back with a low pillow he can retract and release the abdominal muscles a few times with advantage and so stimulate evacuation of the bowel later. While lying on his back in bed he can also perform the following movements: Rest the body weight on the shoulders and heels, tuck in the abdomen, and at the same time contract the muscles of the hips so as to arch the back. The contraction of the muscles of the hips is a very effective means of obtaining abdominal control, as by this measure the hips are held down.

Of course the breath must not be held, but exhaled as the abdominal wall is drawn in and inhaled as it is released. These exhalations and inhalations should not be powerful respiratory movements, because the main purpose of this exercise is to activate the abdominal muscles and not to empty and fill the lungs.

These exercises are equally applicable to men and women. Exercises specially useful for women are described in "Exercises for Women,"* to which the reader is referred for further information.

* By Ettie A. Hornibrook (Heinemann (Medical Books), Ltd., 3/6).

CHAPTER XVIII

KEEPING THE BUSINESS MAN FIT

It is correct to say that British trade is the life blood of the nation, and it is our supremacy in trade that secures for us the prestige and prosperity which we now possess and of which we are justly proud.

The entire administrative responsibility of trade, or, in other words, what is vital in our national life and success, falls upon the shoulders of a comparatively small number of men and women who have generally reached the meridian of life or have passed beyond it.

It is, therefore, of vital importance to the community that the business men on whom so much depends should take the greatest possible care of their health and retain their powers as long as possible.

It is the unfortunate experience of medical men that, owing to faulty diet and incorrect habits, these people frequently degenerate, or break down, at a period of their lives when they should be most useful to themselves and to the community.

The basic factor underlying this failure to make good is always the same and is one for which the individual is solely responsible. When he begins to fail physically or mentally, or both, he is regarded as suffering from "brain fag"; and

“neurasthenia,” to use the word recently coined by the medical profession, represents a condition which is due solely to ignorance, selfishness, stupidity, and neglect on the part of the sufferer.

NO SYMPATHY DESERVED

These people should realise not only that they do not deserve any sympathy for the condition which they have brought upon themselves, but that they have no right to inflict their misery, inefficiency, and disability upon their relations, friends, and the community generally. And the public should come to regard failure in health as immoral, and indeed criminal. When this change comes the evidences of degeneration which are called brain fag, neurasthenia, and disease will cease to exist, and the country will derive the full advantage it has a right to expect from the mentality and experience of those upon whose activities it depends for success.

Let these people study, understand, and obey the laws of health as laid down by the New Health Society, let them realise that diet is a matter of vital importance to them, that unless they eat such foods as will nourish their tissues and will stimulate their intestinal tract to function in the normal way, which is absolutely essential to perfect health and to a long, useful life, they cannot expect to bear their share in the world's work efficiently.

At the present time these people eat an excessive amount of food, which, being quite unsuitable for the purpose, is utterly ineffective and unfitted to enable them to have healthy bodies and bright mental activity.

GOOD HEALTH, GOOD WORK

It should be urged also that these business people should not confine their activities to the care and attention of their own bodies, but should take a very active and practical interest in the food and habits of those they employ and upon whose work their businesses depend very largely for success.

This action on their part, while philanthropic, is certainly not entirely unselfish, for only poor work can be done by those who employ workmen of poor physique. Any time, care, and money spent in effecting this purpose will return to them huge dividends in money and satisfaction.

Few realise how much good can be done by the combined action of employers if they will arrange to meet at luncheon and discuss this matter of diet and habits, which is most important to the welfare of the nation. It is the essence of the teaching of the present day. Let their motto be

SAFETY FIRST.

CHAPTER XIX

THE BUSINESS GIRL'S HEALTH

THE following description, written by a girl worker, of some of the many difficulties and disadvantages under which the work of many thousands of girls earning their living in the great cities has to be carried on, has been sent to me.

I think it not unworthy of publication in this book as showing the great need that exists for reform in many directions which will enable the working girl to carry on her occupation without the detriment to her health at present involved.

“Most girls, owing to their rising at a late hour, have very hurried, if any, breakfast. This usually consists of white bread, bacon and eggs, or fish, jam, or marmalade. They then rush to their train or omnibus, which is usually very crowded. In many cases they have to stand, which in a long journey is very fatiguing. Often when travelling on tops of omnibuses they get very wet and they may catch a more or less severe cold.

“On arriving at the office they hurriedly divest themselves of their coats and begin work. In some offices proper typing desks are not provided, and this causes backache and eye strain.

“The rooms are often badly heated or not well ventilated in the winter, while the outlook into the street is generally uninteresting. In many offices

a fixed time is given in the morning and afternoon of, say, three minutes for washing. This is really not enough.

HURRIED LUNCHEON

“ At 12 or 1 o'clock the girls go out to luncheon, in most cases to one of the popular restaurants. At this hour the restaurants are, of course, hopelessly overcrowded and very hot. The waitresses are consequently overworked and cannot take orders at once, so the girls have often to wait twenty minutes or more before they can be served. This causes them either to eat next to nothing or very hurriedly in order that they may get back to the office within the hour.

“ The usual luncheon consists of a choice from steak and kidney pudding, chips, baked potatoes, fish, fish cakes, white bread, egg on toast, steak, ham, roll, butter, cheese and coffee, curries, and so on, all the hot dishes being re-heated.

“ After this might follow college pudding, made with white flour, the pudding being very heavy, fruit pie, flans, meringues, pastry which is highly coloured, chocolate biscuits, and so on.

“ In the summer salads are not to be relied upon as being clean, and enough refreshing and tasty luncheons are not provided. It is also very unusual to obtain fresh fruit of any description, apples costing at least 3*d.* or 4*d.* each.

“ After lunch they return to the office, usually feeling very stuffy, and in strict offices often do not have time to wash properly before settling down to work again. After working very hard, with sometimes a few minutes' break for tea, they leave about six or half-past, rush off for their

trains, and often have to stand again through a long, tedious journey.

"On arriving home they feel too tired to eat anything, but if not they eat their meal quickly and hurry off to the pictures or to a dance, or some other place of amusement. They then get to bed very late and find it very difficult to get up in the morning."

One cannot but feel deep sympathy with the working girl in her struggle to keep herself in health. In many business establishments she is regarded as a mere chattel whose health and happiness do not materially interest the proprietors or heads of the business. If her work is not satisfactory, or if her health is not good, she can be immediately replaced from the vast number of girls on the look out for such an occupation.

CHEAP AND GOOD FOODS

The attention of employers of girl workers on a large scale should be directed to improve, as far as possible, the conditions under which their employees carry on their work, and it will be to their advantage to ensure that ample time and opportunity are given to these girls to obtain suitable meals and to secure their personal comfort during working hours, so that their health may be maintained.

At the same time popular education on matters of health, such as is being carried on by the New Health Society, must do its part in teaching these girls how they can best keep their health. Especially do they need to know how to expend the small amount of money at their disposal to the best

advantage on such foods as will provide the greatest result in preserving the health of the body and affording the energy and protection against disease which are vitally necessary to them in their arduous and often monotonous occupations.

CHAPTER XX

ADVICE TO GIRLS AND BOYS

YOU boys and girls will find yourselves in a world in which you will be controlled, fed, and educated by people who have fixed ideas and who do not wish the routine of their lives to be upset by any active manifestation of originality on your part.

You are expected to maintain a passive attitude, to obey instructions, and generally to be seen and not heard.

This is hardly the attitude that you should assume. From your earliest years endeavour to think and to question the wisdom of those who are older, but not always wiser, than you are, since their minds too often move in a deep groove out of which they cannot escape. You may safely assume that very much of what is generally accepted as true is false.

Take, for example, the position in which you should hold your feet. As soon as you learn to walk, your mother and nurse insist that you should turn your feet out. Later in life your schoolmistress and your schoolmaster, the dancing master, the school sergeant, and, should you go into the Army, the drill sergeant, all insist on your turning your feet out.

The assumption of this attitude in walking is wrong and harmful, and certainly not graceful.

If you run, you turn your feet inwards ; if you rest, your feet assume a resting posture and are turned outwards, and when you walk your feet should be parallel to one another. If you habitually turn your feet outwards, you assume the attitude of rest and so make your feet flat. It is to avoid this flattening of the feet that later in life you girls will wear high heels.

Incidentally, the foot, in the position of activity which is necessarily assumed when you wear high heels, is shorter and looks smaller, and is consequently more graceful. *For these reasons a moderately high heel is advantageous to the adult girl.*

FORM HEALTHY HABITS

Another much more serious and important fallacy, and one that is universally accepted, is that your bowels should act only once a day. This bad and pernicious habit causes infinite harm and anguish to many, since it leads to the clogging of the intestines with a lot of decomposing, poisonous material which makes you anæmic, spotty, dull, inactive, and unable to retain in your memory much of the material which your teachers consider is useful for your education.

Too often little girls complain that any request to leave the room for a necessary purpose is met by the teacher with a remark that "you are a naughty, dirty girl, you ought to learn to control your feeling," and you are obliged to acquire a habit which is most detrimental to your health, chiefly to meet the convenience of your teacher.

Just remember that you are a young, growing animal no different in your habits and life from

other animals, that if you keep pet dogs you take care that after their meals they go for a run so that the house may be kept clean, and that you should pursue exactly the same habit after each meal.

If you wish to grow up to be a fine, vigorous man or a woman who is able to have robust children and to take proper care of them, it is absolutely essential that your inside shall be clean, and by that is meant that you should be as regular and careful in your habits as are your pet dogs.

You will find the whole world against you. In most schools the attention given to this most important subject is practically *nil*, and the accommodation necessary for the purpose in even the most expensive schools is a disgrace to civilisation.

Nevertheless, if you persist in acquiring regular habits while still young you will, with the help which the New Health Society is endeavouring to extend to you by remedying these terrible abuses of school life, be able to pursue a healthy life later by acting on your own initiative. If you girls keep your insides clean, you will have red lips and rosy cheeks and will not require to paint them while you are still quite young.

BREAKFAST FOR BOYS AND GIRLS

In a previous chapter I emphasised the importance of you boys and girls forming regular habits, so that your systems may be kept clear of poisons.

As you may be already at a disadvantage in this respect, owing to the faulty training you have experienced at the hands of your mother and nurse, it is most important that you should eat

such food as will cause your intestines to function in a proper manner.

First thing in the morning when you get up drink one or, better, two tumblers of water, preferably warm. The water will carry away any deleterious product of digestion which may remain in your circulation.

After you have had your bath in the morning spend five or ten minutes doing some abdominal exercises.*

Then for breakfast have a soup plate full of porridge made from oatmeal, or, better still, from rolled English wheat. You can with great advantage add to the cooked meal a quantity of uncooked. The latter will help to stimulate the activity of your intestinal organs. Add plenty of rich milk to the porridge, and put some raisins or currants in it, as they will make it more tasty and they are very nourishing.

You will be told that you must not swallow the skins or the seeds, as they are indigestible and might give you appendicitis. That is all nonsense. It is most important that you should eat plenty of what is called indigestible material, since it remains and develops the muscle in the wall of your intestine and stimulates it to contract. An egg, with plenty of wholemeal bread and butter, helps to make a very nourishing meal.

As well as the porridge you should eat an orange, or a grape-fruit, or an apple. *On no account eat any white bread.* The millers abstract from the wheat, which is the finest food produced in nature, just such materials as are essential to health. These things which are eliminated

* See Chapter XVII.

from white bread possess such exceptional food qualities that they are sold at a high price for the benefit of cattle, who thrive and fatten on them.

Much of what is called brown bread is sold with the object of suggesting to the public that it is obtaining wholemeal bread. Avoid any bread that the baker cannot guarantee as wholemeal, and pay no attention to the attempts on the part of bakers to substitute an article which is not only not nutritious but is most deleterious to health.

The stupid habit of eating white bread and cakes and pastry made with white flour is steadily disappearing, except among the most dull and ignorant portion of the community. In Italy Mussolini, in his wisdom, has made it criminal to sell white bread.

LUNCHEON FOR BOYS AND GIRLS

In previous chapters I discussed the vital importance of forming regular and healthy habits.

Take care that you have plenty of time for your breakfast and for the visit to the lavatory afterwards. *Let nothing interfere with either on any pretext whatsoever.*

If you are having your luncheon at home eat plenty of wholemeal bread, thickly spread with butter and, if you like, with honey also.

Fresh cheese is also most tasty and nutritious, with a plate of salad, containing lettuce, watercress, radishes, tomatoes, cucumbers, and other uncooked vegetables.

Never eat cooked fruits, always uncooked. If not distasteful to you a quantity of olive oil poured over the salad is very helpful to digestion. If, however, you have to take your lunch with you

to school, you must replace the salad by some fruit, such as an apple, an orange, some dates, or a handful of raisins or sun-dried bananas.

Do not eat anything between your breakfast and lunch. And remember to follow the habit of your pet dogs after lunch. For your dinner have a basin of soup made of good stock and containing plenty of vegetables. You can have fish or meat with this meal, if your habits are regular. Take plenty of steamed potatoes and other vegetables with butter, also some uncooked fruit.

ENJOY EACH MEAL

Try to enjoy each meal, never hurrying over it. Do not be tempted to eat pastry, puddings, or sweets, but choose such foods as require to be thoroughly masticated. In that way you will develop your tongue, your teeth, and your jaws. Drink a glass of milk with both your lunch and dinner. Milk is a wonderful food for developing your physique.

If you have a pain in your stomach, it is due either to your having eaten some poisonous or irritating substance, or to an insufficiently frequent evacuation of your bowels, a very serious fault on your part for which there is no excuse.

At all times during the day acquire the habit of breathing deeply, filling your chest to the utmost and improving its measurement. Always keep your mouth shut during this exercise, so that all the air passes through the nose.

Remember that the nose is made to transmit air and requires constant ventilation. *The mouth is for food and not for air.* If air is not driven habitually through the nose you get adenoids and large

tonsils, and unless you develop your chest by deep breathing you poke your head forwards and stoop and develop curvature of the spine.

A child that does not masticate food thoroughly develops an ugly, retreating chin, and if the nose is not constantly ventilated by the vigorous passage of air the jaws are cramped, the upper teeth stick out prominently through an open mouth, and the face is deformed in consequence.

No boy or girl has any excuse for being disfigured in this manner. To make the best of your face and to make it most attractive it is necessary to pay constant attention to mastication of your food and to respiration.

OPEN THE WINDOWS

Always see that the windows of your bedroom are opened wide before you go to bed so that you breathe clean air during your sleeping hours.

Never wear tight boots and avoid any which have pointed toes, as they produce painful deformities of the feet when you are older. Wear your clothing as loose as possible and expose as much of your body as you can to the air and sun.

All games are useful in moderation, but please remember that if you exhaust yourselves by over-exertion you may damage important vital organs permanently. The want of control in this important matter is very conspicuous in many boys' schools where everything is sacrificed to sport.

If you find that the exercise makes you breathless for any time be sure and let the master or your parents know. Do not spend your pocket money on sweets or cakes, but buy good healthy fruit of any sort with it.

CHAPTER XXI *

OUR DAILY BREAD

IT is scarcely necessary to point out that bread and other articles of food made from flour form a very large part of our daily food.

At a rough estimate flour provides the average working-class family with nearly half of the food that produces heat and energy—that is, half the fuel required to drive the engines of the human body.

It represents anything from one-fifth to one-seventh of the weekly expenditure on food and constitutes one-half to two-thirds of the total weight of food consumed.

One would suppose, therefore, that this particular food substance would be the last we should choose so to degrade that one of the greatest living authorities on diet is able to say that “white flour is not only the most important and widely used article of diet in Europe and America, but it is notably deficient in more dietary factors than any other food except sugar.”

HEIGHT OF FOLLY

This sweeping statement in condemnation of white flour is well merited. The milling process to which our cereal foods are subjected is one of

* The next few chapters deal with various important foods. No attempt is made in the present small book to cover this vast field comprehensively, but it is hoped that the treatment of the subjects selected will give some idea of the quality and value of recent scientific research into the relation between diet and health.

the worst things civilised man has devised for his own undoing. Deliberately to remove certain parts of the wheat grain so as to please the eye and the palate while we rob the body of invaluable material for its well-being is surely the height of folly. Yet the vast majority of people in this country and America prefer this staple substance of their diet to be thus degraded.

CAUSE OF PARALYSIS

White flour is produced by removal of the germ of the wheat grain and of its branny coverings. In this germ and bran are contained the special vitamin substance on which the health and vitality of the nervous system are largely dependent.

If this substance is absent from the daily food to a serious extent paralysis and death will ensue. A less marked deficiency causes serious disorder of the bowel and leads through constipation to bowel disease and grave impairment of the general health. Removal of the bran deprives the body of valuable mineral salts and the bowel of its natural stimulation to efficient action.

Bread containing the bran of the wheat encourages proper mastication, and so promotes a healthy condition of the teeth and gums and a full development of the jaw bones by providing them with proper exercise.

VALUE OF MASTICATION

Its absence from bread is largely responsible for the widely prevalent diseases of the teeth and gums. Mastication also promotes a free secretion of saliva and of the important ferments contained in it so essential to proper digestion.

The people of Sweden, who make their bread from the entire grain of rye, bake it so hard that the most thorough and vigorous mastication is necessary. Rye bread can now be obtained in quantity in this country, and is to be highly recommended.

Wholemeal flour can and should be used for all purposes for which white flour is now employed, such as in the making of pastry, cakes, and so forth. By its universal adoption a very great improvement in the health of the community could be obtained at no cost beyond the sacrifice of a totally unfounded prejudice in favour of the whited sepulchre now so popular.

The jewel of health lies in the *whole* grain of the wheat, but the pearls are thrown to the swine and man is deprived of his heritage and his health.

CHAPTER XXII

A PERFECT BREAKFAST FOOD

A VERY large number of correspondents seem greatly perplexed by the difficulty they experience in providing a diet acceptable to the members of the family unless meat is included in it.

The food intelligence of the average housewife must be very limited if, out of the abundance of fruit and vegetables that are accessible to her, combined with dairy produce, she is unable to provide a most attractive diet for those of her family who do not wish to eat animal foods, or who, owing to the defects which develop so frequently and so early in their intestines, should not eat them.

It has been pointed out that the soldiers of Wellington, with their wives, and the legionaries of Rome, subsisted on a pound of wheat daily, which they ate in that form or crushed and cooked. Occasionally the former got a little wholemeal as a luxury.

Taking a leaf out of the book of these very vigorous, robust, and brave people, who were able to endure hardships unknown to the soldiers of the present day, what can be more delicious, stimulating to the intestines, and capable of affording everything required for nutrition and health, than crushed wheat made into porridge or eaten with milk ?

It is very cheap and infinitely better food than

the vast majority of faked foods now in the market. It has also the advantage of being very tasty and appetising.

SIXPENCE A POUND

A parent, however limited her circumstances, can feel assured that if she provides her child with a large basin of these materials for breakfast it will provide a most efficient and health-giving diet, and at about sixpence a pound. In this way the difficulties of obtaining real wholemeal bread will be avoided.

The wife of a policeman informed the baker from whom she bought the rolled wheat that she found that one pound of the wheat went as far as two pounds of oatmeal and was much more appreciated by her children.

The porridge may be made more attractive and varied by the occasional addition to it of a quantity of raisins or currants. Currants can be obtained at a very small cost. They are most nutritious.

SCARING THE PUBLIC

Numbers of correspondents state that they experience insuperable difficulty in obtaining wholemeal bread, in spite of the efforts which the *Daily Mail* has made to impress on the public the hopeless insufficiency of white bread and the fact that wholemeal bread is a perfect food.

Some bakers frighten their customers by telling them that any rubbish is put into wholemeal bread and that the materials that have been abstracted from the wheat in order to produce the bleached ghost of white flour are fit only for pigs and cattle,

and that for centuries they have been allocated to that purpose.

Doubtless this question will be decided by the health authorities publishing a definite statement on this subject in a more popular manner than they have done up to the present. Such a statement on wholemeal made in the daily press by Sir George Newman, as representing the authority that is placed by the Government in control of the food of the people, would do a great deal to enlighten the community and also to control the propaganda now being broadcast by those interested financially in perpetuating the use of white flour and white bread.

CHAPTER XXIII

HOW TO BENEFIT FROM YEAST

I HAVE been inundated with inquiries as to the best way to use yeast extract, the dietetic advantages of which I described in an earlier chapter.* To satisfy these with additional authority I have asked Professor R. H. A. Plimmer, D.Sc., Professor of Chemistry in the University of London at St. Thomas's Hospital Medical School, to supply the information desired.

He has furnished me with the following authoritative statement for the benefit of those interested in the use of this valuable article of diet.

By the immense quantity of correspondence which reached me during the course of the health articles that were published by the *Daily Mail*, I am able to judge of the very great benefit which the public is deriving from the information thus supplied to it.

YEAST AND HEALTH

By PROFESSOR R. H. A. PLIMMER, D.Sc.

Yeast is used for making beer and for making the dough rise in the baking of bread and cakes. Yeast is a tiny living plant, and millions of these little plants are contained in an ounce of yeast.

The yeast plants grow and increase in number

* See Chapter XI.

rapidly during the brewing of beer ; in fact they multiply to such an extent that formerly the excess of yeast was considered to be a waste product and was thrown away.

Chemical analysis, however, revealed that yeast is a valuable food. Dried yeast was found to contain twice as much protein as beef or mutton. Farmers began to use it for feeding live stock and with excellent results.

RICH STORE OF VITAMIN

Modern scientific work has proved that the chief dietetic value of yeast is in connection with its rich store of vitamin B. This vitamin can be easily extracted and prepared in a concentrated form, making a food which in large measure compensates for the vitamin B that has been removed from white flour in the process of milling.

Concentrated yeast extract is now a commercial article of food, and is sold under the name of Marmite. During the war Marmite was used largely for our troops in Mesopotamia as a source of vitamin B. In the "Official History of the War," Volume II., the following statement appears :

"Marmite is a pure extract of yeast made by submitting brewers' yeast to a special digestive process. The resulting product is almost indistinguishable from extract of meat. It has the distinct advantage over yeast that it remains practically unchanged even when exposed to the air in tropical climates, while yeast preparations deteriorate and in some cases undergo putrefaction-changes."

Life cannot be maintained without an adequate

supply of vitamin B. The absence of this vitamin from the food has caused thousands of deaths from beri-beri in the Far East, and the disease has been prevented by eating foods rich in this vitamin.

CHRONIC ILLNESS

In this country there are no deaths from beri-beri, but many people suffer chronic illness as the result of too little of this vitamin in the food. A connection between constipation and consequent colitis, chronic appendicitis, and innumerable other digestive troubles and diseases consequent on them, is now being traced to the smallness of the amount of vitamin B in the food.

This condition arises from the excessive consumption of white flour, sugar and meat, foods which contain no vitamin B. This shortage of vitamin B is easily overcome, as was shown on a large scale during the war, by a daily addition to the food of small amounts of Marmite. The best way of taking Marmite is either as soup or spread upon bread to make sandwiches. It can be taken at any time of the day to suit individual convenience.

CHAPTER XXIV

VALUE OF EGGS AS FOOD

A LARGE number of correspondents have written to inquire as to the value of eggs as an article of diet.

While eggs are eaten in various forms by a very large proportion of the community, many state that they have been informed that they make people bilious, and that they produce a number of ailments, some of a serious character.

It is possible that a very small number may have an idiosyncrasy that renders eggs an unsuitable food for them, but such is usually the result of a defective action of their digestion, producing a stagnation of the contents of their intestines.

If the public can be made to realise what an important part eggs can play in diet many more would be enabled to adopt the poultry industry, with great advantage to themselves and others.

In order to place this matter clearly before the public, Dr. J. L. Rosedale has furnished the following report, which is replete with interest :

MILLIONS OF EGGS

By J. L. ROSEDALE, D.Sc.

Eggs are probably more widely used in the general household than any other article of diet except bread. During 1925 our imports of eggs

in the shell amounted to about 2,500 millions, which alone provides for a consumption of about seven dozen eggs per head of the population. To this must be added about an equal quantity of home-produced eggs and about 150 millions which are imported as powders for culinary and manufacturing purposes. In energy value this could represent enough food to keep two million people for a single day.

But the value of eggs is by no means confined to their energy or fuel value, for as such they would not constitute an economical food. They are essentially classed among the "meat" foods, for slightly more than a tenth of their weight is composed of a variety of different proteins, thus furnishing valuable tissue-building food.

With these proteins are mingled such fatty materials as lecithin, which supplies phosphorus in a form available to the body. Other mineral substances of importance are found mainly in the yolk, which carries also its quota of vitamin B and the fat soluble vitamin.

MOST USEFUL FOOD

It will be seen, therefore, that an egg provides a number of materials of vital importance to our daily diet, and the numbers of ways in which it may be employed in the preparation of food doubtless cause the egg to exceed the general utility of any other food.

While methods of preservation of foods are gradually being perfected, it cannot be denied that it is desirable to eat fresh food as far as possible. To this end the Government, through the Ministry of Agriculture, has in recent years done much to

establish the egg industry on more satisfactory lines. These efforts should gradually help in saving the country £18,000,000 a year.

Probably few industries are so widely distributed as the British egg industry. The industry itself has provided a considerable amount of the money needed for the establishment of the Research Institute in Poultry Husbandry which was opened by the Duke of York some time ago.

This keenness on the part of farmers and poultry keepers has been largely stimulated by the *Daily Mail* and the National Utility Poultry Society, which have for many years supported the famous laying tests at Bentley, Suffolk. These have proved that British poultry is no exception to British stock in general—the best in the world.

Farmers are rapidly improving their methods of marketing, and the aspersions which have been cast upon the British egg by importers and others are fast dying out. Eggs form a satisfying substitute for meat, and at the same time supply a greater variety of the dietary essentials.

CHAPTER XXV

SOME VALUABLE VEGETABLES

FOOD VALUE OF POTATOES

By PROFESSOR R. H. A. PLIMMER, D.Sc.

It is not widely enough realised what a splendid article of food the potato is. Experiences from many parts of Europe have proved its value. In conjunction with milk or eggs, potato makes a complete diet, supplying all the material that the body needs. Such a diet has been the staple food of many Irish peasants of fine physique, whose children are free from rickets.

Dr. Hindhede, the director of the Laboratory for Nutrition Researches in Copenhagen, carried out experiments on three men for periods of three, eleven, and sixteen months, and found that they kept in good health on a diet containing nothing but margarine and potatoes flavoured with onion.

He also observed that a diet of potatoes, *including* the water in which they were cooked, had the effect of dissolving uric acid from the tissues and of relieving the troubles which the retention of this poisonous substance causes. During the war a greatly increased amount of potato was eaten in Denmark, and at this period the death rate fell to the phenomenally low figure of 10 per 1,000.

Chemical analysis shows that the potato consists of three-fourths of water, one-fifth starch, one-fiftieth of protein, and one-hundredth of mineral salts, with traces of fat. There are many other foodstuffs which, judged from the chemical analysis, would appear to have a higher nutritive value, but the special value of the potato is due to the vitamins which it contains.

PREVENTS SCURVY

The potato has long been recognised as a preventive of scurvy, that fatal disease which develops if the diet contains no vitamin C. A daily quantity of 7 oz. of potato, cooked for fifteen minutes, will protect a man from scurvy. Our fruit imports were small during the war, and the failure of the potato crop one season led to a great reduction in the available supply of foods rich in vitamin C. In some of our large towns there were outbreaks of definite scurvy.

The readiness with which people succumbed to the great influenza epidemic which followed finds a probable explanation in a general state of lowered vitality consequent upon a deficient supply of vitamins, due in part to the potato shortage.

Sir Thomas Barlow many years ago demonstrated the value of potato in preventing and curing infantile scurvy. The practice of adding freshly boiled, sieved potato to a baby's bottle, instead of some white starchy or malted food, has much to recommend it.

The vitamin B value of potatoes is still insufficiently recognised. In comparison with whole-meal flour and yeast the amount of vitamin B in potato is small, yet it is of considerable practical

importance, as ten and more ounces of potato are often eaten daily.

CHECKS BERI-BERI

Beri-beri, the disease caused by the absence of vitamin B from the diet, developed among our troops on active service in the East during the war, on a diet which was practically identical with the every-day diet of this country, except that it was lacking in eggs and potatoes.

From this experience the value of potatoes for supplying vitamin B may be deduced. Direct experiments also confirm the correctness of this conclusion.

The popular belief that the special food value of potatoes is in some way connected with the skin probably arose because the skin and outer layers of wheat and rice are the most nutritive part of the grain, and the same was assumed to be true of the potato. The potato is not a seed and there is no evidence that its skin has any special value. Potatoes cooked in their jackets are more nourishing because the skin prevents the washing away of vitamins and salts into the cooking water.

Many people limit the amount of potatoes they eat because they are afraid of becoming fat. The process of getting fat indicates that more food is eaten than is being worked off in muscular energy. There is no reason to blame the potato, but the total amount of food should be reduced, especially sweet and fatty foods.

A smaller consumption of white flour, sugar, and meat, and a larger consumption of potatoes would materially increase the health of the nation.

Unfortunately this winter* we again have the prospect of a shortage of potatoes owing to a poor crop.

CELERY

By DR. S. G. WILLIMOTT

Celery is one of the most esteemed vegetables and also one of the most serviceable. It is employed by the confectioner, who decorates his fancy cakes with sugared strips of celery in the form of angelica, as well as by the wise housewife who uses it freely in her salads and soups.

Chemical analysis reveals the fact that celery, in common with the fruits and vegetables, contains little of the chief principles, protein, fat, or carbohydrate, of a normal diet.

Its virtues are to be found rather in its rich and varied content of minerals, in its high reserve of vitamin B, and probably also in the presence of other little known constituents. The mineral reserve in celery is particularly valuable because of its basic nature when burnt in the body. This helps to neutralise the acidity of the meat and bread portions of our diet. Appreciable amounts of calcium, magnesium, potassium, manganese, and iron are found in the ash of this plant.

A PROTECTIVE FOOD

The presence of vitamin B is of special importance in view of the increasing belief of many authorities that the average diet is apt to be deficient in this vitamin factor, and that there appears

* 1926-1927.

to be some relation between the quantity of food eaten and the amount of vitamin B required to turn it to full account in the body. The flavour of celery appears to be due to the presence of an odoriferous aromatic oil. The seeds of the plant are regularly used as a flavouring agent.

A valuable characteristic of raw celery is its influence in stimulating elimination of the waste products of the body. On this account alone its presence in the diet is desirable. Experience also seems to show that the consumption of celery by persons afflicted with rheumatism is very often beneficial. No one at present is prepared to say how the plant is able to exert this remedial action, but most of us will probably content ourselves by using this excellent vegetable as a protective food.

THE ONION FAMILY *

By DR. S. G. WILLIMOTT

The onion, leek, shallot, garlic and chives form a group of vegetables long esteemed as human food. Of these the onion is easily the most important, and hence the most largely cultivated, and has been appreciated for its food value and medicinal qualities since the dawn of authentic history. Its original home was probably in Southern Asia or the countries about the Mediterranean. Several varieties were known to the Greeks and Romans, while in Egypt it was largely consumed and even accorded divine honours. In our own country, it was used by the priests in the rites of druidical worship. Although the onion has

* This section has not been published in the *Daily Mail*.

fallen from its once high spiritual state, its material advantages are just as much appreciated to-day as they have been throughout centuries of human history.

Considering its extensive use as food, it is not surprising to find the onion widely cultivated and adapting itself to the most varied climates. It is grown readily from seed in spring or autumn and appears to do better in a soil containing a quantity of soot and common salt. Onion fly is the chief danger to be avoided. Onions grown in warm climates, like that of Spain, are sweeter and of milder flavour than are our home-grown varieties. Provided it is kept in a dry, airy place and protected from frost, the onion can be stored without fear of decomposition for long periods. It is thus made available all the year round and is cheap enough to be within the means of everyone. Its good keeping qualities are responsible for its use in the rations of armies operating at great distances from their bases. The cultivation and export of onions, chiefly to Great Britain, constitutes an important industry in itself in Spain, while in the United States, where the onion is the third largest truck crop, large numbers have still to be imported from Bermuda to meet the home demand.

Onions can be consumed in almost any form, either raw, boiled, fried or roasted. Some who find its strong odour disagreeable in the raw state often enjoy it when fried or boiled. In whatever form it is eaten, the onion is a great appetiser and is probably used more than any other vegetable for the flavour it imparts to other food.

All members of this family contain a biting volatile oil, of which allyl sulphide is one consti-

tuent, to which its characteristic properties are due. About 12 per cent. of nutrients are usually present in the onion, and these include the sugars, glucose and fructose, an insignificant amount of protein, and a little citric and phosphoric acids in the free state and also combined with potassium, sodium, magnesium, calcium, silicon and iron. The onion is also a useful source of vitamins B and C, particularly when fresh spring onions are used in the raw state, as in salads. Of the remaining members of this group, garlic, which finds most use in Southern Europe, has stimulant and tonic properties.

Shallots and chives are largely employed in the preparation of pickles.

Still another valuable property enhances the reputation of the onion in popular esteem. Taken either raw or as gruel, the onion is in high repute as a remedy for colds and chills, and more important still, of being efficacious in arresting chills when their onset is threatened. Undoubtedly, different persons respond in different ways and in different degrees to such preventive measures but the action of onions in the cure of winter colds must be accepted as a well-known, though as yet an entirely unexplained, fact.

THE TOMATO *

By DR. S. G. WILLIMOTT

It is probable that the tomato is the most valuable of the home-grown fruits. At first it was

* This and the following section are appended to this chapter as containing useful information concerning two valuable fruits.

extensively grown as a decorative plant, but the realisation of its value as an article of food has been comparatively recent in England.

The cultivation of the tomato under glass has developed so rapidly that it now constitutes an important industry of its own.

Chemical analysis alone affords little clue to the real food value of the tomato. It is richest in carbohydrates, but like most fruits and vegetables is unimportant as a source of fat or of the flesh-forming constituent called protein. Its fuel value is low.

Why, then, is the tomato so much esteemed? The answer lies in its high content of the vitamins. In its store of vitamin C—which wards off scurvy—it is the rival of the orange and has, in fact, been used successfully as a cheap alternative to orange juice in infant feeding.

It has also been established that by the application of proper methods of processing tomatoes may be canned apparently with little destruction of their anti-scorbutic value. The consumption of the raw fruit is always sounder, but in special circumstances such preparations have their uses.

In addition to vitamin C, tomatoes also contain considerable amounts of vitamins A and B, which fortify the total vitamins in the diet.

THE CANCER FALLACY

The belief that tomatoes contain oxalic acid is incorrect, the chief acid present being citric acid, a natural constituent of fruits. The flavour of the fruit is due to its sharp volatile oil. Small amounts of certain minerals are also present. The idea, once popular, that the consumption of tomatoes is

liable to cause cancer is without scientific justification, and is, perhaps, an illustration of how wide of the mark popular opinion on food and nutrition can sometimes be.

To the housewife the tomato is estimable as a salad material in the raw state, or for the flavour it imparts when fried or boiled in soups and sauces. But it is in the raw, untampered state that it does most good. Here we may well follow the practice of our Continental friends, who consume considerably more raw salad than is customary with us, to their great advantage in health and happiness.

Raw tomatoes as an ingredient of green salads are a cheap, concentrated source of the principal vitamins within the reach of all.

NUTRITIVE VALUE OF NUTS

By DR. S. G. WILLIMOTT

Compared with fruits generally, nuts are of much greater value to the food manufacturer because of their concentrated nature, their energy value being at least twenty times greater.

Because of their concentrated make-up nuts have been popularly supposed to be difficult of digestion. The careful observations of Professor Jaffa on fruitarians in California, however, have shown quite definitely that nuts are not specially resistant to the digestive functions, and, if used in the diet with due regard to their concentrated nature, constitute valuable human foods.

Four main factors are responsible for the impor-

tant position nuts should occupy as food—namely, their high content of protein, great richness in oil, the presence of vitamin B, and their store of several of the minerals essential to life. The flesh-forming constituent, called protein, accounts for about one-fifth of the weight of the edible portion of nuts. The chestnut appears to be the only notable exception, which, though poor in oil and protein, is unique in that half its weight is due to starch.

ALL THE ESSENTIALS

Actual feeding experiments have shown that the proteins of the almond, English walnut, filbert, coco-nut, pea-nut, and Brazil nut are of high biological value. In short, nuts provide what is known as “good” protein—that is, protein which can supply all the necessary bricks in right quantity required for the building up of a healthy body.

Nuts have long been valued for their oil, which usually comprises from half to two-thirds of their weight. Their fuel value is consequently high. In view of their rich oil content the presence of fat soluble vitamins might be expected. Unfortunately, experiment has not realised this conjecture, all the edible nuts tested having proved to be poor sources of vitamin A. Vitamin C, the anti-scorbutic factor, also is probably absent. It is in their rich store of vitamin B that we must regard nuts as a source of the vitamins.

CHAPTER XXVI

THE TRUTH ABOUT SUGAR

WE have received a bulky correspondence in reference to the use of sugar as an article of diet.

Some inquirers state that their medical advisers have urged that they should cut out sugar from their dietary, while other doctors have advised that the more sugar they and their children eat the better.

To meet this divergence of opinion, Professor Plimmer has supplied the following article, which will afford the reader just the information he requires on this most important question :

SUGAR

By PROFESSOR R. H. A. PLIMMER, D.Sc.

Ordinary sugar, whether brown or white, is not a natural foodstuff, but a purely artificial product. The development of the beet-sugar industry has led to a huge production at a cheap price, with the result that the quantity of sugar consumed per head in this country is thirty times as great as it was a hundred years ago.

The sweetest natural food is honey, which contains about 70 per cent. of sugar. Some fruits have as much as 17 per cent. of sugar, but most fruits only from 5 to 10 per cent. Dried fruits like currants, dates, and figs contain from 40 to

60 per cent. of sugar. The sugar cane and the beet, from which sugar is commonly extracted, contain from 12 to 20 per cent. of sugar. Cane, beet, maple, and palm sugar are different commercial products, but chemically they are all the same kind of sugar, *sucrose*.

Chemically, we distinguish several kinds of sugar—grape sugar or *glucose*, fruit sugar or *fructose*, malt sugar or *maltose*, milk sugar or *lactose*, the last scarcely sweet to the taste. These sugars, together with starch, found in cereals, potatoes, sago, and so on, are classed in the same chemical group, the carbohydrates.

SIMPLE AND DOUBLE SUGARS

All carbohydrates are essentially of the same chemical composition and vary only in complexity. Glucose, fructose, and galactose are simple sugars. Sucrose, maltose, and lactose are double sugars. Starch is a multiple sugar. Thus, sucrose is made up of glucose and fructose, lactose of glucose and galactose, and starch is a combination of glucose with itself many times.

As food all the different sugars and starch are of the same value. During digestion, the complex sugars and starch are all resolved into the simple sugars of which they are made. They are fuel foods and have the same fuel value. They simply burn in the body and give rise to heat; 1 lb. of sugar or starch gives some 1,800 heat units or calories, and provides about two-thirds of the total heat units of the average daily requirement.

The common idea that glucose is an inferior form of sugar is erroneous. It has the same value as other sugars. Glucose is the ordinary sugar

present in the body, and normally found in the blood to the extent of about 0.1 per cent. In diabetes there is more glucose in the blood because the body has lost its power of burning sugar ; the excess is excreted by the kidneys.

MISTAKEN BELIEFS

Sugar and starch are simply foods of good fuel value. If eaten in excess of the energy requirement of the body they are changed into fat and stored in the tissues, thus creating the wrong impression that the individual is well nourished.

Artificial sugar and white flour do not contain vitamins or mineral salts, both of which are essential to health. A daily quantity of each vitamin is needed ; especially vitamin B to help in the digestion of carbohydrates. A diet consisting mostly of sugar and white flour provides too little vitamin B, and causes heart trouble, constipation, and gastric disorders. Carbohydrate in its natural form in fruits and wholemeal is accompanied by enough vitamin B.

The belief that brown sugar is better than white is wrong, and the claim that honey contains vitamins is not supported by scientific experiments.

CHAPTER XXVII

FACTS ABOUT MEAT

A LARGE number of native races avoid eating animal food of all sorts, and are certainly more athletic, robust, and healthy than the members of civilised communities who live on a diet which consists largely of flesh in one form or another.

It is perhaps unnecessary to insist on the fact that *those races who live on a non-animal diet are healthier and capable of expending more energy than are those who live largely on flesh.*

It is quite open to anyone to assert that, while this is true in the case of the native existing in his normal surroundings, it does not apply to the white man living in a state of civilisation.

As an illustration of the fallacy of such a belief we know that Wellington, though hard pressed for men, took none under 5 ft. 5 in., and every man had to have perfect eyesight and perfect teeth. These men, before they enlisted, had been brought up on hard wholemeal bread, garden produce, and practically no meat. While serving they received 1 lb. of wheat a day, which they ate as it was or pounded up to make a coarse bread, and with a scanty quantity of wholemeal flour if it could be obtained.

Quite a large number of people have long excluded animal food, other than dairy produce, from their dietary, with most marked benefit to their physique and health.

PUTREFYING FOOD

The explanation of the advantage which this diet afforded to them is perfectly simple. Owing to our habit, which is practically universal in civilisation, of damming back the products of digestion in the large bowel, simple and obvious mechanical changes take place in the entire gastrointestinal tract, perfectly analogous to those which ensue in the drainage scheme of a house when the outflow from the cesspool is controlled by grease and other obstructions.

There is also associated with this mechanical obstruction an ascent from the large bowel of harmful organisms, which then invade and grow on the contents of the small bowel. These contents are the digesting and digested food from which the tissues of the body derive their nourishment.

The extent of the infection of the food in process of digestion in the small intestine determines the amount of poisons absorbed into the circulation. As a large proportion of the people suffer from such a condition, it is clear that great benefit would inevitably result if all such food capable of producing deleterious matter when brought into immediate contact with the agencies which produce putrefaction were discarded.

On the other hand, grains, fruits, vegetables and dairy produce placed in the same conditions do not develop deadly poisons, and are therefore not harmful. One is familiar with the fact that a single sardine or one anchovy which has been infected by these same agencies before being eaten can terminate the existence of the individual

in a few hours, while foods such as cheese may be kept indefinitely without becoming poisonous.

Most vegetarians realise that constipation and decomposition and fermentation of their food, and the gas formation which results, are all lessened most materially by the avoidance of all animal food, with infinite advantage to their health and well-being and happiness.

CHAPTER XXVIII

SUNLIGHT

FROM time immemorial men have worshipped the sun and instinctively sought life and healing from its wonderful rays. Modern science has more than confirmed that intuitive belief, for it has proved that the promotion of health and the prevention of disease can be very materially furthered by a proper use of natural or artificial sunlight.

On this important subject, Dr. C. W. Saleeby, one of the founders of the New Health Society and chairman of the Sunlight League, has written the following statement for this series :—

SUNLIGHT THE HEALTH GIVER

By DR. C. W. SALEEBY, F.R.S.E.

Most of our diseases are caused by microbes or "germs," as Pasteur showed in the 'sixties of last century. In the 'seventies two Englishmen, Dr. Downes and Mr. Blunt, who still lives in Shrewsbury, found that sunlight is a germ-killer or antiseptic. It is, indeed, the best, the first, the safest, cheapest, and most widely useful of all antiseptics, and the only known antiseptic which, unlike carbolic acid or any other that can be named, strengthens the body while killing the body's foes.

Thus the first extensive use of sunlight as a

healer in modern times was to kill germs that attack the skin, and especially the germs of tuberculosis.

In this country we usually have to invent artificial lamps as substitutes for sunlight, but that is a later story to which we must return.

Even before the experiments of Finsen, in Copenhagen, an Englishman had found that wherever children get plenty of sunlight they have no rickets, and *vice versâ*. He made his great discovery in 1890 and published it in the *Practitioner* in that year; but no one took any notice of it, until I was fortunate enough to have my attention drawn to his paper when I was studying this subject in the United States a few years ago.

DISEASES OF DARKNESS

The true discoverer of the profound and simple truth that sunlight cures rickets, *and prevents it*, is not Huldchinsky, of Berlin, whose discoveries attracted attention in 1919, but Dr. T. A. Palm, whose work was done in 1890. In this field Britain bears the Palm. Our veteran pioneer, now nearly an octogenarian, still practises in Kent and has lived to see his discovery, made nearly forty years ago, acclaimed everywhere.

And then there is Dr. Rollier, of Leysin, in Switzerland, who ever since 1903 has been curing thousands of cases of so-called "surgical" tuberculosis without the knife by giving them baths of the unsullied sunlight of the Alps, rich in the ultra-violet rays of which the pall of smoke above our crowded cities murderously deprives us.

Only fools look for panaceas, and sunlight is not one; but it is more nearly a cure-all than any

drug or other agent on earth or in the sky. It has specific powers against tuberculosis and obesity, against rickets and baldness, for instance ; a wide range, indeed. Its re-discovery in our day is nothing less than the sunrise in medicine. And when we learn this we begin to see that sunlight should be used in health to prevent what I have called the *diseases of darkness*.

MAKING SUNLIGHT

In this country sunlight is often lacking, and therefore we must invent substitutes. They should be kept in their place, which is that of second-bests, and we should first seek to use all the sunlight we have.

In broadcast lectures and otherwise I have urged our seaside resorts to make sun bathing available, as it is at so many places on the Continent, where the traveller on the Rhone and the Danube, on the Lake of Geneva and the Mediterranean, finds places fitted out for sun bathing where formerly only water bathing was provided for.

We have no mountain in the British Isles as high as Leysin, in Switzerland, but the next best place to the mountains is the sea, where much ultra-violet light is reflected from the water.

We do not yet use our coast-line as we should and must. Not yet may girls and boys use even the Serpentine for the three kinds of bath that every child should have—baths of water, baths of air, and baths of light.

THE NEW GLASS

And that is only one of innumerable instances. We must also use the new glass for our homes and

schools and hospitals. This is the Vitaglass invented by Mr. F. E. Lamplough, M.A., following an appeal of mine in *Nature* for a cheap substitute for the costly quartz which we have to use in certain artificial lamps, because it allows the ultra-violet rays to pass, as ordinary glass does not. Vitaglass has proved very successful at the Zoo, as every one knows.

Finally, we must provide hospitals and clinics and sanatoria, and private doctors too, with one or more of the types of lamp which emit enough ultra-violet radiation to act as partial substitutes for sunlight. The innumerable uses of these lamps in the treatment of disease are not, of course, our concern here. But naturally we ask whether they cannot serve to compensate us, at least in part, for our deplorable shortage of sunlight, and to help us to solve the problem of how to live through the winter.

They can and must be used, and the work has begun. It has proved consummately successful at the Zoo in recent winters, for many kinds of monkeys and other animals ; and again I repeat the question : If these discoveries are used now for chimpanzees, when are they to be used for children ? Are children not worth " a wilderness of monkeys " ?

In these very brief notes it is impossible to describe the types of lamps now available and their relative merits and applications. For some years past I have used one—of the " mercury vapour quartz lamp " type—beside my bed for the various members of my household, and we should all be very sorry to be without it now.

And for some time past we have also used the

lamp to radiate the milk we consume—the milk too often of light-starved cows. Huge fortunes doubtless await the pioneer manufacturers who can supply our light-starved millions with properly radiated food.

BANISH THE SMOKE

Since sunlight can cure so many diseases, even in cases otherwise far beyond hope, evidently it can prevent them. Heliotherapy—the sun-cure—teaches us to rise to helio-hygiene, the use of sunlight for health; for the prevention of the diseases of darkness, and for the enhancement of all our bodily and mental powers.

In Naples they say that “where the sun enters the doctor stays outside.” But in our crowded and smoky cities we are starved of sunlight and hence, especially during our winters, all who can take the Blue Train to the blue sky flee the darkness that can be smelt in our cities of dreadful day. The rest must take their chance, and it is poor enough.

Our duty is evident. Half a century ago a wise statesman, Disraeli, of the same race as that mighty sanitarian, Moses, restored pure water to our cities. His half-witted political opponents ridiculed his “policy of sewage,” as they contemptuously and contemptibly called it. They deserved to die of typhoid and dysentery and the rest of the water-borne diseases, which the Public Health Act of 1875 most gloriously suppressed in spite of their despicable gibes.

And now the time has come to restore pure sunlight and air to our cities—in which four-fifths of us live—and thus to abolish the diseases of dark-

ness, as I call them. There is nothing the matter with cities as such ; but we should be urbanised rightly. Hence my dictum of many past years : *The restoration of sunlight to our mal-urbanised millions, now bleached and blackened and blighted in slums and smoke, is the next great task for public health in our country.*

A few weeks ago the Public Health (Smoke Abatement) Act, 1926, was added to the Statute Book. It comes into force on July 1, 1927, and I take the opportunity afforded by the timely publication of this volume to urge upon all local authorities their duty of administering the Act to the utmost. At least it recognises the principle of seeking to reduce the factory smoke which helps to destroy us.

Next we should resolve never again to build anything for human habitation—not to mention cows and horses, by the way—not a house nor a school nor a hospital, without contriving in structure and in equipment to admit the Light of Life.*

* See for further study of this subject, Dr. Saleeby's book, "Sunlight and Health" (Third Edition, 1927, 5/- net, Nisbet & Co.).

CHAPTER XXIX

MORE SENSIBLE CLOTHING

PERHAPS there is no subject on which people differ more than on that of the nature of the dress that should be worn at various times of the year.

Just as many very worthy housekeepers use fires and make other changes in the home at a fixed date, without any regard for the temperature of the air, so many men discard the clothes they are accustomed to wear in summer and replace them by much heavier garments in winter.

It is well to remember that our climate is subject to great and most abrupt variations in temperature, a condition which those living more constantly under the sun do not experience.

EXPOSURE TO AIR AND LIGHT

On general principles the more one's body is exposed to light and air, the better for one's health, since the skin derives all the advantages which the rays of the sun afford and the ventilation which the free access of air supplies. Many consider that the same clothing should be worn at all times of the year, and that overcoats are sufficient to meet the lower temperature of winter when out of doors. In proportion as it is cold so a thicker covering can be worn, extending to a leather coat in an open car.

In this way air has free access to the skin while

in the house, so helping to eliminate such moisture and effete products as are discharged from it. Again, the lighter clothing enables and tempts one to get about and to lead a more active life than do the abundant thick garments that used to be worn even indoors.

The whole principle of wrapping up is utterly wrong. During the cold weather it is wise to eat more than in summer, in order that the temperature of the body shall be maintained at a normal level. The simplest of foods are best suited to this purpose, and the less they have been damaged by heat or by the addition of chemical agents, or by the extraction of factors of vital importance to health, the more useful they are.

WOMEN'S EXAMPLE TO MEN

The women of the present day are much wiser than the men, since by habit they have accustomed themselves to wear a minimum of clothing. Indeed, the extent of the new tendency is only limited by the jealous criticism of their fellows of mature age. A certain amount of covering is necessary for their bodies, not only for purposes of decency, but also to render their form more graceful and attractive than Nature has made it and also to afford colour.

Dressing must be controlled by these considerations and conventions. It is well to remember that the extent of the body which it is customary to expose to the sun and air is ruled largely by custom. Only a little time ago any exposure of an ankle evoked the severe criticism of sundry matrons and the admiration of their male friends. At the present time it would be difficult to define

exactly how much of the body can be exposed to view and the degree of transparency of the garments which, with propriety, should cover the balance.*

With all this, women are at a great advantage as compared with men, since common-sense and experience show us that the less we cover up the body and the lighter the covering the more robust and healthy it is, and the better able to resist change in temperature and the invasion of organisms of all sorts.

Women are infinitely less the slaves of fashion than men, and they display a marvellous capacity, almost chameleon-like, in struggling to appear to the greatest advantage and to enjoy a vigorous, healthy life.

With all this supreme effort on their part, men complain and criticise them, when they are doing their utmost to please them by making life gay and bright for them, and by discarding the gloominess, frowsiness, and dullness of the Victorian age. They have all our sympathy, respect, and admiration.

* A special Clothing Committee has been appointed by the New Health Society, assisted by distinguished scientific experts on textiles, to investigate and report upon the best forms of clothing materials for health.

CHAPTER XXX

SMOKING

By DR. LEONARD WILLIAMS

It may legitimately be claimed for tobacco smoking in strict moderation that it is possessed of at least two merits. The one is that it is a sedative to the nervous system ; the other, that by reason of the formalin which the smoke contains it is an antiseptic to the air passages.

Of the first of these there can be no reasonable doubt.

In the matter of the second claim some doubt is permissible. If a power to repel microbes really resides in tobacco smoke, the degree of this power must be almost negligible. Owing to the large number of women who have taken to the habit smoking has increased enormously during the last few years, especially in certain classes, and yet three diseases, all of which are believed to be caused by the entry of a microbe through the air passages, have been riotously epidemic. These diseases are influenza, infantile paralysis, and sleepy sickness.

The other side of the medal is provided by the fact that tobacco is a definite poison. It is, however, one of those poisons to neutralise which most people very readily produce anti-bodies, as they are called. This, however, is not true of everybody. There are some persons who cannot

tolerate tobacco in any form, and even among those who can the tolerance appears to be selective in the sense that they can tolerate tobacco in one form but not in another.

There are some, for example, who can smoke pipes but not cigars, others who can smoke cigarettes but not pipes, and so on. It used at one time to be said that cigarettes were particularly harmful on account of the paper. This is now recognised to be pure nonsense. The only charge which can legitimately be brought against this form of smoking is that the cigarette, owing to its ease of general manipulation, is more likely to lead by degrees to excessive smoking than either pipes or cigars, but even here the evidence is far from convincing.

EYESIGHT

Intolerance of tobacco may lead to a great many very unpleasant conditions, the most serious among which is blindness. This is an affliction which entails immediate and permanent cessation of tobacco in every form. It used formerly to be thought that women were exempt from this manifestation of intolerance. So far from this being the case, it has recently been shown that women acquire the disease at an earlier age, with the use of much less tobacco, and in a very much shorter period of time than men.

CHAPTER XXXI

WONDERFUL IODINE

It is the earnest endeavour of the New Health Society to teach people how to avoid disease and ill-health by right diet and habits.

Wrong diet and wrong habits have brought about the only too familiar diseases of civilisation, the most prominent among them being what are called "deficiency diseases," such as rickets, scurvy, and beri-beri, due to the lack of certain of the vitamins in the diet of the sufferers. One of the most recent discoveries is that goitre must be added to the list of these deficiency diseases and that it is due to lack of a wonderful element—namely, iodine.

IODINE AND HEALTH

By DR. C. W. SALEEBY, F.R.S.E.

The science of diet has recently discovered five vitamins, minute traces of which are necessary for the health of the individual and the race.

- A, which promotes growth and protects against tuberculosis ;
- B, which promotes growth and maintains the health of the nerves ;
- C, which protects against scurvy ;
- D, which prevents or cures rickets ; and
- E, the recently discovered fertility-vitamin, which is necessary for parenthood.

Sir Gowland Hopkins, of Cambridge, the great pioneer of these discoveries, has suggested that some, at least, of the vitamins act upon and through the ductless glands.

Of these ductless glands or endocrine organs, the chief is the thyroid gland in the neck—"the leader of the endocrine orchestra." And now we learn that, besides the vitamins, we need also small quantities of a long-familiar, inexpensive, simple chemical element called iodine, in order that the thyroid shall do its varied and priceless work for the individual and the race.

AN ESSENTIAL SALT

When, therefore, we very properly mention the mineral salts as necessary in our food, we must particularise; and just as we say that sodium chloride, or common salt, is necessary as a source of the hydrochloric acid which the stomach secretes for digestion, and as an aid to many other vital processes, so also we must say that a very similar salt, sodium iodide, or its equivalent, is necessary for the work of the thyroid.

In a sense, iodine offers a much simpler problem than the vitamins. How they act no one knows; but iodine is simply a necessary raw material for the construction, by the thyroid, of its unique product thyroxin, without which none of us would be here. Lacking thyroxin, the body and the mind cannot grow; and if they be already grown, they degenerate and perish. The results of thyroid inadequacy are a theme for volumes; here we need merely mention such diseases as myxœdema, cretinism, some forms of obesity,

and an exceedingly common disease of the thyroid gland itself, called ordinary or endemic goitre.

Once we know that the thyroid must have iodine in order to do its work, we naturally ask whether thyroid failure and its myriad consequences in the gland and throughout the body may not often be due to shortage of iodine in the food supply ; or in the intake of the body—for the iodine will serve if it be in the water we drink or in the air we breathe or even if it be rubbed into the skin. And indeed this is so.

First, in one of the most goitrous parts of the United States, just a decade ago, soon thereafter in terribly goitrous Switzerland, and later in many other parts of the world, it has been found that the restoration of small quantities of iodine to the bodily intake serves to cure many goitres and to prevent far more—just in the fashion in which the vitamins cure and prevent the disorders with which they are associated. A safer, simpler, cheaper, more widely useful discovery in medicine and in hygiene was never made, as we shall see.

HOW TO USE IODINE

There are many ways in which we may supply ourselves with the necessary quantities of iodine for use by the thyroid gland. When we go for a holiday to the sea, for instance, we gain a little iodine from the air, impregnated with wind-borne spray from the sea.

Then we must examine our usual food, and learn where we may hope to find iodine. We may find traces in wholemeal bread ; but we shall find none in white bread. Marine foods are the most

likely to serve us, of course ; and of these cod-liver oil, if we accept that as a food, is easily the first.

And we might well expect to find iodides—salts of iodine—mixed with the chlorides—salts of chlorine—in the salt we use for cooking and at table. But in this we shall be disappointed, for, in fact, the artificial purification of this product, and the manufacture of a perfectly pure and gleaming white preparation, involves the removal of the precious iodine.

IODISED SALT

In many parts of the world, nowadays, small quantities of iodine are therefore being systematically added to articles of common consumption, in order to ensure that the thyroid shall be properly supplied ; and the results are admirable.

But the most widely used and probably most convenient method is to add a very little sodium iodide to our usual sodium chloride, thus providing the “ iodised salt ” which is becoming so familiar. In some parts of the world we consume this to our advantage, without knowing it. Montreux, for instance, is one of the most beautiful and famous holiday and health resorts on earth, and this town, like Vevey and Lausanne, is in a Swiss canton where *none but iodised salt is allowed to be sold*. This rule holds in several other Swiss cantons, and also in some of the States of the American Union.

I conclude this brief discussion of the subject by citing the example of the Swiss cantons which

either *allow none but iodised salt to be sold, or else require the iodised salt to be sold at no higher cost than the iodine-destitute.* This is the right policy, and I urge it upon the attention of all health authorities throughout the Empire.

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