The constitution and its reaction in health / by T.E. Hammond.

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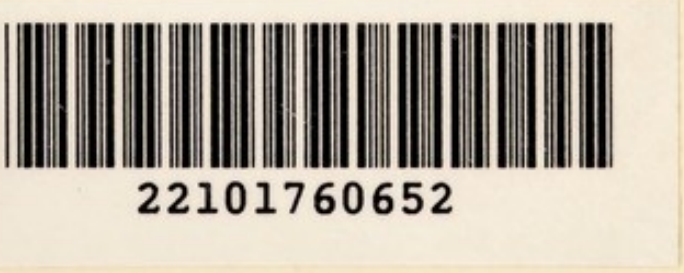

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BY

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TO

J. H.

PREFACE

THOUGH good health is the natural right of man, the ill health that prevails is appalling and shows no signs of decreasing. There must also be a large amount of impairment that hardly amounts to ill health, and that is scarcely heard of, for where there was one chemist's shop at the end of last century, there are three to-day. Research workers are inclined to say that the prevalent ill health is incidental to the advances of civilisation and is due to the strain of living, and that as civilisation and evolution are beyond control there is no remedy. But evolution is not a thing that has taken place ; it is still going on. And in past years man was able to adapt himself to the changing circumstances without becoming ill. As for the strain of living to-day, it should be remembered that the hours of labour are shorter, the food supply throughout the year is more regular, and housing conditions are better than they have ever been in our history. When those who put forward this line of argument are pressed, they fall back upon the telephone, the speed of travelling and the prevalent unemployment. But the telephone affects so few, and when it is disturbing it can be cut off. Compared with the slow cold trains of 30 years ago, the speed of travelling is an advantage for those who go upon a journey. Ill health is as common among the middle and upper classes as among the unemployed. For most people living is more comfortable than it has ever been.

Practitioners with whom I have discussed this subject point out that, if all the disease now described in the text-books could be removed by a wave of a wand, they would still be left with 80 per cent. of their patients. For their ill health is due not so much to any known disease as to the

failure of the constitution to adapt itself to the life led. These practitioners have brought home to me the importance of the constitutional factor in health as well as in disease. My view is that owing to the fashions and fads that have sprung up in recent years there has been too great a break with tradition and we have forgotten how to live. The result is too great a strain on the nervous system, and hence much of the ill health that prevails.

In this book the constitution is first dealt with and then certain factors that modify it and lead to much chronic ill health. The later chapters deal with convalescence, of which one is given to the treatment of Asthenia. The gulf between the case where the health is just impaired and the one where ill health is established is thus to some extent bridged. The Constitution in Disease I propose to deal with in another book. Chapter II has already appeared in the *Clinical Journal*. My thanks are due to the many practitioners with whom the points raised in the book have been so often discussed ; to Mr. H. E. Powell, the Librarian of the Royal Society of Medicine, who has brought to my knowledge much that is in the literature ; and to Mr. P. E. Garrett, who has taken so much trouble with the typing.

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CHAPTER I

RULES OF HEALTH

THERE has been a complete change in our outlook upon health during the last thirty years. Many contend that never in our history have the people been so healthy, and this they attribute to the attention now paid to rules governing health, which are chiefly concerned with exercise, fresh air, bathing, exposure to the sun, and diet. Physique has undoubtedly improved, and possibly good physique is confused with a good constitution. But the latter denotes something more. It means the power to do a day's work well, to undertake responsibilities, to stand up to vicissitudes, to face periods of strain in the life of the individual and of the nation with calmness and fortitude, to face and overcome adversity. If a man fails in any of these, his constitution has somehow let him down. For life is, after all, not merely animal indulgence and the gratification of the senses ; the individual should not be looked upon as just a mass of flesh.

A good constitution, again, means something more than the absence of disease and the persistence of a sense of well-being in the spring and summer. For it denotes power to pass through the winter months with energy undiminished and to go on through middle and old age with the faculties active and alert.

Much public money is now being spent upon the prevention of disease and the maintenance of health. Consider-

able propaganda is being carried on, and public servants to justify their schemes are attributing all the improvement to their methods. But how much of the improvement is due to the observance of certain rules that they lay down, it is difficult to say, for there is nowadays less poverty, less overcrowding, the hours of labour are shorter, and child-labour has been abolished. There are also increased facilities for treating the sick.

In the mining valley in which I lived, all the children went to the same school. If allowance is made for that small percentage (much less than 5) where the parents drank or where there was extreme poverty in the homes, there was little difference in the constitutions of the children by the time they reached the age of 12. Those of the middle classes then went to the secondary school. Those of the working classes went down the mine, from which time on many of them saw little daylight in winter, as even at the beginning of this century the shorter hours of working had not yet come in. The change was then obvious, for during those years around puberty, when so much care is needed, good food and good homes were no longer able to cope with the conditions that their work imposed. Could not equally good results have been gained if years ago food was sufficient and hours of labour shorter, even if they never gave one thought to health?

But is impaired health less common to-day than thirty years ago? For if diseases, such as chlorosis, are now rare, others are far more common. And though the hospital accommodation has increased enormously in the last twenty years, out of proportion to the increase in the population, there is still a long waiting list. It is said that diseases are now treated where years ago the patient was left to suffer. But whilst no provision was made for the treatment of some diseases, there was not so much neglect as some suppose. It is not that such diseases as gastric and duodenal ulcer were not diagnosed. They rarely occurred; and, though ill health and the chronic infection were then seen, they are, if anything, more common nowadays.

This may be due to the present methods of living, with their big demand upon the nervous system. For instead of nursing and building up the constitution, developing the physique by exercise and exposure to the air and sun may in some way undermine it. This has been carried out for less than twenty-one years—that is to say, for a period of one generation—and so many of those who are its devotees have yet to reach the age of 45. Up to this age men have so much vitality that any harmful influences are not immediately apparent, if they are lucky enough to have no serious illness. It is only as they enter the forties that the years begin to tell their tale, and any undermining of the constitution becomes obvious. It is then they become aware of whether their method of life has sapped at their vitality and realise how much they have left to face middle-age and the strain incidental to living. They can then for the first time realise the harmful effect of the methods practised when they were young.

It is noticeable that those who stay the course best are often men who seek comfort and who pay little attention to the rules of health. They are indifferent, if it is suggested that they are shortening their life, so long as they feel contented and at peace.

A year or so ago there was a long spell of bad weather when the north-east wind blew for more than a month. The majority of people gave up their daily walk and even golfers forsook the links. But there were still a few people who took daily exercise around the city square. Many of these were chronic invalids who were trying to regain health. Then some men were selected who were fit and well and were visited to see what they were doing. All had given up exercise and went out only when it was necessary for their work. Even indoors they were warmly clad and many admitted that they took a bath once a week. The rooms were fitted for comfort and there were big fires. There were thick curtains over the doors and windows, and soft carpets and rugs on the floor. These men did not

boast about their health or attribute it to anything they did. They regarded good health as their natural right. May not much of the health of the people really be attributed to this and not to any method that is followed?

If a class of people were taken whose circumstances have not varied so much with the passing of the years, it might be possible by comparing one generation with another to discover whether this marked improvement in health had really taken place. Unfortunately, the intrusion of the War interferes with this. For the revolution in thought and in the manner of living that followed divided our lives into two parts. And owing to the mobilisation of the population that took place during and immediately after this period, it is difficult to compare one generation with another. But I will make an attempt to do this with three generations belonging to the middle classes, who would not be so affected by the social changes. The first, composed of men of my father's time who endeavoured to carry on the tradition of the Victorians, I will call the 1850 type. The second, men of my own age, who were born about 1890 and who reached manhood in the years preceding the War: they will be called the pre-war type. The third, of the young men of to-day, who are now in their twenties: they will be called the post-war type.

The 1850 Type.—These men came from big families often containing ten to fifteen children. They had little luxury in their upbringing, though they had plenty of food and comfortable homes. In childhood few had ever taken a holiday. It was the time when men gave their minds to their work. Consequently, when they left school this was their first consideration. They never played games and gave little thought to the question of health. They were early risers and worked late into the night. When work was completed, they retired to bed. Exercise was taken only to a slight extent. It was, however, surprising how much walking they could do, if their work required it. In spite of this activity, life was lived more leisurely. More

attention was given to food and a long time was spent over meals.

If the weather was bad, they went out only to work, and then only when warmly clad. If the weather was fine, they might go for a short walk ; but when it was very warm, they took things quietly. They did not expose themselves unnecessarily to the sun. A holiday was taken once a year, and was looked upon as a relaxation from work rather than as a means for expending energy. It was taken quietly with the idea of overcoming the ravages of the work, of building up the health to go through the months that lay ahead, and of nursing up the constitution to face the rest of life.

The houses were well built to keep out the cold in the winter and the sun and the heat in the summer. The living-rooms were cosy and were kept warm with big fires. They had a distaste for too much sun and air. In their endeavour to avoid draughts the windows were rarely open, and then only when the weather was warm. They liked plenty of blinds and curtains and rugs about the rooms. Comfort was the order of the day, and this, not luxury, was studied. A bath was taken about once a week, sometimes less often. Even at the seaside bathing was not indulged in to any extent. This was left to the young.

Each wife had seven or eight children. They had the worry of bringing these up, for they could rarely afford more than one nurse ; and although servants were good and plentiful, active supervision was essential. There was a bustle from morning to night. There was little chronic ill health, and the chronic infections and gynæcological complaints, now so prevalent, were rarely seen.

It is the practice to run these people down, but I have the greatest admiration for them. They were governed by principle and willingly took upon themselves great responsibilities. If they demanded much of others, they never hesitated to set the example themselves. Their mode of life did not lead to ill health, but to comfort, contentment,

and a healthy old age. They were the jolliest people and never seemed to have time to be ill. During the War it was extraordinary how at an advanced age they responded to every call made upon them. Whilst they lived, Britain was the mightiest empire that the world has ever seen.

The Pre-war Generation.—These had a more luxuriant upbringing and an easier life. More attention was now paid to living, and a holiday once a year had come to be regarded as essential. On the other hand, they gave little thought to the rules of health. If ill, they were concerned because they could not take part in the activities of their fellows. There was little attempt to avoid work, which was regarded as the aim of life, and there was no lounging. There was, however, a definite tendency to take life more easily, to work shorter hours, and to rush work so as to get away to games, which now received far more attention. These, however, were never regarded as an end in themselves, but rather as a means of getting rid of animal spirits and of keeping fit.

There was little ill health amongst this class. But they realised that they were not the equal of their fathers. They were inclined to shirk responsibilities. Some in the early years had decided against marriage, and, even when this was contemplated, were determined to avoid the big family. When two great empires decided to fight in 1914, these men responded to the call. Whatever is thought of war and its causes, that effort will be regarded as supreme in the history of the world. After four years of severe physical and mental strain, their nervous systems were not the first to crack. But many who survived the War were broken by it.

So many things have been attributed to the War, that it must always be uncertain how much is really due to it and how much to a natural tendency on the part of men to gloss over their imperfections and to refuse to overcome an inherent laziness. Those who served in the War have become very quiet. They seem as if they are unwilling to attempt anything. This is not the case. It is rather that they have not the energy to make a sustained effort, for they have left

so much of their nerve energy on the battle-fields. For towards the end the strain of the constant fighting had become terrific, and it was realised at the time that victory would go to the men whose nervous systems would last the longest.

Some months ago, while dining with seven men who had served in the firing line, a comparison was made between our generation and that of our fathers. All were agreed that we had not so great an outlook as they, and that we were too ready to shirk responsibilities and to give up a task if it were unpleasant. It was felt that we were not likely to live as long (most of the parents had reached 70). It was impossible not to note the weariness that seemed to be about and which was not to be expected at their age. Now these men were not failures. They were all successful in their own professions. It was felt by all that they were suffering from their activities during the War.

The War affected men in many ways. Too much has been put down to the constant association with danger. For though few ever got used to those narrow escapes from shells or bullets, what now strikes one on looking back was the indifference of the men to death. They just laughed at danger. The prolonged and persistent shelling and bombing played a much greater part, for they undermined the nervous system. The effect that this must have had was brought home after a recent thunderstorm that lasted for an hour. For days afterwards the people were very jumpy and were going about with frightened faces. The effect of prolonged shelling and bombing would be far greater than this. Equally telling was the fact that it was a period of great physical and mental activity, during which men exerted themselves to the uttermost. This would have its greatest effect upon those in the twenties ; for at this age men are in need of and are better for some restraint. It is possible that in some way they played themselves out.

Is it that in life we are given just a certain amount of nerve energy, and once this has been used up it never can be regained ? In this way only is it possible to account for the weariness so prevalent to-day.

The Present Generation.—The whole outlook on life has become changed. The object of life now seems to be to

cultivate physique and health, so that life may be enjoyed and the instincts satisfied. Worship of the sun, of the open air, of bathing and of games has become the object of life. In an age of activity these people would be looked upon as idlers and loungers. It is true that similar rites were practised by the Greeks and Romans, but only in the intervals of strenuous effort, as a relaxation from work. They were never cultivated as the aim of living, as is the case to-day. Many who are advocating their value are young people under 30. They have not yet lived through those years when the strain of living is first felt, nor have they yet been up against life. They seem to forget that when a man has healthy parents and when the home and food are good, health should always follow. People of their class always enjoyed this without seeking or cultivating it.

These people are living entirely for the moment and are concentrating on the development of physique. Some are wondering whether in their effort to cultivate health by exposure to the sun and by exercise they may not be undermining their constitution. Few of the great athletes I have known have stayed the course of life, unless they have compensated for their early activities by later taking things extremely quietly. When they have some illness, they quickly go under. It is as if in the development of their physique they have used up something in their constitution. Is it certain that this post-war generation is going to stay the course? Is not the method of living with its strain upon the nervous system responsible for much of the ill health that prevails to-day?

Chronic infections seem more common. Functional disorders and nervous diseases are on the increase. Young people show an alarming tendency to crack up after an acute illness. Young women have one child and, though expert nursing is more available, remain invalids for years. Yet their mothers had many more children without suffering any ill health.

The Attainment of Health.—I have come to the view

that this so-called cultivation of health will eventually be found a big drain upon the nervous system. As they grow older, many of those who practise it will crack up when called upon to face any strain. The older views upon living were the result of careful observation handed down from generation to generation. Methods that have received the sanction of the ages should be changed only very gradually and after much thought. For whilst fresh air, sunlight, and exercise have undoubtedly some beneficial action, in excess they may be harmful to many.

The changed outlook on our views on health probably began towards the end of the last century, when it was found that tuberculous patients treated in the open air did better than those who remained indoors. It was, therefore, thought that as exposure to the fresh air and sun cured the disease, it might, if carried out in time, prevent the onset. It was then advised for all diseases. But curing a disease and building up a constitution are not the same thing. Though much of the treatment formerly advocated for tuberculosis has been modified in recent years, some consider that it is still too strenuous, for the end results are not too satisfactory.

The present method of living came in largely during the post-war period when people threw off all restraint and gave way to the impulse of the moment. Excessive dancing, late nights, etc., which were practised at that time, have gradually been abandoned. It was found that practised over a number of years they were too great a strain. May not this eventually be found to hold with certain procedures in regard to health that are now advocated for all ?

Many of the methods which are supposed to promote health have not been sufficiently tested. Those who are putting them forward cannot speak with that experience which can come only with the passing of the years. It is fairly certain that ultimately some will be found to be erroneous. They are often advocated by those who would have health whatever they did. Whilst they may do no harm to those who are healthy, since they can do so many

things with impunity, this does not apply to those who are not well.

In years gone by it has been my lot to have had a certain amount of ill health and often to have looked worse than I felt. Consequently, much advice has come my way. What is surprising is the number of healthy people who come forward with advice. They seem to think that their health is due to the special methods they have adopted, and that the cure of some illness was due entirely to this. They forget that good health is the natural right of man and that the majority of people, notwithstanding abuses, remain healthy. Even amongst the poor, who so rarely give health a thought and who live under appalling conditions, good health is the rule. In any illness the tendency is for the patient to recover regardless of the treatment. Nature always works in this way if she is given the slightest chance.

Some years ago it was necessary for me to undergo an operation. As my health was not sufficiently good, it was considered advisable to take a sea trip on a tramp steamer. The captain, a gentlemanly and courteous man, as most ships' officers are, proceeded to lay down the laws of living for my guidance. All that had to be done to attain perfect health was to adopt his procedure, which included one month a year in the sun at the Rio Plate. It never occurred to him that he had a wonderful constitution, and that he had no right to talk of the art of keeping fit, for health was natural to him. How could he by any stretch of the imagination have made himself ill? His method of earning his livelihood was one that would bring health to many a sick man. This is by no means an extreme instance of those who are so ready to talk on the subject of health.

It does seem that the majority of people are better when they can get fresh air, exercise, and sunlight, but little of the evidence in support of this is scientific. Most of it comes from long observation and tradition. It is not so easy as some assume to decide to what good health or even some improvement is due. So many factors come into play. For instance, the health of people is undoubtedly better in

spring and summer than in autumn and winter. This is attributed to the fresh air and sunlight ; but the difference is found even when these can have had no influence, for it is a seasonal variation. The improvement in the health of the men who went into training during the War has frequently been commented upon as indicating the need for more fresh air and exercise. In the early months of the War I was attached to the 13th Division, one of the first hundred thousand. It was remarkable how the physique of the men improved. But most of them had previously been working long hours in factories and mines, and often they had been unable to obtain proper food. For the first time in their lives many got good food, regular meals, and proper rest. The improvement was not noticeable in those who came from the middle classes, where these factors did not come into play. Yet notwithstanding that the troops then consisted of picked men, as recruiting in the early days was very strict, the winter months exacted a heavy toll. Many died, and many were invalided as a result of illnesses that occurred.

The War gave an opportunity to study different bodies of men. Those from the country were fitter than those from the town. But the finest were the men from the mountains and those who lived on or by the sea and those whose lives led them to mix with horses.

The physique of the French and Italian troops made little appeal to me, but the Alpine troops of both nations were extremely fine. The people of the hills are always sturdier and much better built than those of the plain, though the conditions under which they live are often not so good, and their food is rough and not so nourishing. This is also seen in nature.[1]

The men of the Navy are better than those of the Army, but sailors are always fine men. Yet the conditions under which they have to live, whether on land or sea, are often

[1] Mountain sheep are hardier and more active than the sheep of the plains ; though the trout of mountain streams are smaller than those of the plain, they fight more strongly.

bad. On a modern battleship the sleeping quarters are poor and the living-rooms are not well ventilated, and amongst sailors tuberculosis is still very prevalent.

Whether it is that it is only men of a certain temperament who are drawn to horses or whether it is that their work brings them more often into the open air, I do not know, but the men who mixed with horses were of a finer type and of better physique than infantry men. This was possibly due to many of them being country-bred. But it was noticeable even when they came from the towns.

It may be suggested that all of this indicates the advantage of living in the fresh air. The difference is not entirely due to this, for in addition to their health and fine physique these men had something about them that made a general appeal. It seems as if having to contend with nature and certain conditions in life develop the best qualities in men. But these men were not accustomed to take much exercise, to bathe, or to lie in the sun. These they were more often inclined to avoid. It is rather the men from the cities who adopt these practices in order to harden themselves and to develop the qualities of these men from the hills. But such qualities are due either to inheritance or to the reaction of their constitutions as they grew up by the sea or in the mountains. They are different from physique. If they can be acquired it is only by long association. The same is seen in regard to health. In past years strong, robust men rarely gave a thought to health. This was left to the invalid. We do not know what health is or how it is acquired or how it can be attained. Those who have it seem able to do whatever they wish without impairing it in any way. When it is poor, small causes that would not affect a healthy person may modify it considerably. It is now often so difficult to do anything that can lead to a permanent improvement. So far off is good health at times from those who are not fit.

When a prognosis has to be given in an acute illness, much depends upon the constitution of the patient. The

outlook is better if he has been moderate in diet, if he has been accustomed to take exercise, if he has spent some time in the fresh air, and if he has had a holiday some time in the year. It is less good if he is a big eater, if he has been accustomed to take much exercise, or if he has had to expose himself in all weathers. The outlook in a strong muscular man is often not so good as in the one of a sedentary life.

There is little doubt that the majority of people derive some benefit from fresh air, sunlight, and exercise, when taken in moderation. But there is considerable doubt as to how they act. They do not put something directly into the body. Probably the constitution has in some way to react. They will do good or harm according to what then takes place. This reaction, which is often referred to as the work of nature, varies with the individual. Even with the same one it varies from time to time with his state of health. As it is not possible by any scientific instrument to estimate health, one cannot foretell what will take place. Whilst certain principles can be laid down for general guidance, everything depends upon the constitution of the patient. Consequently it is absurd to talk of creating systems and of laying down laws of health. These have so many adherents because health is the natural right of man and is generally regained after an illness, whatever the treatment. The best practitioners know that they must look for the indications special to each case and try to fulfil them. This is possible only if something is known about the constitution.

In some of the following chapters I will attempt to appraise the value of fresh air, sunlight, exercise, and bathing. There will be no reference to the great contributions of scientists. Many books have already been published dealing with this aspect. Attention will be paid to clinical observations, to observations in nature, and to the views put forward by laymen, and an attempt will be made to reason from these.

CHAPTER II

THE CONSTITUTION

At the beginning of this century the aim of medicine was to bring relief and cure the sick. But since research was organised, more attention has been given to the study of disease. Much of the work of our hospitals is now devoted to this ; and the primary aim of medicine, the restoration of the sick to health, is sometimes lost sight of. For many medical men are now content if they can give a label to the patient. Possibly for this reason so little attention has been given to the study of the constitution in recent years. But before bacteria came to be recognised as an important factor in the causation of disease, and before the principles of physiology came to be applied in the elucidation of disordered function, much attention was paid to the constitution of the patient. Sir James Paget in his clinical lectures frequently referred to this and stressed the importance of the bearing of the nervous system on it. *The Pedigree of Disease*, by Sir Jonathan Hutchinson, will always remain the great classic on the constitution. But it must be remembered that his work was accomplished when bacteriology was in its infancy and bio-chemistry was almost unknown. Since those days we have learned much more about the causation of disease.

The constitutional factor in disease was frequently referred to at the beginning of this century. Sir Archibald Garrod in particular laid great stress upon it. But by the end of the War little reference was made to it, and we had come to look upon disease as something introduced into the body from without. All that had to be done to cure the patient was to destroy or to remove the intruder. Consequently the surgeon has come to look upon disease as if it

affected a single organ, and to assume that, if it were removed, the patient would be cured. The physician has come to look upon the patient as if he were an engine that had fallen out of gear, and that his duty was to discover where the derangement lay. Some seem to think that everything can be remedied by studying the mind; though it is doubtful if the calling of this a science and the extensive classification to which it has given rise are of much value. If we are to treat disease more efficiently and to restore health, it will be necessary to pay more attention to the power of the patient to react. It is consequently essential to investigate his constitution. The writings of Dr. A. F. Hurst and Dr. J. A. Ryle should be studied by those who are interested.

As Dr. Draper has pointed out, the constitution comprises those factors of the mind and of the body that a man derives from heredity and upbringing. It is the sum total of his being that may be modified or completely altered by the onset of some disease. It should not be looked upon only as the reaction to disease. It is equally the power to face life and to adapt oneself to its changing circumstances.

The constitution must not be confused with physique, which denotes the physical attributes. A man with a good constitution has usually a good physique, but not necessarily so. Too much attention is usually paid to height and to muscular development. For good physique it is not necessary for a man to be tall and muscular. The lean wiry type is often more adaptable to life than the well-built man, if staying power is to count. The finest specimen of manhood I have come across was Jim Driscoll, feather-weight champion of the world. He was just 5 feet 5 inches high, but every muscle was proportionately developed and, with his curly black hair and beautiful features, he was the nearest approach to Adonis I have seen. As the word is ordinarily used, the physique of another boxer, Jimmy Wilde, would be described as poor. Yet for endurance, vitality, and strength, he probably has never had an equal. The essential of a good physique is a well-co-ordinated

neuro-muscular system, as a result of which the ordinary movements can be easily performed and excessive strain can be undertaken with the minimum effort. There is, however, a great difference between a good physique and a good constitution. Those who have boxed know that for a man to go twenty rounds his condition must be perfect. Amongst the boxers in whose company I spent so many pleasant hours were six champions of the world. Of these, Tom Thomas, Freddy Welsh, Jim Driscoll, and Percy Jones died in the prime of life, two from tuberculosis, one from heart disease after rheumatic fever, and one from rheumatoid arthritis. Yet almost to within a few years of death their health seemed to be perfect. Only one took alcohol and that but occasionally. Though their physique was perfect, there was some flaw in the constitution.

Nor must constitution be confused with temperament, which refers to the mental make-up. Though a highly strung temperament may be an asset at one time and a phlegmatic at another, each of these has its disadvantages. The highly strung man feels too acutely and, when a prolonged effort is required, is liable to give in too quickly. He is too anxious when he is ill. The phlegmatic man may lie listless and make no attempt to respond, when this is most needed. The man who lasts the longest in life has the equable temperament.

The constitution must not be confused with health. It is surprising to note how those who seem so healthy crack up suddenly when called upon to face any strain, whereas those whose health is poor may have an unexpected reserve of strength that enables them to overcome insuperable difficulties and to remain active in middle and old age. In many a family it is noticeable how the healthy and active fail to stay the course, whilst the invalid gets stronger as the years go by and dies in old age without a single faculty impaired. Though at first the constitution of the former appeared the better, when the whole of the life-history is reviewed, the latter comes out on top.

Nor must the constitution be confused with resistance to disease, which signifies the power to prevent an illness and to overcome it when it occurs. A man with a good constitution must be able to face life and to do his work in any environment in which he is placed. Should any mental or physical strain arise, it is overcome without evident fatigue. Should an illness develop, it will usually be overcome and after a short convalescence will leave him unimpaired. He will remain mentally active in middle and old age and will pass through them with his faculties unimpaired. Such a man need not necessarily have good health nor need his physique be good, though his health must be sound. Almost invariably he has that equable temperament which allows him to enjoy life at all times and seems to indicate that the one essential of a good constitution is a well-balanced nervous system.

The majority of people have sound constitutions. They are able to adapt themselves to the conditions they are called upon to face. They can increase their mental or physical activities when the need arises and deviate them into any channel they wish. They are little affected by marked changes in their environments. They are well in all weathers and under all conditions. They can digest all foods. They are able to turn their efforts into any direction they may wish.

My work as a surgeon has brought under my care numbers of people suffering from injuries where there was no previous impairment of health and where the illness was not predisposed to by mental strain or anxiety. In this way an opportunity has been given to observe the reaction of otherwise healthy people, when called upon to face an adversity. At such a time it is not infrequent for some weakness to be disclosed. When the constitutional factor is considered, the only scheme that is not too complicated and seems of any practical value is that put forward by Hurst, who has found that, if a certain type is taken as normal, the majority of people are found to conform.

Many, however, will deviate from this towards a hypersthenic type on one side, and a hyposthenic on the other. It seems probable that these deviations depend on the activity of the nervous system.

This work upon the constitution is not likely to be furthered by drawing up a huge system of classification, a weakness of the present age. It would be easy to do so, but would lead nowhere and be of no practical use. It can be avoided by keeping to the terms of Hurst. I have contrasted the two types in the following table.

General Qualities of the Hyposthenic	*General Qualities of the Hypersthenic*
Pallid face.	Good colour.
Poor physique. If well built, fat and flabby.	Good physique. Well-developed muscles.
Slouching habits.	Inclined to be active.
Narrow chest with narrow epigastric angle.	Well-formed chest with wide epigastric angle.
Tendency to myopia.	Tendency to hypermetropia.
Shallow breathers.	Deep breathers.
Rapid pulse.	Slow pulse.
Perspires freely : perspiration watery.	Do not perspire too freely. Skin has an oily appearance.
Urine alkaline ; tendency to phosphaturia.	Urine acid with deposit of urates and uric acid.
If exercise taken, usually of quiet type ; long walks ; inclined to be naturalists.	Very active ; exercise is taken in all weathers. Often great athletes.
If good athletes, seem to be reserving their energy and to accomplish it with little expenditure of energy.	If athletes, conspicuous by their display of energy.
Prefer to be well clothed and avoid draughts.	Do not feel the cold. Indifferent to draughts.
Prefer warm weather.	Indifferent whether the weather is hot or cold, but prefer extreme cold to extreme heat.
Temperature sub-normal.	Temperature usually normal.
Introspective.	Extrospective.
Want of nerve energy.	Characterised by excess of nerve energy.
Quiet type of mind, not characterised by mental activity but often by mental ability. Often great thinkers.	Mentally very active.

General Qualities of the Hyposthenic	*General Qualities of the Hypersthenic*
Small eaters.	Big eaters.
Appetite poor.	Appetite good.
Food remains in stomach for at least four hours.	Stomach completely emptied within a few hours.
Low gastric acidity.	High gastric acidity.
Upset by many forms of food. Capricious in appetite. Avoid meat and protein. Tend to become vegetarians.	Great eaters of meat.
Drink much water.	Drink little water.
Spiced food in any quantity upset.	Take curries and highly spiced foods with impunity.
Aperients give relief but only temporarily. Seem to be later followed by some abdominal disturbance.	Often much improved by an occasional aperient.
Seem to be benefited by a very small amount of alcohol, but the slightest excess does them harm.	Take alcohol with impunity. Even excess does little harm.
Usually teetotallers. If not, prefer champagne and brandy.	Often accustomed to take alcohol, and prefer whisky and beer and wine. Rarely take champagne.
Indulge in coffee at 11 a.m. for the stimulation it brings.	Indulge in whisky at 11 a.m. It seems to rest the nervous system and by reducing its activity gives them a chance to think.
Take cold baths with a view to improving their health and to hardening themselves.	Rarely take cold baths. If they do it is for the glow it gives to the skin.
Benefited by a bracing place.	Benefited by a relaxing place.
Disordered function frequently arises after very little strain. Will often persist, but even so often leaves the health and the ability to do work unimpaired.	They seem able to do what they like in life without any ill effects supervening.
Prone to minor ailments.	Rarely have minor ailments. When afflicted the illness is severe. They are quickly worn out.
An inflammation tends to be subacute and to give rise to mucus or sero-pus.	An inflammation tends to be acute and to give rise to pus. Septicæmia by no means rare.
Bacillus coli infections more common.	Staphylococcal and streptococcal infections more common.
Acute infections such as pneumonia not common. As a rule are easily overcome.	Infections tend to run a very acute course. Often surprising what a little resistance is put up.
Chronic infections common. Tend to persist.	Chronic infections uncommon. Can easily be overcome.

General Qualities of the Hyposthenic	*General Qualities of the Hypersthenic*
Influenza not very severe at the onset, but tends to leave malaise or some chronic infection.	Severe from onset. Recovery with few after-effects.
Common cold frequent. Not severe, but tends to become chronic.	Common cold infrequent. Very acute and depressing when present. Easily overcome, leaving no after-effects.
If calculi form, of phosphatic type.	If calculi form, of uric acid or urate type.
If pain is present, not of great severity.	If pain is present, usually extremely severe.

The Physiological Aspect of the Constitution. — Some people can do their work best in the morning, others as the evening approaches. The power to do this depends on the constitution. The temperature of the body varies during the twenty-four hours. It is lowest about 3 a.m. and highest between 6 and 9 p.m. The metabolism of the body varies with the temperature, being lowest and highest at these times. This also applies to the vitality. This variation in vitality probably depends upon the relation of the earth to the sun. It is seen in nature, for at 3 in the morning all is quiet in the country. At this hour there seems to be a diminution in vitality of almost everything.

When I acted as medical officer to the 4th South Wales Borderers in Gallipoli, the difference between the men at the stand-to at dawn and at dusk was noticeable. At the dawn there was little life. At dusk they were cheerful and bright and full of fun. This I attributed at first to their having their tot of rum in the evening, and at my suggestion it was given in the morning. This made little difference. It was then realised that this was not a question of alcohol : it was dependent on vitality.

In an acute illness when the condition of the patient is serious, the hour of 3 to 4 a.m. is most critical. For this reason stimulants are given so that they will be able to act during this time. A good nurse will then have the room warm and the windows shut and the hot drink ready to be given if the patient wakes. She knows the need for employ-

ing all aids to maintain the vitality at this hour. It seems probable that the nerve energy varies with the metabolism and, like the temperature, is lowest in the morning and highest in the evening. The patient will survive if this energy can be maintained by the body fluids.

The hypersthenic has sufficient nerve energy at all times. Consequently, at 6 a.m. he is able to do any work he may desire. As the day goes on and his energy rises, this feeling of well-being tends to disappear, for his nervous system becomes too active. It is in the morning that his greatest work is accomplished. Towards evening he feels the need for alcohol and hot baths, not because they stimulate, but because of their sedative effect.

The hyposthenic, on the other hand, lacks nerve energy, and this is most noticeable when his metabolism is low. In the morning he feels off colour and is disinclined to work. For that reason he takes cold baths to brace himself. Consequently he does his best work in the evening and is often most active when about to retire for the night. He rises late and goes to bed late.

This relation of the nerve energy to the hour of the day may explain the variability in the action of tonics. It is well known that these may do good at one season and not at another, and at one hour of the day and not at another. Dr. Wm. Murray[1] has the following passage: "Then again comes the question of the time of day when our doses are to be administered—a perplexing question, often insoluble except we have our own experience of the patient's idiosyncrasies. I see some patients who can take a tonic well enough in the forenoon, but a dose after dinner or even after lunch is fatal to its success." We are still uncertain how tonics act. It is somewhat doubtful if we have one drug that adds directly to the nerve energy of a man, though cinchona and mercury taken for some time have a slight action. Strychnine and caffeine, however, increase excitability by some direct action upon the nervous system. This in all probability is due rather to impulses being con-

[1] *Rough Notes on Remedies*, by Wm. Murray.

ducted more readily than to any direct action upon the nerve cell. If this is the case, it will explain why they may do good at one time and not at another. For it may be an advantage to a man whose vitality is somewhat low to have his nerve energy more easily transmitted at 11 a.m., whereas at 6 p.m. he may have sufficient and would be inconvenienced by even a little more. It is probably for this reason that certain men feel better if they take coffee in the morning ; whereas at night it makes them feel ill.

The Bearing of the Nervous System upon the Constitution

The hypersthenic and the hyposthenic types depend upon the activity of the nervous system. Probably the former has too much nerve energy, the latter too little. It is not suggested that these tables give anything more than some slight indication as to the basis of the constitution. For the direction in which the nerve energy is expended will depend upon the temperament, the character, and the habits that have been formed as a result of training.

The hyposthenic constitution is often seen among scholars and those holding high positions in the civil service. They are quiet and retiring and are inclined to be studious and to read. Their vitality seems low. They are capable of doing a large amount of work, if allowed to take their own time. If the need for a sudden effort arises they may be unable to respond for any length of time. In this class are to be found the great thinkers. The hyposthenic constitution must not be confused with the asthenic state, when the patient is ill and there is undue fatigue and irritability after slight mental or physical exertion.

The hypersthenic constitution is often seen among busy city men with great physical and mental activity. They are able to dash off from meeting to meeting and to accomplish a great amount of work. The hypersthenic constitution must not be confused with hyperpiesia, which is the early stage of a disease.

The man with the hyposthenic or the hypersthenic constitution may have as great qualities as the one with the equable temperament. This is perhaps best illustrated by a reference to Lord Oxford, Lord Haldane, and Viscount Grey. They were men of lofty character with the same ideals in life. None will question their love of country and their sense of duty. Lord Haldane was essentially hypersthenic. His activity was tremendous and the amount of work he could accomplish was very great. His difficulty seemed to be to rest, for he talked incessantly. Viscount Grey was essentially hyposthenic. He was a great thinker who did fine work, but preferred the quiet ways of life. Lord Oxford had the equable temperament, and was equally great.

People only tend to deviate towards these types. It is rare ever to find one type well developed in any individual. Nor is the constitution stationary ; it varies as age progresses. For this reason certain disorders become less frequent or more frequent at certain stages of life. When the ordinary man is off colour or is ill, he will deviate towards the hypersthenic or the hyposthenic type, depending upon the primary nature of his constitution. The onset of some illness may completely alter the picture and modify the constitution ; once it has set in, this may persist for many years. This accounts for the presence of one type with the opposite bodily configuration.

The difficulties of trying to assess the constitutional factor in health and disease are very great. Hutchinson in *The Pedigree of Disease* points out that the signs supposed to denote the temperament (and he seems to use the word where we now use constitution) might disappear from trivial causes. He states :

" I have said so much in disparagement as well of the general as of the special signs which have been held to indicate temperament, that I fear it may be suspected that I almost doubt the reality of temperament in itself. If I have given that impression, let me hasten at once to remove it. There can be no question whatever as to the

reality of the difference between individuals, nor any doubt as to the importance of the recognition of these differences by the medical practitioner. By far the commonest error of the prescriber, and one which most interferes with his success, is the easy-going habit of regarding all persons alike, and recognising differences only in their diseases ; or, to put it in other language, ignoring the predisposing causes, and taking account only of immediate ones. The farmer who would succeed in his pursuits must not content himself with making sure that he has sown good seed, and according to the most approved methods. He must go further back to take knowledge of the nature of the soil with which he has to deal ; of the crops which it has previously borne and of the manures which have been used. It is much the same with us in the diagnosis and treatment of disease. In addition to the primary or exciting cause, which is of a paramount importance, we have various others which may perhaps be conveniently classed together under the term contributory, since they contribute to control and modify final results. Among these temperament —the original vital endowment of the individual—is unquestionably a real force, and one which we would most gladly recognise and estimate if we could. The scepticism which I have been expressing applies not to the reality of the thing, but to our ability to discriminate it."

Hutchinson was one of the greatest clinical thinkers of this or any other age. His observations have always stood the test of time. He lived in days when it was possible for a practitioner to keep in touch with his patients. His words should make us extremely cautious in forming even impressions in these days when it is so difficult to keep in touch with any body of men.

It is probable that the constitution changes with each generation. Most practitioners will agree that nowadays people are much more nervy than they were twenty-five years ago. The nervous diathesis or type of body undoubtedly prevails to-day. Anyone who takes the trouble to read through case histories will realise that the indications to bleed a patient a hundred years ago not infrequently arose ; and this applied to lowering the temperature fifty

years ago. Yet in my surgical wards in recent years the cases where there were indications for either, if such treatment were still the vogue, have been extremely few. Some take this to mean that disease has changed in its nature. Others that the constitution reacts in a different way from what it did then, which means that it has probably changed. It is known that diseases vary in their intensity from time to time. This was noted in regard to syphilis before the War. Those who had been in practice many years were quite definite that destructive lesions were not so common and less extensive. This occurred before there was any improvement in the treatment. In recent years scarlet fever has become quite a benign disease and measles a severe one. Some take this to mean that the organism has become more or less virulent. But it is known that during the same epidemic the reactions of a number of patients to the disease will be totally different. Now the individual reaction is dependent upon the type of the patient's constitution. In the same way diseases are found to vary from time to time. This may depend upon some change in the constitution which bears some relation to the way life is lived.

The term "nerve energy" as used here is difficult to define, though its clinical significance is known to every practitioner. It is something more than health and vitality. It is not that the hypersthenic will not rest and relax ; it is that he cannot, he has too much energy. It is not that the hyposthenic will not make an effort ; it is that he cannot. If he is able to make it, it cannot be sustained. He does not seem to have the necessary energy.

In past years the nervous system has been assessed by its function, which is the end result of the activity of its cells. On the one hand, this is shown by ability in the mental sphere, where thought is probably the highest function ; on the other hand, by the power to conduct impulses from the centre to the periphery or vice versa ; it is the aspect that physiology has studied in recent years and is probably its lowest function. But for the nervous system to function the cells must be active, and it is rather to the display of this activity that the term " nerve energy " is applied.

Possibly it is the central nervous system, and not its outlying parts, that plays the primary rôle in the constitution of man.[1] It is upon this that the end products of metabolism, the internal secretions, and all diseased processes eventually act. For too long the nervous system has been regarded as playing a passive rôle and serving merely to conduct impulses. But its cells play a vital part in our activities. To be able to respond they must be in a state of health ; and the nerve energy of a man will vary from time to time with their state. Unfortunately no method of assessing this nerve energy is yet available. When this can be done, the practitioner will have a method of estimating health. Unfortunately, he has now to rely upon his experience, his clinical acumen, and the sense of well-being of the patient.

When this question of health and the constitution is considered, it is well to keep in mind that we are talking about an abstract quality and not about something that is concrete and that can be measured. When it is said that a man looks healthy, it is only a comparison with other healthy men or with those who are sick. There is nothing definite upon which to work. It is this that makes the practice of medicine so difficult. The inadequacy of our methods was brought home to me soon after I qualified when watching Jimmy Wilde training for his fight with Tancy Lee. Though he was about to enter for a contest that demanded great mental and physical endurance, he was pale and had the appearance of a man dying from consumption. When his trainer was asked how he judged whether his men were fit to enter the ring, he replied that he was guided by the clearness of the eye. Since then I have always paid particular attention to this when estimating the fitness of a man. If he is well, the eye is clear ; if he is not well, the eye is dull and glazed. This clearness must be differentiated from the brightness that is seen so often in tuberculosis or in the early stages of pneumonia and other toxic states. It must not be

[1] Sir James Paget in his writings had always stressed the importance of the central nervous system. It was whilst reading his works that it began to come home to me that the function of all the systems of the body is ultimately to maintain the nervous system in a state of activity. I later found that Dr. Robert Hutchinson had put forward this view in 1928.

confused with a peculiar glistening of the eye that is seen in neurasthenia. But it gives information of departure from health long before any clue is given by the methods that science has evolved for detecting disease. It can be said that, when the nervous system is healthy, the eye is always clear.

When some scientific method is available for estimating the state of activity of the central nervous system, knowledge of health and of sickness will advance.

Even when the central nervous system is regarded as the basis of the constitution, this does not minimise the importance of other organs. For the constitution to be perfect, all must be healthy. If the function of one is impaired, it is bound to have some effect. For instance, it needs only a disordered function of the heart for a short period, such as is seen in angina pectoris, to end a life that before was apparently vigorous. When the blood is deficient in quality or quantity some effect on the health soon becomes apparent. But one of the greatest miracles in medicine is to see the stolid myxœdematous person becoming converted into a vivacious being when thyroid extract is administered. Now myxœdema is due to the absence of thyroid extract, and the improvement is due entirely to its administration. Whilst this takes place in all the systems of the body, it is most evident in the nervous system. What is really meant by the statement that the central nervous system is the basis of the constitution is that eventually the function of all the other systems will be found to be directed towards its activity. Nowadays when so much research work is being done, each worker endeavours to stress the importance of the work to which his efforts are being directed. Consequently each system in the body has its devotees. It is apt to be forgotten that the primary aim of medical science is the maintenance of health and the preservation of life. Some are beginning to wonder whether men have ever been farther than they are to-day from knowing what is the meaning of health and what is the significance of life.

CHAPTER III

STAGES OF LIFE

DURING the War the nations mobilised their man power. Work was abundant and no country had sufficient men. There came a day when a man, who could do any mental or physical work, was of some value to the State. Men of 45 went on active service and those over 70 came out of their retirement and took up work again, and seemed to be able to do it with little ill-effect. It is possibly on account of this that to-day there is a reluctance on the part of men to face the fact that as the years go by they grow older, and there comes a time when life is on the wane and a time when they will die. For few, except those who remain hale and hearty in spite of their years, like to be reminded of their age and fewer still that they look it. When so great an authority as Sir William Osler said that the real work of life is done before 40 and that after 60 it would be best for the world and best for themselves if men retired, much controversy arose. Yet the consulting staff of most hospitals and those who hold posts in the Civil Service have to retire at 60 or 65. For when this age is reached most men have seen their best days. But few will agree that the real work of life is done before the fortieth year, or that an age can be fixed at which a man's work can be regarded as over, if quality and not quantity is the thing that counts. For though a genius may be able to see the essentials at all the stages of life, the rest of us mortals gain wisdom only as the years go by. Though for most there is no comparison between the amount of work that can be done at 30 and 60, this applies inversely to its quality, if thought is the thing that counts.

The progress of life is, however, very gradual. W. H. Hudson, in *The Old Man's Delusion*, points out that from our

middle years our senses are subject to decay, but happily it is as if we didn't know and didn't believe. This also applies to age, for many are unaware that it is going on. Over a period of five years the change is so imperceptible that it is appreciated by very few. As age progresses any falling away in activity is often more than counterbalanced by an improvement in judgment that can come only with the passing of the years. Now middle-age and age should have no derogatory meaning. They are stages which all of us have to pass through. They are to be differentiated from senility and dotage, when the diminution in mental activity is obvious to others and the faculties are much on the wane. In my opinion a man starts to be middle-aged at 35 and aged at 50. But by aged is meant merely that the active days are over. He is now beginning to look back on life.

These ages have not been chosen at random. Twenty-one has been recognised for centuries as the age at which a youth becomes a man, for he is then said to have reached man's estate. Thirty-five has been chosen as the beginning of middle-age, because it represents the middle period of life, if three score year and ten be regarded as the allotted span. Of course it may be said that this should be 45, as a man is not grown up until 21 and it is the remaining fifty years that should count. But this would make middle-age too late, for a man of 40 cannot in any way be regarded as a young man. At all times men of 20 have looked upon those of 40 as elderly. When they reach 40 they must be prepared to face this. Fifty has been chosen as the beginning of age for the following reason. It is probably the period when the changes that are associated with the menopause come to an end. Puberty starts about 15. It is not just a phenomenon of sex. It is something far greater, for it represents a great change in the mental and physical powers. Changes in the physique are obvious and there is a different outlook on life. These are so considerable that they must take many years ; and it is probable that they are not completed until 21 ; that is, they take a period of six years. The menopause begins in women at 45. It has for too long been regarded as just a sexual phenomenon, because menstruation ceases.

It is something much more than this, for changes in practically all the functions of the body occur. The physique becomes altered, so does the outlook on life. If six years are given for these to become stationary, as is the case at puberty, it would mean that age begins at 51. It is frequently stated that similar changes are not seen in men. This is because too much attention is given to the persistence of sexual power and desire. But how much of this change is really physiological and how much is the result of the imagination it is difficult to say. If a body of men are studied at this age, the change in their physique and mental outlook makes it very obvious that something has really occurred.

I hold that a man is in his prime from 21 to 25, though this may not be apparent in those pursuits where a diminution in activity is more than compensated for by a gain in experience. But mentally, experience counts for so much that it will always be uncertain when a man is at his best. Men often change their views on this subject to suit their present age. If, however, a pronouncement has once been made, it should not be changed without due cause. So far as the stage of greatest physical activity is concerned, mine was made under the following circumstances.

After heavy fighting at Helles, Anzac, and Suvla Bay, that great battalion, the 4th South Wales Borderers were picked troops for the evacuation of Suvla. When this was successfully accomplished the battalion was taken to Lemnos. After such a spell of service all thought we were going down to Egypt for a rest ; some even talked of home. On Christmas Day, 1915, an order came through that the battalion had to parade the following morning fully armed and lightly equipped. This had only one meaning, that we had been chosen for the evacuation of Cape Helles. This was equivalent to sentence of death, for we all knew what Helles meant. No one thought it possible that we should get away a second time. That night as we sat at dinner, we talked of many things. When men are called upon to face danger they are extremely honest with their thoughts. Nor was there any necessity for pretence, for we had been together in many tight places and had got to know the qualities the

others possessed. The shock had been rather great, for no one had anticipated this journey. The end of the battalion was in sight. Someone suggested that we were all going to pass over in our prime. The question was put to me as the medical officer, as to when a man was in his prime; my answer was 21 to 25, to which no one took exception. Most of us were of that age.

That night I discussed the point with one who was much older than the rest (somewhere over 50), who had served in previous wars and who had travelled in many lands. He was inclined to agree with me, but pointed out that it was necessary to differentiate between activity with its power to do, and endurance with its power to accomplish. He had in this War often longed for the activity of the younger men: but they were inclined to squander their power even during a fight; whereas he with his experience was always reserving it, with the result that he was able to endure just as much as they. He pointed out that experience would always count in both mental and physical work, as it enabled a man to reserve his powers and this compensated him for the waning of activity. He suggested that whereas 21 to 25 was the period of greatest activity, men were fittest, if endurance were to count, from 25 to 35.

(*a*) **Physical Power.**—It is by no means easy to ascertain when this is greatest. For there is probably no form of exercise that depends on activity alone and where improvement does not come with experience. In games of skill, such as boxing and Rugby football, this will count to a great extent. As these games, however, test the wind and can be carried out only by one who is physically fit, any decline of power will soon become evident. Too much consideration should not be given to the great athletes, for they have a special aptitude for the playing of games and consequently last much longer than the average man. Take, for instance, an international footballer. He is better than the ordinary first-class player and can go on playing in first-class football long after there is a decline of power. It is when playing in

his own class, namely among internationals, that this is first evident. Few men attain international status before they are 21, and only a select few go on after 25. It is rare to see a cap being awarded after this age. In first-class football the average man rarely gets into the team before he is 20 ; nor does he retain his place much after 25.

In boxing a knowledge of the art and the ability to reserve the strength count much. These can be acquired only by experience, though any falling off in activity is to some extent compensated for by the experience gained. Speed is so essential that any failing in physical power is soon obvious. This particularly applies to the man who has difficulty in retaining his place in a certain class. Most boxers are in their prime from 21 to 25, though amongst the lighter weights, where speed counts, they may come to the front at an earlier age, and among the heavy weights, where stamina counts, they go on for a longer time.

The way young children exert themselves at times is strange. Their energy seems to be boundless, but they let themselves go to the limit of their capacity and have nothing in reserve. This is apparent when it comes to a purposive action. Whereas youths of 16 seem to be very active, they are not so speedy or so strong as they are at 21, nor can they last so long.

Loss of sleep knocks youngsters up straightaway and it plays havoc with those under 20. Whereas those in their twenties can lose one night's sleep with little ill-effect, its loss on several nights is soon felt and becomes very evident. On the other hand, those between 25 and 35 are not so quickly or so much affected. Their stamina seems greater.

These facts seem to indicate that activity, particularly if speed is essential, is greatest between 21 and 25. Whereas endurance is greatest between 25 and 35. I have taken every opportunity to discuss this with battalion medical officers. Though many different opinions are bound to be

given, most agree that, if they were picking men for a sudden burst of activity such as a forced march lasting for a week or ten days, they would choose men of 21 to 25 ; whereas if it were for continuous fighting lasting for months, they would prefer men of 25 to 35.

This was borne out during the War. At the beginning, when the need for troops was urgent, and the training was extremely strenuous, it was found that the men of 21 to 25 stood the test the best, for older men cracked up, and in the early days recruiting was limited to this age. Yet when it came to the continued fighting in the trenches, and particularly of the type that was experienced in Gallipoli, where the privations were severe, it seemed that those who stood it best were between 25 and 35. There are, of course, many exceptions. In my battalion there were youths of 17 and men over 50 who stood the test extremely well. What is meant is that if a body of men between 25 and 35 were chosen the majority would last the course if subjected to great activity or marked privations, whereas only a few of the lads of 17 and the men of 50 would. Men like Meredith, the Soccer player, Bancroft, the Rugby player, and Driscoll, the boxer, went on for years, but they were exceptional athletes in a class of their own.

(*b*) **Mental Power.**—When mental power is discussed, it is necessary to differentiate between activity, by which is meant the power to apply oneself at will, and achievement, by which is meant the power to accomplish what is wished. The latter corresponds to endurance, and will improve as knowledge increases. This is of such great importance that it will far more than compensate for any falling off in activity. This difference between activity and achievement may be illustrated by the following :

A medical man who was an extremely hard worker told me that in the twenties he could work at his books into the early hours of the morning, and simply cursed the necessity for sleep because it interrupted his work. He had no difficulty in working, and could concentrate as much as he

wished. His aim then was to accumulate knowledge. Books were learnt almost by heart and much useless knowledge was acquired. The time that was wasted was consequently considerable. For instance, he read Osler's *Medicine*, and for some reason, not now apparent, learnt the respective numbers of blacks and whites even to the decimal point. In the forties he is not able to read so long nor to concentrate to the same extent ; and if eight hours' sleep is not forthcoming, he is not able to work so well the next day. But as a result of the knowledge and the experience gained, his work is done to better purpose. Pages are now skimmed through just to pick out the essentials that are stored in the memory. And so, though his activity is less, his achievement is greater. And there is no falling off in his mental power, for he is able to work to greater effect.

Probably the period of mental activity is greatest from 21 to 25. At the end of that time it starts to wane. But this is far more than compensated for by the knowledge that is being gained and the mental power goes on increasing considerably. It will begin to decrease when the lessening in activity is not compensated for by an increase in the power to achieve. This will vary with the individual, and takes place when the thickening of the cerebral arteries makes itself felt. This is usually about 55. But the change is not rapid. If the decrease takes place at the same rate as the increase, the mental power of a man of 65 is comparable to that at 45. Young men who push forward the claim for activity are inclined to overlook this. However eager they are to display their knowledge, they cannot have that experience so essential for great achievement and which comes only with the passing of the years.

(*c*) **The Indian Summer.**—As autumn arrives and the days go by, many begin to anticipate with a little apprehension the winter that lies ahead. But sometimes there comes fine weather that may last only for a day or two or even for a longer time. The wind comes from the south and the sky becomes blue. Swallows are seen again, and some birds may begin to sing and even to build their nests. This

period, which helps to shorten the winter, is known as the Indian summer. It is often the most delightful part of the year ; for it is so unexpected and it enables one to recall the beauty of the summer days.

Often as people get older and the faculties become less alert, they tend to retire within themselves and commune with the thoughts which they once held. But just when senility seems imminent, there may occur a period that may last many years, when the mists are raised and a man is able to make contact with the spirit of his youth. This is the Indian summer of life. It must not be confused with the second childhood that sometimes comes towards the end, when there is a feebleness of the intellect. Nor with the attempts of elderly people to behave with jocularity and sportiveness, as if they still retained their youth. In the true Indian summer it is not a question of regaining but of appreciating again the spirit of youth.

It is perhaps best described in the words of John Richard Green : " What seems to grow fairer to me as life goes by is the love and grace and tenderness of it ; not its wit and cleverness and grandeur of knowledge, but just the laughter of little children and the friendship of friends, and the cosy talk by the fireside, and the sight of flowers and the sound of music." John Galsworthy, in *The Indian Summer of a Forsyte*, refers in many beautiful passages to this. But at times one is left a little uncertain as to whether old Jolyon Forsyte, knowing that his end is near, endeavours to compress into a few months something that should have taken many years, or whether Galsworthy makes the mistake of confusing here, as he does at times, a love of beauty with passion. For, in spite of the beauty of the setting, one is left wondering whether this romance might not inadvertently develop into passion, so perilous does the position seem. For the true Indian summer must be free from all desire. Even the hint of this at such an age would spoil its beauty. There should now be just a love of beauty for beauty's sake.

A patient, aged 82, who had suffered much sorrow and

loss in life, told me that the finest period he had passed through was one that was then coming to an end. During this time he could recall and enjoy again the pleasures that had come his way in his youth, and this was all the greater because he could contemplate them with calmness and peace. His knowledge that he was soon to finish with the affairs of this life seemed to enable him to appreciate all the more the beauties that had, to some extent, been spoiled in earlier life by desire. He had the pleasure of feeling that young people were now drawn to him, and felt it was worth while going through all his suffering just to pass through this Indian summer once.

As people grow older it is noticeable how they prefer to forget the present and to live over again the days of their childhood. It is as if after reaching the age of 55 they are going back step by step through the stages of life. Does the Indian summer correspond to those last calm years of life between 10 and 12, before that turbulent period of puberty began? It is often strange to note how those who are young are attracted to those who are old. This is not mere sentiment or a respect for age, for it is seen with children who are too young to appreciate either of these. There seems to be a kinship between the two. May not this Indian summer be regarded as the real second childhood of man? The phrase, "Those whom the gods love die young" is taken by some to mean that those whom the gods love are young when they die. May it not be that they die just as this Indian summer, the most beautiful period of life, begins to wane?

In the prescribing of drugs for children, the practitioner is guided by the age. And $\frac{\text{age}}{\text{age} + 12}$ represents the fraction of the dose that should be given. Age is also important in prognosis. But little more attention than this has been paid to it. When the constitution comes to be studied in its relation to health and disease, much attention must be given to the age. For whether a reaction will occur will

depend to some extent upon the stage in life reached. On one side of 35 this is fairly certain ; the tendency then is for the response to be too great. On the other side, less and less is to be expected as the years go by. It is for this reason that a form of therapy that did good in earlier years may fail or may even be harmful in later life.

At times, men in the twenties are heard to say that theirs is the best age in life, and men in the fifties that this is the best they have passed through. But the former are speaking without experience, and the latter have forgotten their former activity and the joy of living to which it gave rise. For at one end of life there is activity without experience, as a result of which there is much wastage of effort. And at the other, there is that experience which can come only with the passing of the years, but activity is now on the wane. It is absurd for a healthy man of 50 to pretend he is as active as he was at 30. He may feel as fit and may be able to carry out his duties in the same way. But this is quite different from retaining his activity. For a sound constitution gives sufficient energy to meet the zest for living at all stages ; and to one who has health each will have its beauty and its joy. After all, does age really matter, if the faculties are retained and the spirit of a man goes on ? Sooner or later it will again come home that it is experience and not activity that is the thing that really counts, and it can only be gained as life is lived.

But when life in its various stages is considered, it is obvious that it is unwise to attempt to live in the same way at 40 as at 20. With the passing of each decade, there is certain to be some change in the constitution ; for life to be thoroughly enjoyed, there should be some change, even if it is only slight, in the manner of living.

CHAPTER IV

THE REACTION OF THE CONSTITUTION IN THERAPY

When the action of drugs was discussed in books upon therapy at the end of the nineteenth century, the importance of giving consideration to the constitution and the state of the health was always stressed. For it was not then supposed that they acted so much by a direct attack upon the disease as by some reaction to which they gave rise.

In the subsequent chapters the reaction of the patient is referred to, by which is meant the processes that are set up by the tissues and cells of the body. When no form of therapy has been undertaken the reaction is sometimes spoken of as the work of Nature. It is perhaps best exemplified by a reference to certain principles in surgery and the treatment of bacterial infections. Notwithstanding the great advances that have been made in operative technique, the surgeon has always to rely on the power of the tissue to react. For the healing of a wound takes place by the formation of granulations and fibrous tissue, and the union of a fracture by the formation of callus. These are produced by the tissues : they are not something introduced by the surgeon. When a wound is sutured the surgeon brings the adjacent surfaces into apposition and maintains them there. And, when a bone is fractured, he reduces the fracture and maintains the ends in apposition. If granulation tissue and callus are not formed by the tissues union does not take place.

When bacteria have invaded the tissues and an inflammation has started, it is doubtful whether a direct attack on them is possible, apart from the removal of the organ. To overcome the infection the surgeon has again to rely largely on the power of the tissues to react.

Comparison of the work in surgical wards to-day with that done in the middle of the last century will always show the great debt of mankind to Lord Lister. For not only did he prove that bacteria were the cause of infected wounds and inflammation, but also showed how to prevent them by destroying the bacteria. The application of these principles by succeeding generations has made modern surgery safe. But our homage to Lister should not blind us to the fact that he taught us little, if anything, about the treatment of inflammation and infectious diseases. For the methods he advocated are of little use when either of them has started. The power of the tissues to react now counts. It is because this is not realised that we have gone so much astray in therapy. For were antiseptics to be present in the body in sufficient strength to destroy the bacteria, they would be more likely to destroy the delicate cells of the tissues. Even before the War it was easy to render aseptic a healthy skin or mucous membrane. Several reliable procedures were available. The only controversy seemed to be as to which gave the better results, the aseptic or the antiseptic method. But neither had much effect on a surface inflammation. Surgeons realised that there was something here with which they were unable to cope. Some other explanation was looked for, and some turned to the works of Sir James Paget and Sir Jonathan Hutchinson. Paget in his Lectures stressed the importance of attending to the constitution and of the power of the patient to react, and Hutchinson pointed out how essential it was to study the constitution in therapy.

But the medical profession as a whole were concentrating upon the bacterial conception of disease. As the technique improved it was found that bacteria were present in many situations in disease when they could not be detected there in health. Consequently they were regarded as the cause of ill health. It was felt that if only they could be destroyed, health would follow. And when, in 1910, Ehrlich introduced salvarsan for the treatment of syphilis, the discovery of some antiseptic that would give rise to *therapia sterilisans*

magna seemed within our reach. No one doubted that salvarsan acted as a germicide ; as Schaudinn in 1905 had proved that syphilis was due to the treponema pallidum.

But during the War our belief in the power of antiseptics was rudely shaken. In the early stages they were applied fairly strong, but this merely led to sloughing of the tissues and did not prevent infection from arising. It was only rarely that wounds healed by first intention. By the end of the War there was a great improvement. But at this time the process generally adopted was as follows : As soon as possible after the wound was inflicted, the surrounding skin was washed with soap and water, as much of the damaged tissues as possible was excised and 1 in 1,000 flavine in normal saline was applied as an antiseptic. Reliance had, however, come to be placed more upon the excision of damaged tissue than upon the application of the antiseptic. For where there was much damage to the tissues an inflammation was liable to arise no matter how soon the antiseptic was applied. It was difficult to get it to penetrate sufficiently far. Even excision failed if there was much delay.

On the other hand, when an inflammation had arisen it seemed doubtful whether antiseptics had any action at all, for few, if any, penetrated and, when dealing with a surface inflammation, the surgeon is in a favourable position. He is able to apply antiseptics in any strength that is desirable and for as long a time as may be wished. In addition he is able to watch the progress. Yet their action was so insignificant when compared with their great power to render a healthy skin or mucous membrane aseptic, where a direct attack on bacteria is possible.

But once an inflammation has arisen it is not the bacteria on the surface or the pus that are the cause of the trouble, but the bacteria that are developing more deeply in the tissues. Even if it were possible to penetrate to these, the cells of the tissues which are more delicate than those on the surface would be damaged. At such a time a surgeon has to rely on the powers of the tissues to react. It is very little he

can really do to assist. When the writings of Lister are carefully read, it will be found that he never claimed to have revealed to us what this reaction was or how to assist it, though he does advise us to leave Nature alone. If a surgeon thinks it advisable to interfere he should make certain that any good that may result is not more than offset by the harm done to the tissues.

As antiseptics had so little action when applied to a surface inflammation it was not long before surgeons began to wonder how they could have any when given intravenously. That salvarsan had a definite action in the treatment of syphilis was established and this was particularly marked when extensive lesions were present. But if arsenic was present in the blood in sufficient quantities to destroy bacteria, as bacteriologists and biochemists maintained, how was it that the far more delicate cells of many organs were not also destroyed? And as antiseptics applied to wounds had such difficulty in penetrating into damaged tissue that it was considered better to excise it, how could they penetrate into syphilitic lesions in which the vascular supply was impaired by fibrosis and endarteritis? Mercury also has a definite action in syphilis, but the amount in which it is given in my practice (gr. $\frac{1}{2}$ hydrarg. cum crete t.d.s.), where its action is quite definite, means that it is never in the blood in a strength sufficient to have any antiseptic action. Bismuth also can clear up syphilitic lesions, yet the drug has no action upon the spirochæte when brought in contact with it outside the body. If this is so, how could it act when given internally? Is it not more likely that the curative effect is due to some reaction that takes place with the cells and to some change that is produced in the constitution? The result is sometimes described as the reaction of the patient or the work of Nature.

Hutchinson held that, if mercury acted as an antiseptic, it also reacted with the tissues of the body to produce its effects. In his book on *Syphilis*,[1] he says :

[1] *Syphilis*, by Sir Jonathan Hutchinson (Cassell & Company Ltd.).

"Small doses of mercury assist the formation of fat and muscle. Everything depends on dose and upon the patient's idiosyncrasy. Whatever the idiosyncrasy, however, if the dose be reduced sufficiently, the drug may be made to agree. Reduce the dose of mercury sufficiently, the drug will be borne, and when it is borne, it will cure. It is not the quantity of the drug which is needed but the effect on the organism; and, if the specific effect is gained by a minute quantity, it is only not needful but bad practice to attempt to increase it. The chief difficulties in treatment occur with those who are insusceptible, not in those who respond easily."

In his book, *The Pedigree of Disease*,[1] he writes of the action of iodides:

"Probably there is no drug respecting which the assertion can be more easily demonstrated, that it is not the dose but its effect which should be regarded. It by no means follows that because a patient has an idiosyncrasy against some drug or an article of diet that we ought wholly to abstain from its use. Rather this susceptibility, in the majority of cases, proves that in him minute doses will effect the cure just as efficiently as larger ones in others. I have repeatedly cured tertiary ulceration of the throat and skin in patients in whom I was assured iodide was a poison in all doses by giving it in quantities of half or even a third of a grain."

Now this teaching of Hutchinson means that it is the reaction of the tissues to the drug that cures the lesion, rather than any direct action it may have upon the bacteria. For by susceptibility is meant that the patient reacts to an extremely small dose. In other words, the beneficial effect of a drug is due to its effect upon the constitution.

If drugs act in this way it is important to remember that the tissues of the body have to respond, and much harm may result if too big doses are given. For over-stimulation of cells, the function of which is impaired, is probably as harmful as over-stimulation of a diseased organ. Now this is particularly apt to occur when a man is ill. For illness is a

[1] *The Pedigree of Disease*, by Sir Jonathan Hutchinson (J. & A. Churchill).

condition of all the tissues and cells. At such a time it is unwise to call upon them for a response that they might be able to make when healthy. This was realised by physicians in days gone by who varied the amount of the drug according to the state of the health. They were careful observers and had noted that when a patient was ill he did better with small rather than big doses. This may best be illustrated by a quotation from Dr. Wm. Murray :

" If in doubt as to the amount of calomel or grey powder we shall give to a child, lay bare the nates, and if you find them thin, flat and flaccid, give but a small dose. If, on the other hand, the little gluteal regions come together like the chubby cheeks of a cherub, you need have no fear of a free dose."

In other words, if the health is good, big doses can be tolerated ; if it is poor, they must be small. Murray also has the following passage :

" The mistakes which occur in the treatment of diseases may be divided into those arising from a false diagnosis and those in which the wrong remedy is used where the diagnosis is correct. With regard to the misapplication of treatment when the diagnosis is correct, I may say this is often owing to the want of a true appreciation of the temperament and constitution of the patient, whereby we are led to give what is good enough for the disease but bad for the patient. Let us ever remember, therefore, that we are treating patients as well as diseases, and what may, rigidly speaking, be the right thing for the disease is often the wrong thing for the patient."

If this attention to the constitution is so essential for the cure of disease, it is equally so for the promotion of health. Often when health-giving measures are prescribed, such as sunlight and fresh air, some are inclined to think that health is put into the body as if it were taking up food ; and because a certain amount does good, twice the amount will do twice as much good. This has so often led us astray in therapy.

Of this the treatment of consumption is a good example. At one time it was thought to be due to a draught, so the patient was kept indoors carefully wrapped up and little fresh air was allowed to enter. When it was found that some did better when this was not carried out, the fresh-air treatment was begun. It was assumed that the more fresh air the patient had, the better he would do. Consequently he was kept out both day and night in all weathers. Some practitioners came to think that the object of treatment was to get as much pure air into the lung as possible, for in this way the tubercle bacilli would be destroyed. As the air at a high altitude is purer than that at a lower, many sanatoria came to be built in high places. Anyone who considers the tenacity of the tubercle bacillus and the nature of the tuberculous lesion must realise that fresh air does not act in this way. It does good because it causes some reaction in the body that raises its resistance to disease. If this does not take place or if over-exposure lowers the health, fresh air may do harm. It is foolish to increase it, and considerable harm is still done to patients in sanatoria by keeping those who have not the constitution to respond out in the open air. There is a type of patient who will do much better if treated indoors, with just a window open, or even with all the windows closed at certain times of the year and particularly when it is cold and the north-easter blows.

If we are uncertain how drugs act notwithstanding so much research, we are equally uncertain as to what takes place when a person is exposed to sunlight, fresh air, bathing, and exercise. Their action is due not so much to what they put into the system as to some reaction that takes place with the constitution. Sunlight is an example. The feeling of well-being that occurs immediately the sun appears may be due to some action upon the lipoids of the nerve cells as a result of which the nervous system can conduct impulses better. This is possibly analogous to that which is seen, though in the opposite direction, with anæsthetics ; for it comes on so quickly. The improvement which takes place later is the important one so far as health is concerned ; it is associated with an increase in the metabolic rate and must

be due to some reaction on the part of the body. If it cannot take place, the cells are being over-stimulated, and this does harm. For this reason even a little sun may be harmful to those who are old, ill, weak, or wasted. It is not that they would not be better for the energy that the sun provides for others. They need it to a greater extent. The trouble is that the cells of their bodies cannot react to produce it.

Normally a man is able to adapt himself to all conditions of life with little ill-effect. If he is afflicted with any disease, he is able to overcome it with little difficulty. For this reason we say that, if nature is left alone, she will do her work very well. His health is such that it is not affected by conditions that may ordinarily arise. He can expose himself to the sun and fresh air and indulge in exercise and bathing without the slightest ill-effect. But when his health is impaired, it is another matter. These may do good or harm according to his state at the time and the nature of the constitution.

The constitution received attention in past years. One hundred years or so ago ill health was regarded as a modification of the temperament, and this word was used where we now speak of the constitution. The sanguine, the phlegmatic, the melancholic, and the lymphatic were described. It was thought that ill health was due to too much or too little of the humours, and an attempt was made to increase or decrease these. Later it was thought that some people were predisposed to disease, and the bilious, the scrofulous, the nervous, and the arthritic habits of the body or diatheses were spoken of. Though attention was given to the disease, much was given to the constitution. For instance, the bilious diathesis included those cases that are now regarded as functional disorders and chronic infections such as chronic appendicitis, chronic cholecystitis, and chronic metritis. In those days these local lesions were regarded as secondary to the diathetic factor. Mercury was regarded as almost a specific in the bilious diathesis. But the dose depended not

so much with the nature of the disease as on the constitution of the patient and the state of his health. Everything depended whether a reaction could be produced. The aim was to produce just sufficient of this. Too big doses were avoided since over-stimulation could do harm. In Chapter II it has been pointed out that the central nervous system is now regarded as the basis of the constitution. When the constitution is sound and the nerve cells are healthy, it is easy enough to maintain good health. The difficulty comes when their function is impaired. In subsequent chapters an attempt will be made to show that the state of these cells to some extent depends upon factors to which attention has come to be given in recent years. But the tendency is to assume that they can do too much and, because they can do good with some, that they will do good with all. Because they are being applied in too big an amount or to a patient with the wrong type of constitution or at a time when the constitution has been undermined by some illness and can no longer respond, there is a danger that they will fall into disrepute. The hypersthenic has generally too much energy. He is inclined to react too quickly and too much. When his health is impaired, he is often in need of something that acts as a sedative. The hyposthenic has too little. He is inclined to react too sluggishly. When his health is impaired, he is often in need of something that will build it up. It is important to keep this in mind now that nervous disorders of the constitution are becoming so prevalent.

Sun, fresh air, and exercise add to the energy, if they are not carried to excess. But they can do good only if the cells of the body are in such a state that they can respond. When this is possible they must be given in the right amount at the right time to the right type of person, and in the pursuit of health, as with so many other things in life, moderation is the key to success. It is well perhaps to stress here again that health is not a concrete thing that can be introduced into the body. It only comes if the cells can respond to the

demands that are made upon them. The basis of therapy in health and disease is the fact that the cells of the body have to react, and to do so they must be in a sufficiently healthy state. *Therefore the weaker a man is, the smaller the dose that should be given.* In addition, the reaction is not the same at all stages of life. For all the organs show some changes with the advance of the years, and consequently the power to respond varies with the age.

CHAPTER V

THE BEARING OF THE SEASON AND WEATHER UPON THE CONSTITUTION

PEOPLE feel better in spring and summer than in winter and autumn.[1] This is attributed to the abundance of fresh air that comes from the windows being left open and from their being able to take walks. But this increased vitality is also seen in animals that are kept out in the open during winter and summer, and so it is now attributed to the greater warmth. But it cannot be due entirely to this, for it is seen in people who have to remain indoors, where the temperature of the room may be as high in winter as in summer. The feeling of well-being that comes in the spring and summer is similar to the increased activity that is then seen in nature generally, particularly in the flowers, birds, and animals. For just as the vitality of man varies during the day and night and seems to depend upon the relation of the earth to the sun, being greatest in the evening and lowest in the morning, so does the vitality vary during the year and seems to depend upon the relation of the sun to the meridian, being greatest at the summer solstice in June and lowest at the winter solstice in December. This probably accounts for the feeling of well-being in the summer and its absence in the winter.

[1] The influence of the weather upon health can never be decided by statistics, as so many factors come into play. Take, for example, a cold, frosty winter. Many medical officers of health say that this is good for health, because epidemics of fever are few. But practitioners, and certainly those who work in the poorer parts of cities and in country districts, believe that sickness is then more common. Now those who are well fed and well clothed and who have comfortable homes can be indifferent to cold weather and may even feel better, if they have a healthy constitution. It is another thing for those who are underfed, badly clothed, and who have cold homes. No constitution can overcome these. A glance at the children in the poorer districts at such a time will reveal this.

In birds and other animals and in nature herself the revival of life begins in January, though this is obvious only to a close observer. It increases most rapidly in April and May, and is over by the end of June. Then a quietness comes over the country, though it is months before there are signs of decay. From September this sets in rapidly and by November all things in nature are at rest. The change is seen in the hibernation of animals that begins in October and reaches its height in December. Surely it is not strange that there should appear in man similar variations in vitality. This was obvious to me long before I had given any attention to the study of nature, and to the solstice. It was evident in my surgical practice, where so many of the patients are over 60 with some affection of the heart or kidneys. In their convalescence the slightest thing counts. After operations they do better in the spring and summer than in the autumn and winter, even though in the latter seasons the temperature of the room is maintained at the same level. The wounds heal more quickly and complications are not so common. For this reason many surgeons prefer to operate during the former seasons.

In addition to the seasonal variations, it is probable that the time of the month has some influence upon health. The effect of the full moon upon those with mental disorders has been known since the time of Hippocrates. The air seems finer at the seaside at the time of the spring tide, and in the country when the full moon appears.

Much depends upon certain atmospheric conditions,[1] such as the height of the barometer [2] and the direction of the wind. Probably the latter has a greater influence than

[1] This reaction to atmospheric conditions is at times very strange. A friend, a strong and healthy man, tells me that whenever he has a headache, it means that snow will soon appear. Phenomena of this kind occur more frequently than is supposed in men of a certain temperament.

[2] Those conditions that cause the barometer to rise and fall may also have some influence upon the blood pressure and cause it to be raised or lowered. But so many factors come into play that it is impossible to be certain on this point.

the former. When the barometer is high there is usually a feeling of well-being, and when it is low of malaise. When it falls, old scars, fractures, and corns give rise to pain, and a mucous membrane in which there was an inflammation that has long subsided tends to become sensitive and even inflamed. But after a time the body seems to be able to adapt itself to a low reading, and the feeling of malaise and the pain pass off. On the other hand, if the barometer remains high for too long there comes a time when the feeling of well-being passes off and there is the longing for a change.

A wind from the north or east is more piercing than one from the south or west and is less well tolerated by an invalid. The worst of all is the north-easter. When the effect of a wind is being estimated, that which comes from over the sea must not be confused with one from off the land, which is due to an anticyclone. The east wind is an example. Coming from over the North Sea it is peculiarly piercing in the spring, and any deviation towards the north adds to its intensity. For the invalid there is no more trying wind than a north-easter at this time of the year. Even before getting out of bed many are able to say that the wind is in this direction, for it affects the mucous membranes, and the mouth and the eyes feel dry. There is a tingling of the skin, and those who have one that is normally sensitive to shaving know the added discomfort at such a time. The wind also has some action upon the nervous system, for work at this time is more trying and some persons are more irritable. In the country the flowers and leaves look dry and tend to shrivel. Animals are inactive and birds become quiet and cease to sing. Everything in nature is held back. There is undoubtedly some action upon those who are ill, for they are quieter and seem to have less vitality.

Those who have chronic bronchitis find that this lights up when the north-easter blows, even though they remain

indoors. This shows that atmospheric conditions act quite apart from any change in temperature. For indoors this can always be maintained at a certain level. Most tuberculosis officers are convinced that when the wind is from the east or from the north, chest cases do not do so well.

The east wind due to an anticyclone must be differentiated from the north-easter. It is usually associated with warm and pleasant weather, and is not in any way trying. But should it continue too long it may lead to much enervation.

A wind from the south or the west is pleasanter for those of delicate constitution. Flowers and trees are then at their best and animals are most active. They seem to love these winds, when they do not blow too strongly, if the weather is not too cold.

The state of the weather undoubtedly influences the state of well-being. The improvement that follows warm and sunny weather is obvious to all. But if this is too prolonged, it may do harm. After a spell of hot weather the whole country appears dry. Animals and birds are less active and less song is to be heard. When the rain comes, everything livens up. The song of the birds becomes more abundant and animals that were resting under the hedges go into the middle of the fields. The change in the flowers and trees is very evident. This might be attributed to the effect of the moisture ; but no matter how much a garden is watered, the flowers never have the same appearance as after even one shower of rain. It is not merely that it brings moisture ; it seems that it washes something out of the air. And this change in the atmosphere is communicated to man, for many feel better. It is noticeable among patients who remain indoors. Some men dislike the rain because it prevents them from taking exercise. But rainy weather can be beneficial to man. It is only when it is prolonged and incessant, or if it is combined with cold and a long absence of sun, that it becomes depressing.

This action of the weather is largely a personal matter, for it does not seem to affect any two alike. So much depends

upon the constitution. It is the hypersthenic and particularly one with a tendency to plethora who does not mind the north-easter ; it is the hyposthenic who longs for the southerly wind.

This personal element was brought home to me a short time ago during a trying north-easter. Going along the street one morning, feeling cold and miserable, I met a man of 77. To my opening remark that the weather was perfectly atrocious, he boisterously replied that it was the first time that year that he had felt well. But he was born in Aberdeen and had lived for years in Edinburgh. This indifference to an east wind is often noticeable among those who come from those parts. Is it that residence in a place adapts the constitution towards the prevailing conditions, or is it that those who are delicate do not survive infancy when brought up there ?

The Hippocratic school gave rise to the humoral theory of disease. It was assumed that all diseases were due to excess or defect of one of the four humours—yellow bile, black bile, blood, and phlegm. The physicians of a later period believed that the planets exercised some influence over each person and this was shown in his physique and temperament. This view was held up to the time of the Middle Ages and gave rise to the astrological theory. It was said that a man came under the influence of Jupiter, Saturn, Mercury, Mars, or Venus. This affected his mental make-up and gave rise to the jovial, saturnine, mercurial, martial, and venereal temperaments. As the sun and moon were at that time regarded as planets, the solar and lunatic temperaments were spoken of. It was believed that the influence of the planet was exercised through the humours, the amount of which would vary with its position. This was later discredited, but it is possible that there is more in it than is now thought. Even if the theories of these old physicians were wrong, it is unwise to reject their observations ; for they were accurate observers and their minds were not confused by much that now takes up our time.

The influence of the sun on both the mental and physical well-being has been proved in recent years. It also seems that the season, the barometric pressure, and the direction of the wind have some influence upon the health. It is possible that their action is directly upon the nervous system, as a result of which there is some modification in its power to conduct impulses. The effect takes place immediately, and is seen among the aged and those who are ill as well as those who are fit. Consequently, it is probably not dependent upon some reaction with the constitution but to some change that is produced directly in the lipoid of the nerve cell. The action of fresh air, sunlight, exercise, and bathing is modified at these times. As they affect the nerve energy, any alteration in the conductivity of the nervous system would modify their action.

There is little doubt that the energy of a man varies with the season, the barometric pressure, and the direction of the wind. When these change he can become more saturnine, jovial, or mercurial according to his original temperament. Certain states are therefore likely to be predominant at certain times. Now the planets appear at certain seasons and are likely to be associated with certain forms of weather. If the season and elements are substituted for the planets and nerve energy for the humours, there is possibly much in the Hippocratic teaching that we should ponder over to-day.

CHAPTER VI

THE STUDY OF NATURE

DURING the first year of the War the good health of the troops made a great impression upon me. This I attributed to their being in the open air. It seemed that the more a man exposed himself to the elements the healthier he became. On my return from Gallipoli I discussed this with my father, who, having spent all his life in a mining village, knew his workmen intimately. He was a very close observer of men, and had the advantage that their parents and children were also known to him ; he was thus able to keep in touch with successive generations. He was extremely doubtful of the value of exposure throughout the year and referred to the tramp, who was healthy enough so long as there was no work, but who cracked up immediately this was provided. It was his impression that miners who spent much time in the open air were not the best workmen. Though they looked fitter, they did not seem to go through life so well as the men who put their work first. He had noticed that in summer the colliery horses that were kept in the fields at night did better work than those in the stables. Their coats seemed sleeker and their muscles firmer. But once the nights became cold the horses in the stables were much the fitter. As I was somewhat dubious, it was suggested that I should select five which should be kept out in the fields in the autumn—though at the same time it was pointed out that my theory would be put to a practical test, as the ostler who had to have the horses ready for work, and the haulier who brought out the coal, would not hesitate to express their views and were not likely to be influenced by the theories of science. These five horses were given more corn and were well groomed. Though they had a place in which

to shelter and the autumn was by no means severe, at the end of three weeks the one thing I was thankful for was that horses could not speak. There was no question that they were not so fit as those that had been kept in the stables. It was pointed out to me that many of the men I had been thinking of were for the first time well clothed and well fed, and these were as important as fresh air. This lesson unfortunately did not get home.

A year ago, when spending a holiday in mid-Wales, I was doing my three miles constitutional before lunch on a hot summer's day. Stopping by the side of a mountain to chat with a shepherd, the question of the weather cropped up. I told him that it was most trying and oppressive and that I was feeling its effect very much. He pointed out that the animals always rested in the shade during the hottest part of the day and in hot weather took very little exercise. He had noted my movements for several days, and could not help feeling that were I to take a lesson from them it would be to my advantage. Resting up for the next few weeks during the hottest part of the day, there was a definite improvement in the sense of well-being. More was learnt from an observation such as this than from many years of routine work in the laboratory.

A man does many things because he thinks they do him good, whereas they do him harm all the time. His perception of slight changes in vitality is not sufficiently acute for him to appreciate this. And our means of ascertaining the state of health of others are not sufficiently accurate for anyone to be certain as to what takes place. Everyone is influenced by habit or by his own or other people's suggestion and is liable to do something because it appeals to his senses and does not really benefit his health. By studying nature it might be possible to control our observations on human beings and have information on points about which we are now uncertain. Animals are governed in their activities largely by their instincts. They are, moreover, extremely responsive to atmospheric changes, and by watching their

behaviour some can foretell the weather with more accuracy than any barometer. Some of the remarks that follow in the subsequent chapters are bound to be erroneous, for I have been an observer of nature for too short a time. Others were just chance observations made in past years, and time has not given the opportunity to confirm them. They are put down so that those who are better qualified to speak might give their help and so guide any who may feel inclined to take up this line of work. The colliery horses to which reference is made were working in mountain levels. They walked up each day from the stable about a mile distant, so that the conditions under which they worked were somewhat similar to those of the miners.

The advice of others has been sought, but it is not easy to come into contact with people of the right type. So few seem to have observed nature in order to come nearer to the meaning and the purpose of life and to find out what are the effects upon animals of those factors that are supposed to be essential for our own health. Much help may be obtained from the chance remarks of shepherds or keepers. They are so often acute observers, whose one aim is the welfare of their flocks. The views of innkeepers in small country villages who are observers of nature have the advantage that they are often tempered by a wide knowledge of men. It is surprising how uncertain they are in spite of their great experience. But from such men it is always possible to learn. As a man studies nature face to face with life he begins to realise how insignificant are the achievements of science. When he ponders over the migration of birds and of fish such as the salmon and eel, our invention of the aeroplane and of the submarine appears so small. For the swallow each year flies some thousands of miles with nothing but instinct to guide him, and the Arctic tern migrates from pole to pole. It is possibly on account of this that the student of nature becomes so humble. He is only too aware that the work of one generation may be set at naught by some chance observation in the next, so strange a thing is life.

CHAPTER VII

ACCLIMATISATION

YEARS ago, when children were taken to the seaside, it was the custom not to allow them to go for long walks during the first few days. No bathing was allowed for the first two days, and then only for a few minutes on the first occasion. It had been noticed that children did not do so well when this was not insisted upon. It was assumed that it was better for them to get used to the air before entering the water. This was my first introduction to acclimatisation. It is, however, a matter of great importance to those who react so markedly to slight changes.

On first going to the Alps some shortness of breath and rapidity of the pulse, which may persist for some days, are not uncommon. In those who are not well this is particularly noticeable after exertion. The heart and lungs do not seem able to adapt themselves to sudden changes in altitude. This probably applies to the constitution in general, for quite healthy people feel much fitter if they take things quietly at first. It was interesting to watch experienced mountaineers arriving at Zermatt. Many rested for the first couple of days, especially those getting on in years. Some of the younger men did not do so. Their vitality allowed them to adapt themselves to most conditions. On going up to the Gorner Grat even they found themselves short of breath, though they quickly recovered when they rested. The dyspnœa was more persistent in those who were not so young, and some were relieved only when they returned to Zermatt. It seemed that for otherwise healthy people this extra 5,000 feet was too great a strain.

Sudden ascent to a high altitude may cause a disease to flare up. For instance, a quiescent tuberculous lesion in the lung may become active. When going to a sanatorium situated in such a place, it is advisable to go gradually, and to take several halts on the way. This not only avoids the fatigue of a long journey, but is much safer, as it allows the constitution to adapt itself to the varying altitude.

An innkeeper in a mountain spa in mid-Wales thought that the people who obtained the most benefit from their stay were those who rested for the first few days after arrival and who took exercise only in moderation. He had noted that many who came from low-lying cities often played more golf than they did at home. This he attributed to the air being more bracing. But if they became ill during the winter, it was not uncommon to hear that they had died or that the illness was prolonged and they showed a tendency to crack up. He thought he could tell what the outcome of such an illness would be according to whether they had rested or taken much exercise during their stay ; for those who rested did much better.

Those who go to the south of France feel tired and languid for some days after arrival, which is attributed to the strain of travelling. It cannot be due entirely to this, for it occurs if the journey is made by air ; and travelling by air does not shake up the system to the same extent as a journey on our best trains and in itself is not tiring. It must be due to a sudden change in latitude. This is not noticeable, however, when flying from Marseilles to London. The different result may be due to the bracing action of the air of the more northern zone or to fatigue being less evident when the health is improved at the end of a holiday. Even then one seems to feel better if things are taken quietly for the first twenty-four hours. Nor is fatigue noticeable when going from east to west, or vice versa. For when flying from London to Berlin, it is surprising how fresh one feels on arrival. It seems as if going to the seaside or up into

the mountains or any sudden change of latitude[1] throws some strain upon the system of even healthy people. How much more will it affect those who are not well!

[1] When birds migrate, it is probable that they are guided by a sense of latitude. For the farther north a bird nests, the farther south does he migrate. For instance, the Arctic tern goes to the Antarctic. This sense has almost entirely disappeared in man; though if there is anything in this relation of latitude to a feeling of fitness, it is possibly only lying dormant.

CHAPTER VIII

CHANGE OF AIR

THERE is no question that a change of air does good. At the end of a day in the city in summer a man is tired and weary. On going to his home in the suburbs he immediately feels revived. This is not merely due to the rest, for it would not have come so quickly had this taken place in the city. In the midst of the summer many people feel worn. A week-end by the sea restores and refreshes them. Because of this the week-end habit began. The value of a holiday in the summer had been appreciated for many years before. It has been recognised through the ages that a change of air may be of great value to a man who has been ill, and a little time spent by the seaside can do more good than all the medicine in the world. For instance, a wound refuses to heal or the general condition hangs fire in spite of all forms of therapy. Yet if the patient is transferred to some other place, an improvement may immediately occur. This is attributed to the change of air, but how it acts is still a great mystery.

The change improves the general health and increases the resistance to disease. It is not certain how this comes about. Probably some reaction takes place with the constitution and starts some change that makes all the difference to the health ; this may continue long after going away. It seems as if some powers that were lying latent have been stimulated.

In considering the value of a change of air it is important to differentiate between a prolonged and a short stay. For if, as seems likely, the effect is brought about by some reaction with the constitution, it is possible for this to take place for a short period with benefit, while a continuation of the same air may lose its effect and do harm if the time comes

when the constitution can no longer respond as owing to continued stimulation it is worn out. It is possible even for a healthy man to wear out a climate. Hence people who live in places by the sea or in the mountains are much improved on going to places in the plains or inland, which are not generally regarded as health-giving. If a climate can do harm to a healthy man, this will apply all the more to one who is not well.

An old shepherd told me that it was the custom many years ago, when stock was more valuable than it is to-day, to take sheep and cattle to the seaside for a few weeks in the summer. There was, at first, considerable benefit ; but if the stay was too long, the effect seemed to wear off. He thought that in those days he had less trouble with the stock in winter. It is found that stock sent into the hills for a short time during the summer are benefited by the change. But, if they are going to keep them for any length of time, farmers prefer not to buy cattle from down-stream, that is to say, animals that have been born and bred at lower levels. They do not do so well. This seems to show that even with animals as with man some care has to be taken when a change of air is contemplated, particularly if the stay in the place is for any length of time.

With men something more than the change of air may have to be taken into account, and often it is difficult to know to what to attribute the improvement. This was brought home to me from an experience with the South Wales Borderers in Gallipoli. The men had had a difficult time after landing in June. They had suffered from dysentery and jaundice. By December their health was poor and 50 per cent. should have been in bed. Many had colitis, gingivitis, and chronic ulceration of the skin which showed little tendency to heal. After the evacuation of Suvla Bay on December 19th they went to Lemnos. When they paraded on December 26th to proceed for the evacuation of Cape Helles they were a different body of men. In that short time the muscles had become firmer and of better tone, the eye was becoming clearer, and the general health

improved in every way. With many the gingivitis and colitis were disappearing and the ulcers of the skin were tending to heal. Had I not witnessed this I could not have believed that so marked a change could have occurred in so short a time. The food over the whole period was good, so the improvement was not due to this. The air in Gallipoli was by no means so bad as is commonly supposed, and in peace time the climate would be healthy and equable ; and there was little difference from that of Lemnos. Of more importance was the rest the men were able to obtain. For it was the first time for months that they were able to sleep properly and were no longer confronted with the constant anxiety and strain of trench fighting. Some of the improvement must have been due to this. In the same way, when removal to some new place leads to an improvement in the health, other things than the change of air may need to be considered. The new surroundings may lead the mind into a new line of thought that results in worries seeming less. The change of scenery may by itself lead to relaxation. These are some of the advantages that come when a move can be made.

Little is known why one place should be healthy and another unhealthy. It is to some extent dependent upon subsoil drainage and altitude. Where the former is good, there is less liability to catarrh and chronic infections, and work can be done better. Somehow increased mental and physical activity seems to result. A good subsoil drainage must be distinguished from a good surface drainage. Cardiff, for instance, has a good surface drainage, but, being a city largely reclaimed from the banks of three rivers, its subsoil drainage is poor.

When the subsoil drainage is poor, the place is generally unhealthy and predisposes to the chronic infections. It also tends to produce a feeling of malaise. This particularly applies to marshy lands, and is most marked on those sultry days in summer when the sky is overcast and nothing in nature seems to move.

A place that is situated high is generally healthier than a place in the plains, but this applies only to inland places, for most seaside places lie very low and it does not seem that the ones high up in the hills near the sea are healthier than those that lie at sea-level.

But two places may appear to have the same type of soil and be at the same altitude. Yet one may have health-giving properties and the other none ; and it is found that, if two patients with the same type of disease go to the same place, one may get well and the other remain stationary or get worse. Notwithstanding that certain climates have a beneficial effect on such conditions as rheumatism and bronchitis, it seems that the health-giving properties of a climate are due not to some direct action upon disease, but to some reaction that takes place with the constitution, though what this is and why it should take place we do not know.

It is possible that the nature of the air in a place depends upon certain electrical phenomena. Certain places represent silent areas for the wireless. Two silent areas known to me are depressing and unhealthy, and on the only occasion I have been near the Canaries there was a definite change in the atmosphere which was quite noticeable before it was pointed out that this was also a silent area for the wireless.

When the action of the air of a place is considered, two difficulties have to be faced. It is often very limited in its extent and this limitation is difficult and at times impossible to define. For instance, it has been known for years that a person who suffers from asthma may remain free on one side of a valley, whilst a visit to the opposite side may precipitate an attack. This was brought home by the experience of a medical man. An old wound of the lungs lighted up after the War and gave rise to a persistent cough and much loss of weight. He went to Switzerland to recuperate and stayed at several Alpine resorts. His condition became worse and at the end of six months it appeared hopeless.

He decided to go to Davos, though by that time all his faith in the Alpine air had been lost. The first night he was there the cough ceased and he felt better. He began to put on weight and in a few months had regained his former health. He was able to ascertain that the beneficial effect of the air was limited to an area about three-quarters of a mile long, and was in the village and not on the heights around. If he stayed outside this area the cough returned. It was many months before he could stay away from Davos without this happening. For years afterwards when the cough recurred, he returned there and found that even twenty-four hours brought relief. This was not obtained from other Alpine resorts, though these were also visited on many occasions. Thus for this man the air of Davos was ideal. I do not intend to compare Davos with other Alpine resorts, for whether the air of a place agrees will depend on the constitution, and therefore it will benefit some and not others.

In this country the climatic conditions can also vary within a few miles. For instance, the air of Torquay is relaxing, that of Paignton, only a few miles away, is bracing. It is not possible in the course of a lifetime to get to know many places intimately. Porthcawl, a bracing place on the south coast of South Wales, is well known to me. The air is very bracing, particularly when the wind blows from the west or south, and this is most marked when the south-westerly wind comes from right over the Atlantic. This bracing air is limited to an area of three miles. It ceases on the east side just before coming to the village of Newton, which lies lower, and the air of which is very relaxing ; in the spring the gardens are usually six weeks ahead of those in Porthcawl. On the west side it ceases just before coming to the farm of Sker. In coming from Cardiff by road over Danygraig hill this air is not picked up until the town is entered. On coming by rail it is picked up at Pyle station. As one enters from this direction, the air becomes more bracing as the village of Nottage is reached, though even here it is not so bracing as in Porthcawl. For some time it was my impression that this limitation was due to the Gower

peninsula intervening between the western part and the Atlantic. Later it appeared to me, on viewing it from the eighteenth tee at Southerndown Golf Club, that Porthcawl was really a peninsula jutting out into the sea and the bracing air might be due to this. But neither of these would explain why this bracing air passes inland, for on journeying from Cardiff to Swansea by road, it is picked up at Pyle and extends westward for about four miles. It must be due to some atmospheric conditions of which we know so little. For when the rain clouds come in from the south-west to pass to the mountains inland, they are sometimes seen to divide before reaching Porthcawl; and during the severe snowstorm, which swept the whole of the country at the beginning of last year, Porthcawl was not affected. A careful study of phenomena such as these might help us to elucidate some of these points. For some years before the War, when on a walking tour over the Downs with some friends, we found ourselves at the end of a day weary and tired. Suddenly over a distance of a mile we all livened up. It was difficult to account for this, but a few days later, when returning in heavy rain, there was none over this part.

Richard Jefferies writes as follows[1]:

"If you have been living in one house in the country for some time and then go on a visit to another, though hardly half a mile distant, you will find a change in the air, the feeling and the tone of the place. It is close by, but it is not the same. To discover these minute differences which makes one locality healthy and home happy, and the next adjoining unhealthy, the Chinese have invented the science of Feng-shui, spying about with cabalistic mystery, casting the horoscope of an acre. Bird's-foot lotus means a fortunate spot, dry, warm, so far as soil is concerned. If you were going to live out of doors, you might safely build your kitchen where you found it."[2]

[1] *The Open Air*, p. 35.

[2] Farmers know that animals will do well in one field and not in another. This is attributed to something in the soil, for crops will grow well in one soil and fail altogether in another. But no matter what attention is given to the soil, no improvement may follow. Is it not possible that it is due to some local atmospheric condition that we are now unable to appreciate or to control?

It is not possible for many to appreciate this subtle change between adjoining places to such an extent as this. But where the bird's-foot lotus is found, even those with rheumatism and bronchitis may safely lie down on a warm day. Where the roses bloom so beautifully is often a bad place for them to reside. For these grow best on a damp clay soil.

For practical purposes the air of a place may be regarded as a modification of one of the following :

1. Bracing air by the sea, as is found at Porthcawl, Aberystwyth, or Newquay (Cornwall).

2. Bracing air in the mountains, such as Llandrindod Wells or Buxton.

3. Relaxing air by the sea, such as Penzance or Tenby.

4. Relaxing air inland, such as Woodhall Spa or Bath.

Bracing air by the sea is different from that of the mountains. A bracing air by the sea may suit some people when that of the hills may make them worse. They both seem to improve muscle tone and to stimulate the appetite. Though both may lead to insomnia and irritability, this is far more likely to arise with the former and is particularly noticeable in those with incipient hyperpiesia. The latter is apt to lead to hypertonus of the gastro-intestinal tract and gives rise to nausea and vomiting. It is particularly noticeable in those who have a tendency to hyperchlorhydria.

On first going to a bracing place the stimulation may be intense, and may lead to loss of sleep. It may be asked whether this does not counterbalance the beneficial effect of the air. Loss of sleep in a bracing place, however, is not felt to the same extent as loss of sleep in a relaxing place.

A relaxing place has a sedative effect. As a rule it does not produce that improvement in muscular tone found in a bracing place. It tends to tone down the nerve energy and there is a tendency to put on fat. On first going there a man may feel slack and off-colour. The appetite becomes poor and there often comes over him a feeling of malaise. If he rests and takes things quietly, this will pass off in a couple of days. For the overworked a visit to a relaxing place may

be most beneficial, as it will compel them to take things quietly and build up energy to face the months ahead. Whereas a visit to a bracing place would have led to such a sense of well-being that they would have been reluctant to rest. Some patients tell me that they feel better for living at Porthcawl where the air is bracing, and spending the day at Newton where the air is relaxing. Others feel better for spending the night at Newton and the day at Porthcawl. Some again prefer Nottage, which is more bracing than Newton and not so bracing as Porthcawl. My opportunities for investigation have been so few that I have not been able to form any definite conclusions. But it can be said that a bracing place increases the nerve energy ; a relaxing place decreases it. Whilst the majority of people can adapt themselves to either, it seems that those of the hypersthenic type are ultimately benefited by going to a relaxing place ; those of the hyposthenic type, to a bracing place.

Much, however, depends on the state of health at the time and whether the visit is an attempt to produce a feeling of well-being, to overcome a temporary malaise, or to improve the health to face the months ahead. For if the hypersthenic is off-colour, his energy is somewhat lower than normal and for the time being he will be benefited by a bracing place ; if the hyposthenic is irritable, he will be benefited by a relaxing place.

As the constitution alters with the passing of the years, it is not uncommon to find that a climate that seems to agree well at one period of life may have no effect at another. Those who are in difficulty should try to find out what suited their parents. Very often both went for their holiday to the same place, for romance so often begins at the seaside. Whether it is due to this or not I cannot say, but the place that will be found to agree with a person as he grows old is sometimes the one to which his parents first went and where he was taken as a child.

The value of the home air has been lost sight of. Years ago it was the practice to send people, particularly as they

grew older, back to that place where they spent their early years. Some consider that the good effect is due to revival of the memories of boyhood and of early aspirations. But it is more than this. For the air in which the boy grew up must have had a marked effect upon his constitution. And when this becomes impaired in later years, a return to the old air may still have a beneficial effect when all others fail. If this is not possible, one of a similar kind may be advised instead. For instance, if he were brought up in the hills, he should return to the hills, and, if possible, to a place of just the same altitude.

Though the constitution that a man acquires largely depends upon inheritance and upbringing, the air of a place plays a minor rôle. Those who are brought up in the mountains or by the sea develop a constitution and qualities that are the envy of the people of the plain. The more northern a race, the more difficult for its people to adapt themselves to the tropics for any length of time. To retain health they must return to their own country every few years. If this is not possible some impairment of the mental and physical qualities is likely. It is always advisable for their children, born in the tropics, to return to their native country. If this is not possible few families go through two generations without showing stigmata of degeneration.

People have come to think too much of sunlight and the open air. They dash to a place to get a few hours in the sun. The night air by the sea or in the country is often beneficial. Somehow it seems to improve the sleep. Strangely enough, sleeplessness by the sea or in the country is far more tolerable than sleeplessness in the city or in the hills. People should keep in mind some place within easy reach where they can spend the night. If the journey can be undertaken at ease when the work is finished, much benefit often follows even one night away. In this way it is possible to have twelve or more hours of this air ; for if the window is kept open it penetrates into the rooms the whole time. This going away for an occasional night is different

from residing at a place an hour or more from one's work. For the catching of the train in the morning and evening becomes monotonous and trying and often undoes the good of the change of air.

The places on each side of the Bristol Channel form an ideal ground for investigating the effects of climate upon the constitution. For those who can travel by sea have available within a small radius all varieties of air. To begin with, there is a rise and fall of the tide of 40 feet, which means even in sultry weather a big movement of the air twice a day. The places on the east side have a different geological structure from those on the west, and a different air. In the former, north-east of Hartland Point, the climate is relaxing. South-west of this it is bracing. On the northern side places east of Worm's Head are very bracing ; those west of it are very relaxing.[1] Ilfracombe has a very fine air which is neither too bracing nor too relaxing. It is an excellent centre for the convalescent. South of this, at Newquay, the air is most bracing. As one goes eastwards the air becomes more relaxing. At Lynmouth the air is fine, if it is not too hot. Minehead has a relaxing air, midway in effect between that of Lynmouth and Weston. Weston is well protected from the north and east winds and has a fine relaxing air. Clevedon has a relaxing air and is well protected from the east wind. At Lynmouth and Lynton there is the advantage of being able to test the air of the seaside at different altitudes. Relaxing air in such a place, where the mountains come right up to the sea, is somewhat different even in summer from the relaxing air of a more open place such as Weston. In addition, in the winter the weather is rough and quite unsuitable for elderly people and for those who suffer from rheumatism and bronchitis. On the north-west side Porthcawl has a most bracing air. As one goes eastwards along the coast, this air does not appear to be picked up again until Barry is reached on the east and

[1] This difference in the air is to be found inland. For that of Exmoor is different from that of Dartmoor. If places of a similar altitude are chosen, it will be found that the former are more relaxing. In South Wales the air of the districts lying to the west of the river Towy is relaxing ; that of those to the east is bracing. This year when the change in the leaves was apparent very early to the east of the Towy the country to the west looked quiet and green.

the Gower coast on the west.[1] The Mumbles near Swansea is relaxing, but the other places on the Gower coast are bracing, though not to the same extent as is Porthcawl. Tenby is a place of great charm with an equable temperature and a relaxing air. For those who may wish to seek a relaxing air inland, there is the trip up the Avon to Bristol, from which it is easy to reach the city of culture and charm, Bath. For those who prefer the enclosed air of a low-lying place which is relaxing, there is the beautiful valley of the lower Wye. From Cardiff it is easy to reach Llandrindod, Llanwrtyd, and Builth, spas with mineral waters lying at different altitudes and having a different kind of bracing air. From Ilfracombe it is easy to reach the village of Dartmoor, the air of which is bracing but quite different from that of the Welsh hills.

In this country there are many admirable institutions for the study and treatment of disease. Those devoted to the regaining of health, when they are not associated with some stunt, are often of minor importance and are quite inadequate. Had a number of convalescent homes been set up in various places for the treatment of those who were ill but not suffering from any known disease, and had they been run by one central authority with the power to transfer patients from one place to another, it might have been possible for some by now to come to grips with the constitutional factor underlying ill health and to speak with greater knowledge about the influence of change of air upon it. It is doubtful if any place in the world is so admirably suited for this purpose as these resorts situated on each side of the Bristol Channel, for within a small radius there are so many kinds of air. It is unfortunate that when medical research came to be organised in 1912 no attention was given to the study of the constitution.

[1] This Barry air is also picked up inland by the common above Cowbridge and extends for five miles eastwards of this along the Cardiff road.

CHAPTER IX

FRESH AIR

It is unfortunate that living in the fresh air is confused with exposure, for it is now the practice not only to put the patient in the open but at the same time to take off his clothes and expose his body to the sun and air. The play of the cool air upon the skin is supposed to stimulate metabolism. Now this implies some reaction upon the part of the constitution, and whilst most people benefit by inhaling fresh air, such exposure is too drastic for many who are not well, particularly if they are getting on in years. They may not be able to react.

It is well to realise that there is a difference between a draught and fresh air. Plenty of people are immune to draughts, and are extremely fortunate to have such a constitution. But quite a number are not, for a draught playing upon the back of the neck, lumbar region, or the lower third of the leg gives rise to a common cold or to an inflammation of the underlying muscles. Nothing they do is able to prevent this, though strangely enough a draught playing upon the front of the body has not so marked an effect.

Fresh air does good to most people, though it is not known how it acts. It is often stated that as fresh air is purer than the air of a room, more oxygen will get into the blood, the metabolic process becomes more active, and the vitality is consequently increased. But living is not quite so simple as this. Probably fresh air causes some reaction with the constitution, the nature of which we do not understand. It seems somehow to increase the nerve energy, for people feel more active mentally and physically when able to go into the open air. Fresh air is of value to the hyposthenic who

has too little ; but he may not be able to respond, in which case it may do harm. For this reason it is not advisable to keep those who are old, weak, or ill too long in the fresh air. On the other hand, the hypersthenic has already too much energy.

It has yet to be proved that remaining in the air for the twenty-four hours and in all seasons is to the advantage of man. It is said by those who conduct sanatoria that patients who remain out all the time and in all weathers do better than those who do not. They forget that only those who have a good constitution can stand this. Otherwise they would be driven indoors. Such patients will get over tuberculosis even when working in the middle of the city. I have never been able to believe that this exposure in all weathers is essential or even advisable. Those who remain out in all weathers look fitter at the sanatoria, but they are generally those whose health is robust. But often when they go back home to the conditions of ordinary life they crack up. It seems that their constitution is such that it can adapt itself to one state but not to another.

It will eventually be found that too much fresh air is not so beneficial as is thought. The tanned complexion from exposure to the sun and the high colouring from exposure to the winds are not quite the same as health. Those who possess these seem robust enough until some illness comes along or a period of strain. Then they may crack up in an extraordinary way.

Much that is attributed to the fresh air is really due to a change in the temperature, to certain atmospheric conditions, or to the season of the year. For fine weather in some way increases the vitality ; and therefore men feel better and go out into the open air. When the north-easter blows, men feel that it decreases their vitality and those who do not feel so well remain indoors. They only think they would be better if they could go out of doors ; but generally they would not.

The colliery horses that were fit and took their food well were certainly better when they were left out in the fields in the warm summer nights. Then there would be no inclination on their part to go back into the stables. The moment it became cold they were anxious to get back. The ostler was definite that even the fit horses were better for being in the stables the moment the weather became cold. Those that were sick or off colour crowded around the entrance to the stables soon after they were put into the field ; this was particularly marked if it was cold. Animals that are sick do not seek the open air. They prefer the shady warm spots and are apt to cover themselves with anything that lies about. They tend at this time to keep even the heads covered. Shepherds and ostlers are convinced that it is not exercise and fresh air that animals need in autumn and winter so much as comfort and warmth.

CHAPTER X

THE SUN

WHEN the sun appears in the spring it gives rise to a feeling of well-being and work is done much more cheerfully. A man becomes more vivacious, his mental faculties are more active, and his health is improved. Resistance to disease is also raised and the whole system seems toned up. The sun has also some effect upon the muscles. Years ago wasting was a feature of tuberculous joints and persisted long after the disease had subsided. But if such a joint is exposed to the sun, the muscles do not waste. By no other treatment can wasting be prevented.

On the other hand, too much sun may do harm. For after a spell of sun in the summer, work is done less well, particularly if the weather becomes oppressive. This is put down to the effect of the heat ; but it is noticeable, though to a less extent, in sunny weather even when the temperature is not unduly raised. Consequently it may be asked if the present tendency to bask in the sun is wise. Too much sun may act injuriously on the nervous system and lower the resistance to disease. This may not be apparent at the time, but it becomes so during winter, particularly if this is severe and some illness arises.

Over-exposure not only leads to sunstroke and to burns, but may give rise to a feeling of fatigue, lassitude, and irritability. These are due to its action upon the nervous system. This is responsible for the restlessness seen in young children who are kept too long in the sun. Those who have spent much time in the tropics sometimes show mental impairment and a want of tone. They are often poor subjects for operation, for complications are more common ; they seem to have so little reserve force. It is

as if the sun has in some way undermined their nervous system.

Too much sun or too sudden an exposure may lower the resistance to disease, as the following instances show. In Davos a sore throat sometimes occurred in new-comers in the days when patients exposed themselves to the sun from the start. Occurring in such a healthy place where the conditions are ideal, the only explanation is that too much sun in some way impairs the health. This may be seen in pulmonary tuberculosis, which not infrequently flares up. Some say that the exposure activates the disease. This is not so, for sun does not increase the virulence of bacteria, but it may lower the resistance.

During the fine weather which came on suddenly in August 1932, some of the men in my hospital preferred to remain on the balcony all day in the sun. Three developed a severe tonsillitis, which in two went on to suppuration. These men were previously quite fit, two being treated for fractures and one for a hernia. It seemed that over-exposure to the sun had in some way lowered their resistance to infection. Epidemics of infectious diseases are not uncommon in early summer. In recent years tonsillitis and inflammation of the ear have been very prevalent when there has been much sun early in the year. This is possibly due to the modern tendency to expose children to the sun as soon as it appears and before the health has had a chance to be built up, which normally occurs when the weather improves. Over-exposure to the sun at a time when the body is not able to respond, and therefore the resistance is lowered, is probably responsible for these outbreaks. Possibly some of the ill health now so prevalent in winter is due to too much exposure in the previous summer.

The action of the sun varies with the weather, the season, and the place. At high altitudes it braces up the body. At low altitudes, such as the South of France, it tends to be enervating. But this is not entirely a question of altitude, for in some Alpine valleys which are very high the sun may

still be enervating. Certain atmospheric conditions come into play, and more important than the intensity of the sun is the nature of the air. If this is bracing the action of the sun is more beneficial ; for the sun can be better tolerated and seems to do more good where the air is bracing. The sun inland may be enervating, whilst a few miles away at the seaside it seems to tone up the system. This was at one time attributed to the increased power of the rays of the sun due to their reflection from the surface of the water, but the sun at the seaside may have this action and yet it is absent in the middle of the ocean. For at the seaside there is the advantage of the flow of air due to the rise and fall of the tide. It is unlikely that the bracing air has any action upon the rays of the sun. Probably it produces some change in the constitution as a result of which a more effective response to the sun is possible. This applies also to bracing weather. In surgical tuberculosis the sun is most beneficial, and the patients look better if treatment is carried out at a high altitude or at the seaside. The effect on the muscles then seems more marked. Again, the sun is not so beneficial in July and August as it is earlier in the year. At the former time it tends to be enervating ; at the latter, more bracing. The prolonged action of the sun is not always beneficial ; and in a spell of fine weather it does not seem to do so much good as when it is alternated with the rain.

Much about the action of the sun may be learnt by studying nature. Animals and birds love the sun in the spring and autumn. They go to the highest pastures, particularly when the weather is about to improve, as if to anticipate the coming of the sun. But when the weather is hot and oppressive they seek the shade. It is in the early morning before the sun is shining strongly and in the evening, after it has set, that they wander in search of food. At the dawn birds sing most beautifully. After the sun sets their evening chorus is resumed. At noon and for some hours afterwards a quietness comes over the countryside that is particularly noticeable in sultry weather when the sun shines. Whilst swallows and some of the other migrants are as lively in hot

summer weather, our native birds, such as the thrush, the robin, and the wren, become quieter. But when a shower of rain has cleared the atmosphere, they are the first to respond by an outburst of song. Does the swallow correspond to the coloured races who love to bask in the sun, whilst the thrush and wren correspond to the more northern races that do not appear to need so much? In the early spring the leaves of the trees have a tender green colour, but as the summer progresses they become dark and stiff and impenetrable as if making an effort to protect the tree from the sun. This is more noticeable where the trees lie in the valleys. Where they are on top of hills and mountains it is less marked. It seems as if they react to atmospheric conditions in the same way as man, and as if they find the sun on the mountains, where there is a movement of air, more tolerable than that in the valleys where this is absent. In prolonged sunny weather, the flowers tend to droop and look dry, so do the leaves of many trees. On the other hand, they brighten up when rain comes and the sky is cloudy, provided it does not become cold. There can be no question that too much sun is just as harmful for many animals and plants as too little. This applies equally to man.

Exposure to the sun may do harm even if it is moderate in amount. This is soon apparent in those who are not well. A common cold in the summer becomes much worse on going into the sun and, so long as this persists, is difficult to cure. Those who are ill prefer a dark room. When there is any fever, the sun undoubtedly does harm. If there is any mental disorder and the patient is inclined to be irritable, he becomes worse. Green rooms from which the sun has been shut out are to be preferred; they are far more restful. This is also seen in animals. When they are sick, they seek the shade and often bury themselves in the woods. Only in the spring, when the sun is not too strong, do they bask in its rays. Generally speaking it does seem better to keep those who are ill or irritable away out of the sun.

Thus there is need for care when exposing oneself to the sun. Too much sun will impair the health and lower the resistance. Any good the sun does is not due to something

it puts into the body, but to some response on the part of the constitution. It is that the metabolic rate and nerve energy are increased. But it may be that the response cannot be made or is too great a strain upon the constitution, and harm then results. This often applies to the hyposthenic, who is in need of nerve energy. The hypersthenic can respond easily enough, but already he has too much energy. Hence the explanation why the sun is harmful in the aged, the cachectic, and the sick. For though they are in great need of nerve energy, their tissues have not the vitality to make the response necessary for its production.

Some seem to think that because they feel better in the spring when the sun begins to shine, if they could expose themselves to its action right through the year it would be an advantage. But the beneficial action of the sun is to some extent seasonal, certainly in the temperate zone, and those who live in regions where the sun is always shining are by no means robust nor have they a great resistance to infection.

It was shown above that as the summer goes on and as the sultry weather increases, living things protect themselves from its rays. Their attitude now is quite different from that in the spring and they have to be prepared to go through the winter with little or no sun. Though the sun is essential for the production of energy, for growth, and the maintenance of life, too much is harmful. Is man therefore wise in trying to maintain artificially the application of sun-rays right through the year with a view to keeping up his strength? In years gone by men were content to utilise the energy the sun gave in the spring and summer not only to do their work at these seasons, but also to build up the constitution to face the months that lay ahead. In this way they conformed somewhat to the life of nature. When the home was good and the hours of labour not excessive, they remained quite healthy right through life.

CHAPTER XI

EXERCISE

EXERCISE in moderation is beneficial ; it keeps a man fit and healthy. It allows him to get rid of accumulated energy, so that he can turn to his work with a more composed mind. It seems to have some power to raise the resistance to infection, for such things as the common cold seem to be less frequent in those who take exercise in moderate amounts. Also, if taken regularly and in all weathers, it has a certain moral effect ; for it helps to develop self-discipline and self-control. But in recent years there has been a tendency to increased exercise. The playing of games and the taking of exercise hav come to be looked upon as essential to physical fitness, and much time is devoted to them. Many contend that it is not possible to do work well if exercise in some form is not possible.

On the other hand, is so much exercise advisable and should it be undertaken in all weathers right through the year ? This extensive playing of games has not been carried out for sufficiently long to be certain of the effect on the constitution. Only as games acquired a national and an international importance at the beginning of this century was so much interest taken in them. In 1900 the public schools had few inter-school games. They were discouraged because it was felt that they took the mind too much away from work. Rugby, which tested the wind and staying powers and got rid of superfluous energy, was played in the winter ; and cricket, a leisurely game that kept the boys in the open air, in the summer. There was a definite close season to each, for it was noticeable towards the end of the season that boys became tired and stale and in need of rest. But even before the War games were

being played to a greater extent, and still greater in recent years.

The men of the 1850 period, who had good homes, were as fit physically as those of any succeeding generation and yet they did not take regular exercise. In the mining valley where I was brought up, all the children went to the same school where, in those days, little attention was given to games or to physical exercises. Yet when the home was good and the children were not neglected, they remained quite fit. The majority of the boys went into the mines. Some went to the secondary schools and a few to the public schools. In those days few of the secondary schools had playing-fields and no games were played. The boys who went to the secondary schools seem to have as good a physique and to last in life quite as well as those who went to the public schools ; and if allowance is made for the dangers of the life, the miners were equally fit. The majority of boys in a public school played only the games that were insisted upon, and the rest of the spare time was used as leisure. Only a minority took an active interest in games. Of the boys who were at school with me, those who took little interest in games are going through life as well as, if not better than, the others. The fittest seem to be those who were inclined to take life quietly.

An innkeeper in mid-Wales was quite definite that men are taking too much exercise. He felt that it was harmful, particularly when they were getting on in years. Having lived for many years in a city, he had had a large circle of acquaintances with whom he had kept in touch. One evening he tabulated a list of those who had lived life leisurely and those who had continued to take exercise, which was usually golf. It was surprising to note the large number of the latter who were, as he put it, " bringing up the daisies," whereas so many of the former were alive and in good health.

That the desire to take exercise varies with the season is seen particularly in animals. For most living things there

is a season of activity and a season of rest. The flowers and the trees bloom and flourish in spring and in the summer; in the winter they sleep; in the cold grey days of November and December the life of the country is at its lowest ebb. Many animals, such as bats, frogs, squirrels, go into a deep sleep until the return of spring, and hibernation is much more widespread than is commonly supposed. Though birds do not hibernate, they become quieter during the winter, when they sleep for fifteen hours, whereas in the spring and autumn, their season of activity, they sleep for only six. Domestic animals have adapted their activities to the ways of man to suit his requirements. For instance, dogs follow the chase in winter, when they are exceedingly active, but for the rest of the day they lie quietly about. They show much more spontaneous activity in the spring and the early summer than in the winter months. During the winter the colliery horses show little tendency to exuberant spirits. They are not inclined to frolic about. But in spring and summer, when out in the fields or when returning from their work, they often go for a gallop or trot. The desire and need for exercise seem to vary with the season.

This is seen also in man. In spring and summer men desire to get out into the open and to take a stroll. But in autumn and winter they prefer to remain by the side of the fire. But to get his living it is necessary for man to work and consequently to take some exercise right through the year. Is it not possible that the Creator made up for man's inability to rest during the winter by making the seventh day one of rest?

A patient aged 55 tells me that, whilst he is certain of the value of exercise in spring, summer, and autumn, he is doubtful of this in winter, particularly since he has grown older. Whereas at one time he took exercise regularly throughout the year, since he was 40 he has given it up towards the end of November and has resumed it only about February. In the interval he goes out only when the

weather is quite favourable. In addition at this period he takes everything more quietly, rests as much as possible, and keeps his bedroom windows closed at night. If there is any tendency to put on weight, he eats less. He is convinced he feels better for this. From the end of November to January 1st he is inclined to look back on the year and upon life in general. From January 1st he changes his outlook and contemplates the pleasures of the coming year. Until it was pointed out to him, he was not aware that he was conforming to the ways of nature. A little consideration will show that there is something to be said for this practice, particularly if December 21st is substituted for January 1st. It means a complete break in the routine of the year and is probably conducive to thought.

There is a tendency to vary the amount of exercise with the weather. When this is bad, even healthy men prefer to remain indoors ; they feel better if they do not go out. This disinclination to take exercise seems to depend more on the direction of the winds than on anything else. When the wind is from the south or west, most men desire to go for a stroll. When it is from the east and particularly when it veers round to the north, they do not do so. It is not that they are afraid of the cold : it is that there is no desire.

When it rains they do not go out because they are afraid to get wet. It is not that there is a disinclination for exercise. For at such a time it is noticeable how restless men are, compared with the way they lounge about and seek the fireside when the east winds blow.

Those who provide themselves with a long mackintosh that reaches to the upper part of the boots, and also with a good umbrella, pay little attention to the rain. Getting wet is really of little consequence provided a man keeps on the move and changes the moment he gets in. Trouble comes only if the clothes are not changed and allowed to dry or if he sits about and gets cold. When a soft wind blows from the south and the rain is gentle, walking can be a perfect joy.

Man is often not a good creature to draw conclusions from. His interests are so many. For years I was led astray on

this point by listening to the views of enthusiasts. For instance, many ardent golfers claim that they are all the better for regular exercise and that this should be taken irrespective of the weather. But they are often healthy men of independent means whose only worry is golf. When unable to play this, many have nothing to think about. But in 1932, when there was a long spell of the east wind, most people remained indoors and even the most ardent golfers ceased to play.

When the wind is from the north, birds and animals are quiet and take little exercise ; but when the wind is from the south and it rains, they are most active. Wind is probably the thing that affects birds most of all. Their inactivity on a cold day, with the wind from the north-east, is in contrast to their activity when it comes from the south, even if it brings rain. And this inactivity is seen even if the east wind is of the nature of an anticyclone and is associated with sunny weather, if it is too prolonged. The same applies to other animals. They are indifferent to rain if it is not incessant, provided the wind is from the south or west ; and when the rain appears after a drought, the activity of birds and animals is at once increased.

In countries where the sun is strong it is the custom for men to take a siesta for two hours or more in the middle of the day. It is possibly better to take exercise at one time of day and not at another. For a quietness comes over the countryside about noon and lasts for some hours. This is particularly marked in hot and sultry weather. Fewer birds are to be seen and there is little song. Animals at this time prefer to lie under the hedges. Nature does seem to show that it is better to take exercise in the morning or in the evening when it is not too warm.

Trout are most susceptible to atmospheric conditions, which have considerable influence on their activities. On the River Usk the rise of trout is not seen early in the year. In March and April it occurs in the middle of the day, starting about 2 o'clock and lasting for a couple of hours. In June, however, the rise is in the morning from 10 to 12 and

in the evening from 9 to 10. It is at this time more protracted, beginning and ending less suddenly, and now that the time is longer their movement is more leisurely. It is uncertain what the rise of the trout, which means that they are very active, is due to. It is no doubt dependent upon the hatch of fly, which is supposed to be dependent upon the warmth of the water. Whilst the weather will have some action, anyone who considers the vagaries of the English climate will realise that any theory based upon it to account for the regularity of any phenomena is bound to fail. In all probability it has something to do with the relation of the earth to the sun, which has an influence on the vitality of man. The difference between April and June may depend upon the relation of the sun to the meridian. Man's vitality and temperature are lowest at 3 a.m. and highest at 8 p.m., which is probably dependent upon the relation of the earth to the sun. This possibly accounts for the regular hatch of the fly, though it does not explain the difference between April and June. May not the latter be dependent upon some relation of the sun to the meridian which man is no longer able to appreciate ? The activity of trout varies with the weather. When there is to be a change they remain very quiet for twenty-four hours or so beforehand. On hot sultry days they will not rise until the sun goes down. When they are rising well, this may cease if any mist comes upon the river, and certainly in our southern and western rivers this does not take place when the cold north-easter blows. Those who fish in the eastern rivers, however, tell me that the east wind makes no difference there. The activity of the trout varies with the weather, the time of day, and the time of the year. Before a thunderstorm they will not rise. It is not that they are afraid, because they will rise on a very silent night. They do not mind the thunderstorm itself. It is as if there is something in the atmosphere that makes them quiet.

If the instinct of animals is any guide, it seems that exercise should be varied according to the season and atmospheric and diurnal conditions. The life that men led thirty years ago depended upon rules handed down by past generations. They then conformed more to the ways of nature. For they took all things quietly in winter and in summer rested when

it was warm, and they did not go out when the weather was bad or when it was too sunny. Sunday was taken as a day of rest.

Are we to-day right in making this break with tradition? Whilst the present method of taking so much exercise develops the physique, it may eventually be found to undermine the constitution, particularly when carried out irrespective of the season, the weather, and the time of day. In addition the seventh day is no longer given up to rest. It is true that many remain well when doing this. This also applies to many who break all the rules of health. It has been carried out for less than twenty years, and we cannot yet be certain that it will not affect them later on in life.

It is unfortunate that people to-day take exercise as a routine and are content to be guided by the number of miles they walk. This may serve some disciplinary purpose, but for recreation it is not to be compared with the gentle stroll when the air is quietly breathed and a man goes along chatting quietly to a friend or indulging in the silent comradeship of his dog. Such exercise not only takes a man out into the air, but means a break in his work, and gives an opportunity to observe the changing conditions of nature and to lay by impressions to recall at some later time, and leads to contentment and peace.

CHAPTER XII

BATHING

To come to a conclusion on the value of bathing is by no means simple. For whilst many young people think that the more they bathe the healthier they are, the number of healthy men who seldom bathe and who take only an occasional bath is surprising. I discussed this point with a man of 40, a good athlete who had any amount of vitality. His practice was to take a cold bath occasionally in summer when the weather was very warm, otherwise he took a hot bath once a week. Hot baths, he felt, washed away the natural fats of the skin and predisposed to colds. He bathed when a young man and thought he derived some benefit from it, but he gave it up about the age of 25, as he found it somewhat weakening. And no doubt if a hundred men were chosen at random from the city or country, a history that would be obtained would not be unlike this, except that many would not take the occasional cold bath.

Bathing may act in many ways. It may refresh by cleansing. If the water is cold, it will stimulate ; and if it is warm, it will soothe. But water by itself has some action that cannot be explained in either of these ways. It somehow has a soothing influence upon the nervous system. Once the refreshing effect of the cleanse and the stimulating effect of the cold are over, it is doubtful if water by itself ever increases the nerve energy. Immersion in water considerably increases the metabolism, and so it might be said that bathing invigorates. This may be due to other factors, such as the rub down, exposure to the air, and the temperature of the water. Now few men can remain long in water. They begin to feel languid and there is a great difference between the amount of exercise that can be

undertaken in the water and on land. This is said to be due to the cold rather than to the water, but the languor is even more noticeable if the water is of the temperature of the body. Athletes never take a bath before a race or game, as it causes a feeling of slackness. A warm bath has a certain soothing effect, which is very advantageous if there is any irritability or excitability and if it is possible to go at once to bed. This is seen particularly in those of the hypersthenic constitution. This soothing effect may become lowering, particularly in those of the hyposthenic constitution or those who have been ill.

When the horses came from the colliery the legs and the under surface of the body were covered with mud. It was the custom to throw water to wash it away, but not to give them a general wash down. The ostler believed in water only as a cleansing agent ; if the mud was not washed away the horses did not remain so fit. Otherwise he thought that animals were better if no water touched the skin. He pointed out that horses and hunters were not washed and the less they went out in the rain the better they were. After a good wetting, not only did their coats suffer, but their general condition was not so good ; at such a time coughs and gastric trouble were more common.

It thus seems that bathing soothes rather than stimulates. The loss of strength that comes on with bathing is so immediate and is so quickly recovered from after a little rest that it must be due to some action upon the nervous system. Cold is a stimulant and heat is a sedative. On the other hand, too great cold or too great heat or the prolonged action of either may be depressing. Cold baths in the morning suit some people if they are followed by a glow of the skin and a feeling of well-being. But the hypersthenic already have sufficient energy. The hyposthenic have insufficient, but their constitution may be such that they are unable to react. Or if they can react, the temporary stimulation is followed by a period of depression. Fresh water differs from salt water. Those who are not well

can often take a sea bath without ill-effect, whereas an ordinary bath of the same temperature tends to be lowering. If, however, Epsom salts or eau-de-Cologne are added to the bath, this does not happen. That the salt water has a different action to fresh is shown by the fact that man can swim for a longer distance in the former and remain in for a longer time.

Dr. Crile of Cleveland believes that man is a bipolar mechanism with the positive pole in the brain and the negative in the liver. Not only is the organism driven by electricity, but it was originally created and constructed by electrical forces. Electrical phenomena are always present in living matter. It is possible that when the body is immersed in water some disturbance of the electrical forces takes place. This would account for the difference between ordinary water and sea water or water containing Epsom salts. It is attributed to the density of the water. In all probability it is due to some action upon the nervous system which nowadays we are unable to record.

In 1913, at the end of the holidays, some men were discussing the value of bathing. The consensus of opinion was that it could be easily carried to excess, when it tended to be enervating. They thought it was better not to bathe for a few days after going to the seaside and it was better not to stay in the water for more than twenty minutes. Too much bathing produced a feeling of slackness during the holiday. This continued long after it was over and many did not seem so eager to work on their return. Yet these men were athletes in the prime of life.

Young people can stand baths much better than those on in years and appear to benefit from them, particularly if taken at night. But they have such an abundance of energy that any outlet is an advantage. It comes back to the old thing. On one side of 35 a man has so much energy that anything that lowers it does good ; on the other side, he begins to need all the energy that he can get and anything that lowers it will sooner or later be given up. Hence

whilst young people may bathe frequently with little harm, as they grow older they should bathe less.

Hypersthenic people benefit from a hot bath at night if they go straight to bed. They can take baths during the day without feeling any ill-effect, though they usually limit themselves to one in the evening before dinner. The hyposthenic, on the other hand, may feel some improvement from the stimulation of the cold bath or the sedative effect of the warm bath, but this improvement is temporary and is followed by a period of malaise. On the other hand, the hypersthenic, and not the hyposthenic, is the more liable to catch a chill after a bath if he does not go straightaway to a warm bed.

The reaction to bathing varies with the atmospheric conditions. It is much pleasanter and more tolerable when the wind is from the south than from the north. This is due to something more than a dislike to undressing in the cold, for even indoors where the rooms are warm people do not commonly indulge in a bath when the wind is from the north-east. Bathing also varies with the season, being pleasanter in the summer and spring than in autumn and winter. This is noticeable even when the temperature of the water can be raised.

To sum up: Warm bathing is beneficial by its cleansing and soothing effect. Cold bathing stimulates, and this is increased when the cool air plays upon the skin. By itself bathing does not increase the nerve energy, though this may come from the rubbing down of the skin. The latter is valuable whether a bath has been taken or not. It is a modification of massage, and the value of light massage in all nervous diseases has long been realised. It seems to add to the energy.

CHAPTER XIII

TAKING A HOLIDAY

THE taking of a holiday has always appealed to man. In the Middle Ages the holy-days of the Church occurred frequently. They were devoted partly to religious observances and partly to merriment. With the industrial development of the nineteenth century they became less frequent, and towards its end the bank holidays of Easter, Whitsun, and Christmas were alone retained. But even before the War, the breaking away from work and the taking of a holiday during the year had come to be regarded as essential to health. People endeavoured to get away for a few days at Easter and for a few weeks in the summer, and August had come to be looked upon as the best month. It is only since the War that people have seized upon all opportunities to break away from work on the supposition that this is necessary for health. This must not be confused with a holiday.

The Easter holiday is totally different from that of the summer, for people often travel long distances to be away for a few days. It is a holiday of great activity. The women look forward to dancing. The men often take too much to drink. Are they trying to get rid of the pent-up spirits of winter, or is it a way of heralding in the spring? Is it comparable to the activity of nature that is seen at this time?

The summer holiday is taken more quietly and often at some place near at hand. It is used rather as a means of relaxation and of rest from work. It enables people to overcome any impairment of health due to working under the sultry conditions of summer and to build up the constitution to face the winter. The desire for a holiday at

these two periods of the year may be due to some instinct lying dormant in man.

Is it comparable to the migration of the birds? In early spring the birds return to their old abode and are extremely active. It seems as if they cannot rest and must be on the move. Those that breed farther north make only a short stay; they are here to-day and gone to-morrow. In August the birds begin to collect for the autumn migration. They come together more slowly and not uncommonly spend many days in one place. It is as if they are reserving their strength to face the journey ahead. This need for a change is seen with the birds that remain in this country during the whole year, such as the thrushes and robins. For in the spring and autumn they change their abode, though it may be only for a matter of a few miles.

The summer holiday is undoubtedly of great value. If it is not taken, some men seem unable to do their work so efficiently during the winter and are more liable to minor ailments, such as the common cold. If a serious illness, such as pneumonia, should arise, the prognosis is much worse. If a practitioner misses his summer holiday, he may pass through the winter doing his work fairly well, until the trying days of February or March. Then some trivial illness hangs on for many weeks or develops into something more serious that carries him off in an incredibly short time.

In the colliery an extra horse or two were kept in the summer so as to give the others a rest in the fields. The ostler was certain that a rest of a few weeks in the summer improved their work in the winter. But he was convinced that more valuable than this was the Sunday rest. For it sometimes happened that it was necessary to keep the horses at work on Sundays. If this went on for some weeks, they soon fell off. Although people are obtaining benefit from the facilities that now exist for holidays, in the long run they may be losers since they have abandoned the seventh day as a day of rest.

August and September seem the best months for a holiday, as the rest is obtained so near to the winter. They do not,

however, give the opportunity of seeing nature in her greatest array. For the country is probably most beautiful when the pageant of summer is at its height " between the may and the rose " ; and the sea seems more grand and romantic in June than in any other month. But the early summer days are extremely beautiful in the city and at this time the parks can be a perfect delight. It is in the late summer that the air becomes stagnant and the streets so trying. It is then that a change of air and a rest are most needed. Now the climax of summer is reached on June 21st ; then it is as if nature's work is done. A spirit of quietness begins to come over the countryside and by August the song of the birds is no longer heard. Moulting is already taking place. The leaves of the trees are thick and have lost their buoyancy. Even the flowers in the garden seem weary and exhausted. It is in August, the month of quiet, that a feeling of restlessness comes over man ; he now wants to go away. This must have influenced our parents when they selected it as the time to take the children to the sea.

In recent years my hospital duties necessitated my staying in town in August and in September. There is no time in which I desire more to get away and in which it seems so difficult to settle down. Once the end of September comes this restlessness seems to pass and it is now necessary to make an effort to go away. It is as if by the end of this month one has begun to settle in for the winter. Of course earlier experiences may have an influence, and one is only too anxious to get away in August because so many friends are on holidays. But my impression is that this feeling of restlessness is not due to either of these and is conformable to the change seen in nature.

In former years the whole of August was taken off. It seemed better to do this than to split the holiday into two. That was possible because when one was young it was so easy to adapt oneself to any circumstances. Now it seems that work can be done much better if a week is taken in June and three weeks in September. Even now three

weeks is beginning to seem rather long. It is probably better for people, as they get on in years, to split up their holiday. A patient, aged 70, tells me that for years he has preferred not to take a long holiday, and has split the month he was accustomed to take in the summer into a week in each quarter of the year. He is convinced that he derives more good by doing this.

There are no short cuts to health even with a change of air, and attempts to bring this about so often end in its impairment. A man of 28, who had suffered from ill health during the previous winter, complained to me bitterly of the English climate, for he had taken a fortnight's holiday in September, during the first week of which it rained heavily. Then, as he put it, he had " to bathe like hell " to make up for lost opportunities. This is typical of the attitude of many to-day. This man failed to realise that had the weather been fine the whole time, he might have been worse off. For he was a sick man who, instead of trying by taking things quietly to build up his constitution to face the months that lay ahead, had used his summer holidays just to blow off steam.

CHAPTER XIV

TRAVELLING

NOWADAYS when taking a holiday people dash from one place to another and like to be on the move. May not this constant movement and absence of rest in some way be wearing them out? Of course travelling affects people differently. It comes naturally to some and means no strain, and on holiday they like to go for long runs in their cars. It apparently enables some to relax and others to get rid of pent-up energy. But travelling is a bigger strain upon the nervous system than is often thought, and what may ordinarily be little evident becomes obvious after an illness.

But what to one is a strain is helpful to another as it takes his mind off work. And the rapidly changing scenery of the journey brings peace and contentment to others. The personal factor counts for much. But by the strain of travelling is rather meant that weariness which is apt to ensue if there is much vibration or jolting. In some way these seem to play upon the nervous system.

This was brought home to me at the first battle of Ypres. The convoy to which I was attached took the wounded from the Casualty Clearing Hospitals to the Stationary Hospitals. Their cries on those journeys will live in my memory. In cases of fracture of the femur it was not uncommon to find men, put in looking well, dead when taken out after a journey of a few miles. On the Red Cross trains the cries of the wounded as the train took the points were pitiable. But on a boat, going down from Paris to Rouen, the smoothness of the journey was evident. All the wounded commented upon this.

It is not easy to perceive this strain if the journey is short,

but when it is long it becomes very evident. Reading is still for many the best means of relaxation. Consequently travelling for them is governed by the question whether it is possible to read or work. Neither can be carried on if there is much vibration or jolting.

Travelling on the sea is the most restful of all. The slow 8-knot speed of the tramp steamers is preferable to the fast speed of the liner. For with the slower speed it is possible to be lulled by the motion of the waves and to listen to the music of the sea as they play upon the side. River travelling is restful, but at the end of the day tends to become tiring and weary. There is not that rhythmic motion of the water that is so soothing upon the sea. Long journeys by air can be taken with little fatigue. Though there is the noise of the engines and the jolting due to air pockets to put up with, when travelling say from Berlin to London it is surprising to note how fresh one feels on landing. That tiredness felt after a journey by car or by train is not present. A journey by train or motor car can be very tiring. So much depends upon the track and the number of stops. A well-laid track can be very soothing, particularly if the points are few and far between. But the short rail journey, with numerous halts, is very tiring. Whether a journey by train is to be preferred to one by car will depend upon the distance, the track, and the number of halts. But much will also depend upon the make of car and upon the driver. A Rolls-Royce may render what would be a fatiguing journey quite restful.

CHAPTER XV

SEA TRIPS

A SEA trip is often advised for a man who is a good sailor. It is thought that the air in the middle of the ocean is purer than that at the seaside, and therefore that greater benefit will result. Some go on liners to the Cape, others on tramp steamers. Nowadays most go on pleasure cruises. The good condition of many who return is frequently described, but quite a number come back feeling little if any better. Yet when they settle down at home and return to work, they begin to improve. This is then attributed to the delayed action of the sea. But it must not be forgotten that, when a patient begins to get well after an illness, he rapidly goes ahead, even if he remains at home. This is seen among the poor who are unable to get away.

A sea trip, however, has many drawbacks. Unless a deck cabin is obtained—and this is possible only for the wealthy—the ventilation is poor. The small port-hole is not sufficient, and, if the weather is rough, even this has to be kept closed. Ventilation that depends on a fan is not comparable to that of a wide-open window. Nor are the cabins ideal for sleep and rest ; and when in addition they have sleeping accommodation for two, it may be very trying to one previously accustomed to sleep by himself. The continued hum of the engines and the vibration felt throughout the ship are by no means soothing and may disturb both sleep and rest. The food is good, but the ventilation of the dining-room is not all that is to be desired. If the company into which a man is cast is not suitable, he cannot always get away. A trip on a tramp steamer is the holiday that appeals to some. There is no suggestion of haste, and the quietness of the passage as the boat drifts along gives rise to that feeling

of quiet ease which can be a real joy. The deck is not too far removed from the water, and the play of the waves against the side of the ship and the motion of the sea have for some the same calming effect as great music. Here it is possible to have absolute quiet, to alter the whole routine of living, and to do as one wishes. One can lounge about at ease the whole of the day, and there is not that necessity for being attentive to fellow-passengers as on a liner. The officers of these ships are the best company in the world, and the majority have had that experience of men and of travel which gives them a broad outlook on life. But such a trip will not appeal to many.

Pleasure cruises have become fashionable in recent years. As a means of seeing the world and at the same time taking a holiday, they have many advantages. But some doubt their health-giving properties. On returning many look bronzed and fit, but this robustness is apparent rather than real, for it is surprising how quickly it wears off. It does not seem to last like that which has been acquired at the seaside. Possibly the failure to stay in any one place is, after all, not good. For if, as seems likely, a change of air benefits by some reaction with the constitution, this has less chance to take place if the place is changed every day. Nor has it been proved that the air of mid-ocean is more beneficial than that of the seashore. In my opinion it is less so. There is often to be noticed a difference between the air within a couple of hundred yards of the shore and that several miles out at sea. For at the seashore there is the full advantage of the ebb and flow of the tide, and with it the alternating breezes from the land and from the sea. Possibly the play of the waves upon the shore liberates something to the advantage of man, for on the same day the air of a sandy beach may be different from that of the rocks. This benefit may be lost on a ship a few miles away from land.

CHAPTER XVI

THE ART OF CONVALESCING

CONVALESCING is the term applied to that period when the patient is attempting to regain health and strength after some illness or operation. It must not be confused with the state when a man is run down and can be put right by a few days by the sea ; nor with the feeling of weariness and restlessness seen during a hot summer, which disappears on taking a holiday.

A healthy man can do many things without suffering in any way. Severe mental and physical exertion has no harmful effect ; the fatigue is only temporary and is easily overcome. It is this power of adaptation to any sudden change he may have to face that differentiates him from the convalescent. For with the latter harmful symptoms tend to persist. He is wanting in nerve energy and tires easily. Fatigue and irritability follow slight physical or mental exertion and may not be easily shaken off. There is some impairment of power and a state of weakness persists that is known as asthenia. Things that gave rise to no reaction when he was healthy may now affect him adversely. Slight exercise or even changes in the weather may have some effect. If it is too warm, he feels the heat ; if it is too cold, he catches a chill. On examination few physical signs can be detected apart from undue rapidity of the pulse after slight exertion, and even this may be absent. There is, however, a want of tone—if a word can be used that has great clinical significance but cannot be defined ; and in this respect the convalescent resembles the chronic invalid. Some of this is unavoidable, if the general health has never been good or the disease has been severe. But there is a mistaken impression that recovery from an

operation takes place when the wound is healed, and from a disease when the fever subsides and the symptoms disappear. Every operation is a severe strain. No matter what care is taken, there is bound to be some shock. This is followed by some weakness that may last for many months. After a major operation a patient probably does not regain his former health for at least a year.

After a severe illness, such as influenza or pneumonia, even a longer period may elapse. Weakness is seen to a less extent after all illnesses. For these in some way impair the constitution and recovery takes time. Too little attention has been given to this. For there is a great difference between getting rid of disease and restoration to health. The patient should never be regarded as cured until not merely he looks in good condition, but can deal with troubles and difficulties which he may suddenly be called upon to face. Convalescence starts when the patient has got over the illness and is beginning to get well. Treatment is then directed towards the building up of the constitution. More ill health often results from misdirected effort during this period than from the illness itself. Many patients are pulled through severe illnesses or operations which require great attention and care, and are then left to their own devices and the many ills that body and mind are heir to. By a little attention to a few details much ill health might have been avoided. It is with this aspect of medicine that this chapter deals. No attempt will be made to deal with conditions, such as rheumatism or bronchitis, that are so apt to arise at this time and for which special treatment is required.

Some of the asthenia seen to-day is due to the wish to hasten convalescence. Every patient desires to get over an illness and to resume his ordinary routine as quickly as possible. He wants to get out of bed, as he is under the impression that staying there weakens his system. When he gets up he wants to go home and then to get away for a change, so that he can resume his former activities. Nowa-

days a wound heals more quickly than a few years ago, and, with the more efficient nursing available, patients may not feel the immediate effects of a serious illness as much as they did formerly. Consequently they are apt to resume their ordinary routine too early.

After a major operation the patient should remain in bed for a month and after a severe illness for a fortnight after all symptoms have subsided. Staying in bed is not weakening, for a healthy man can remain in bed for months without any ill-effects. The weakness attributed to it is due to the effect of the disease itself. On going home from the nursing home the patient should go straight to bed for some days. He then gets up and goes out as his strength returns. For the first few days a bed downstairs is an advantage ; it renders unnecessary ascending the stairs, which is at first rather trying. He will then desire a change of air. There is much to be said for this, as in some way it does good. But the strain of the journey, the loss of comfort of the home and all that this means, and the necessity for being attentive to those around him, must also be considered. For though with the present train service and the new motor cars, a long journey can be undertaken with little fatigue, even a few miles may be strain for one who is not well, and things to which ordinarily he is indifferent may now cause much irritation. The tendency is for patients to go away too soon. They are apt to think that convalescence starts from the day they get away and they can resume full exercise. Really they are convalescing from the day that the illness ended, and any attempt to hasten matters often leads to a set-back.

It is not necessary to stay away from work until strength is completely regained. If it is of a kind that can be adapted to the patient's state, it is an advantage to resume it early, though for a few months he should rest whenever he is tired, spend some time in the fresh air, return home early, go to bed early, and get away for the week-ends. In recent years it has been my practice to recommend a longer stay

in bed, a longer stay at home, a shorter period away, and an earlier return to work, provided this is not too strenuous and is well within the patient's capacity. I now advise more rest than I did some years ago and discourage too much exercise. Unfortunately the ideal is rarely possible. For financial reasons too many have to return to work too early. The home may be uncomfortable or the children noisy, and it is essential to get away. When an invalid returns to work, it is only too rare for any consideration to be given to him by either the employer or employees. Consequently, some compromise is often necessary.

After an illness the aim should be to build up and to restore the tone of the nervous system, so that a man may do his work. At the same time every effort must be made to raise the resistance to infection. In addition the constitution should be nursed so as to carry him through the remainder of life. It is fortunate that most patients get sufficiently well to return to work with little effort on their part, though it is often months before they are really their former selves. But some take a long time to regain health, and progress is not always steady ; set-backs are only too frequent. During this time a patient will need all the self-control and discipline he can call to his aid, and he should be given every encouragement. Some of the ill health may be due to his unreasonable attitude. Every effort must be made to reason with him and to put his mind at rest. During convalescence he is always looking forward to being quite fit and arranges his programme accordingly. He should take things quietly until he is quite fit, when he should gradually resume his former way of living. If he adapts his programme to his present state of health and not to what he hopes it is soon to be, he is then more likely to get well. This should be explained to him at the start. It is the man who is constantly yearning for the health he once had who takes the longest to recover.

When health has been regained a man should for many months avoid anything that involves mental or physical

strain. Some try to harden themselves to prevent a relapse. Whether it is possible by exposure to harden oneself to face the rigours of our climate is not certain. Some seem able to do so. In my opinion for everyone whom this course helps, it does harm to many more. It is unwise for the convalescent to attempt anything of the kind. He should nurse his constitution and not try to harden it.

Whether or not treatment should be carried out in an institution will depend on the type of patient. Some are better if they can reside in a place where supervision is exercised, where definite rules are laid down, and some discipline is maintained. But convalescent homes of any standing are rare in this country, and most patients prefer to carry out the treatment for themselves. This is possibly just as well, for where the constitution is concerned, only guidance can be given.

During convalescence the tendency is for health to return. Nature as a rule does her work well, but at times the patient does not react enough. His energy needs to be built up. This particularly applies to the hyposthenic. In other cases the patient may react too much and do himself harm. This particularly applies to the hypersthenic. He is not so much in need of energy as of something to quieten his response. When this takes place his health improves. At such a time attention to small points may make a considerable difference. Some of these will be now considered in this and the following chapters.

The necessity for a suitable state of the soil before instituting therapy was appreciated by physicians in days gone by. Murray has the following : " I refer in the next place to the method of so prescribing and administering our remedies as to make them agree with the patient. The patient's condition may clearly enough indicate the required remedy, but its mode of administration is the difficulty : e.g., the well-known case of anæmic patients who need iron badly and yet cannot take it in the ordinary form without serious detriment. Here comes a great demand on the skill and penetration of the physician. Some will vary

the preparation and its time and method of administration, others will endeavour to prepare the patient for it, and others will seek a more circuitous route by giving that which will stimulate and strengthen the assimilating and blood-forming organs and let them find the iron for themselves in the diet or food of the patient. For instance, we again and again see anæmia disappear under the gentle influence of pepsin and oxalate of cerium before meals, the effect being to soothe and sustain a weak irritable stomach in its digestive efforts."

If this applies in regard to drugs, it also applies to fresh air, sunlight, etc. And during convalescence extreme care is necessary in their application. Given as they are nowadays on the supposition that the bigger the dose and the more quickly it is increased, the better for the patient, they can do much harm.

(*a*) **Acclimatisation.**—It was pointed out in Chapter VII that changes in altitude, latitude, or in the nature of the air, sometimes have an effect upon healthy people. Now it is certain that even slight changes affect the convalescent. Consequently when he goes to a new place he should take things very quietly at first and should spend the first twenty-four hours resting upon the bed or even by going to bed. Certainly they should be spent indoors. The following day a ride in the car may be taken, but exercise should only be gradually resumed.

Most people on going to a new place immediately feel better and are inclined to overdo things such as exercise. At first the convalescent should be governed by rules, for at this stage it is so easy to upset the system by a little excess, and the good accumulated during many weeks of careful living may be undone. The practitioner cannot for a time just be guided by the patient's sense of well-being, for the change of air may banish all feelings of fatigue. It is much safer to do too little than too much. The convalescent is anxious to get well quickly and therefore is liable to overdo things. The same care is essential when treatment by fresh air, sunlight, or bathing is undertaken. For their action

varies according to the altitude, the latitude, and whether undertaken by the sea or inland. Whilst a certain amount may do good, the slightest excess does harm.

(*b*) **Change of Air.**—After an illness a change of air at the right time works like magic. But it is by no means easy to advise a patient about the place in which he should stay, for the constitution may be more damaged than is apparent. If it is thought that he would be better for rest, a relaxing place is advisable ; if he is in need of a stimulus, a bracing place is preferable. Generally it is well to be guided by the air that has suited him in the past. The optimum climate is one that stimulates his powers within the limits of his capacity to respond. But during an illness the constitution has been damaged, and air that previously did good may now have no effect, because of failure to respond. On going to a bracing place he may at once feel better and refuse to take the rest of which he is in need. Therefore the air at first should not be too bracing ; and if in the past a bracing place has been found most suitable, after an illness it is often better to choose one not quite so bracing. This is certainly advisable when convalescence begins, and also for the very old or very young or those who have been very ill. At this time the patient has to feel his way. If no improvement follows a stay of two weeks, a change to some other place may be advisable. Quiet places should be chosen, as it is rest and not excitement that is now needed.

(*c*) **Fresh Air.**—My experience is that those are fittest who remain in the fresh air more in the spring and summer, when the weather is warm, than they do in the autumn and winter, when it is cold. If this is true for healthy people, it is difficult to see how remaining in the fresh air throughout the year will improve the health of those who are not well. My practice is to advise them to go in more for comfort and to keep the windows closed when the weather is cold, particularly when the north-easter blows.

Whilst keeping the air of a room pure and the windows open when the weather is suitable leads to some improve-

ment in health, it does not follow that exposure of the whole body will do the same. It is certainly not advisable during convalescence. For it to do good the constitution has to react and this may not be possible, or even if possible, it may be harmful. For at this time it is warmth and not stimulation that the body generally needs. Cold is more likely to do harm by impairing the nervous system than to do good by hardening the body.

(*d*) **The Sun.**—The convalescent has to be extremely careful how he exposes himself to the sun, for even a little too much does him harm. For the illness has undermined his health, and not until this improves is he able to react. In advertising the various apparatus, manufacturers make astounding claims for sun therapy. Let me stress again that the sun does not act by putting anything into the body, but only by some reaction that it induces. When this does not occur or is possible only to a slight extent, it may do harm. On first going into the fresh air the convalescent should keep to the shade, and only as his health and muscular tone improve should he expose himself to the sun. Over-exposure is particularly harmful in those of hypersthenic constitution, after an acute illness or if there is much wasting.

Dr. Rollier and Sir Henry Gauvain, to whom much of our knowledge of sun therapy is due, have warned us about its abuse. The value of much of their teaching is lost because it is thought that they are speaking only of disease. Really it is applicable to health. In their institutions the head and nape of the neck are always protected when beginning the treatment of tuberculosis. First one foot is exposed for a few minutes and the response is noted. The amount of skin exposed and the time of exposure are then gradually increased, and it is some weeks before the whole of the body is exposed and then only for a short time. Strong adults who pigment easily do best. Red-haired and fair people do not do so well. Great care must be taken with the very young, the very old, and the weak, for they can tolerate only a small amount. Even a little beyond

this does harm. If an overdose is harmful in disease, it is equally so in convalescence, though the ill-effects may not be so apparent.

(*e*) **Exercise.**—Exercise is certainly of value during convalescence. When a certain stage has been reached, those who undertake it in moderate amounts do better than those who stay indoors. But it should be carefully planned and controlled. The convalescent should not become tired. When a healthy man becomes fatigued, this passes off after a few minutes' rest, but in the convalescent fatigue is liable to persist and do harm.

Exercise that tires is probably more harmful than if none has been taken. It should always be followed in the course of a few hours by pleasurable after-effects. Rest should be insisted upon before fatigue becomes evident. If it is possible that too much has been taken, the wisest course is to rest indoors on the following day. A patient is apt to think that by doing this he is weakening himself, but it is not so. Walking downhill should not be undertaken at first, unless there is some conveyance for returning. At this time even a slight elevation of the ground may be very trying and an uphill journey on the return may be too much. The exercise should be only slowly increased, and short walks frequently undertaken are preferable to one long one. It is often necessary to point out to patients that no operation and no illness really make them younger. It is at times surprising to find them undertaking exercise far in excess of that which they carried out when they were well. They pride themselves on doing so many miles a day, but excessive exercise does not improve health. A man may be able to walk six miles because he is healthy. It does not necessarily follow that his health is due to his having walked six miles.

If it is advisable for a healthy man to be careful about exercise, if the wind is unfavourable or if the weather is cold, the convalescent should be doubly so. Either of these adds considerably to the effort and may easily induce fatigue.

There is of course the disciplinary value of regular exercise in all weathers, but this can be over-estimated.[1]

(*f*) **Bathing.**—As the value of bathing to the healthy is somewhat doubtful, it is advisable for convalescents to do as little as possible. If they do bathe, they should stay in for a short time, and sea is preferable to fresh-water bathing. This also applies to ordinary baths, for convalescents are apt to take too many. Those who are not well perspire freely, and often the perspiration has an unpleasant odour. To overcome this they are inclined to bathe frequently. But this increases the tendency to perspire. If they would just wash the armpits, pubis, and feet, any odour would be removed. If the rest of the body be rubbed down with a suitable towel and a glow given to the skin, there will be less tendency to perspire and a feeling of well-being will persist. A hot bath is very soothing to the nerves and may be of value if the patient is irritable or excitable. But it must be remembered that a bath does not increase energy : it rather takes it away.

(*g*) **Massage.**—Light massage to the skin is valuable during convalescence. It improves the sense of well-being and promotes sleep. It seems to add to the nerve energy and has been carried out in neurasthenia for years. It is preferably done by a trained masseuse, but patients can easily be taught to do it themselves.

An ostler drew my attention to the better condition of animals that were groomed. Not only were their coats sleeker, but the tone of the muscles was better and they were more active and energetic. Grooming for animals is comparable to massage for man.

(*h*) **Travelling.**—Long tiring journeys are to be avoided,

[1] When golf is played at the beginning of convalescence, great care is necessary. The walk round an average eighteen-hole course is about 5 miles. To this must be added the excitement and the strain of playing. In addition, if many are on the course, it is not always possible for a man to play at his ease. At this game it is easy for the convalescent to tire himself without being aware that he is doing so. As a control, he should walk a similar distance once a week to see if it leads to fatigue.

particularly in the early stages. The sending of patients abroad soon after an illness is a big strain. It is doubtful if any air is sufficiently valuable to justify this. At times a relapse is produced, and at others the recovery is prevented.

(*j*) **Sea Trips.**—The value of a sea cruise for the healthy is not disputed. But for those who have recently been ill it is harmful, for there is often too much excitement. The constant change of air is not advisable, for the constitution has been damaged by the illness, and it takes much longer than usual for it to become adapted to a new air. It is a disadvantage for this to be changed each day. Consequently it is wrong to send convalescents, and particularly those who are young, upon a sea trip, for they need rest and not excitement and change. They should not be placed in circumstances where the temptation to rather hectic living is so great. The many social engagements and the necessity for being introduced to people and of having to be pleasant may be a big strain on those who are not well. With the best intention their fellow-passengers will endeavour to give them a good time. Consequently whilst a visit to the sea-side is generally beneficial, a sea trip should rarely be advised and only after much consideration.

(*k*) **Recreation.**—A convalescent is in need of fresh air and rest. There has been a tendency in past years to concentrate on these, and to forget that relaxation and excitement are also needed. As a result, treatment becomes irksome and depressing and some are apt to break out and indulge in dissipation. It is better to realise that nowadays a certain amount of amusement seems essential. It is the only way some people are able to relax and to rest. So long as it is controlled, it may even be beneficial. Whereas that which is taken on the sly may be harmful, because it is taken to excess. For instance, some patients obtain relaxation and rest by going to cinemas, others by going on motor trips. These are not harmful unless they are carried to excess. It is better to forbid such things only when there is some definite contra-indication.

CHAPTER XVII

WARMTH

PEOPLE who are unwell feel both the cold and the heat. In a hot room or when the weather is warm their skins perspire freely, though not with that oily perspiration characteristic of health, but with a very watery perspiration often of unpleasant odour. This is due to impairment of the function of the skin. To overcome this, some put on extra clothing, others try to harden themselves by taking cold baths, wearing thin underclothing, etc. Whether this is wise or not for a healthy man is uncertain. It is extremely unwise for a man who is ill or who has recently been so. For though it may benefit a few, the chances are that to the majority it does harm. Cold is the enemy of the nerves, and already the nervous system of these people is below par. On the other hand, a very hot room tends to be depressing and too much clothing acts in the same way. Woollen underclothing should be worn next to the skin to absorb the perspiration. Even in cold weather it is unnecessary to wear thick woollen underclothing, for two thin vests are warmer than a thick one and a woollen vest covered with a silk one is the warmest of all. The latter is the one thing that seems able to keep out the cold winds. The old-fashioned cholera belt, worn day and night, is valuable, particularly when there is any gastro-intestinal trouble. A flannel back to the waistcoat is of value, especially if the patient is inclined to lumbago. Some seem to think that once a muffler or a flannel waistcoat has been worn it must be continued until the weather becomes warm. This is not so. They can be given up, provided they are available immediately the patient feels the cold.

For those who are not well the bedroom should be warm when it is entered and should be cooled only after getting into bed. A gas or an electric stove is invaluable to take the chill off the room on getting up in the morning or on going to bed. For those who live in the country an oil stove may take its place. The danger of the cold room to the patient is not when he is warmly clad, but when he is taking his clothes off. Yet he is in the former state in the warm room downstairs and in the latter in the cold bedroom. The necessity for warmth in the bedroom when a man is not well cannot be stressed too much. Its neglect is the cause of many colds and of much persistent ill health. The dangerous time is just as the clothes are removed. Some seem to think that warmth makes them soft and increases the liability to the common cold. Nothing could be more fallacious. Warmth makes people comfortable and so makes them contented and promotes that sense of well-being which is conducive to health. The bed should be warmed with a water-bottle placed in the region of the pelvis as well as at the foot, though it is not necessary to retain these after the patient has got in. Cotton sheets are better than the best linen ones. In many country districts it is the practice, particularly as people get on in years, to sleep between blankets. Many who are unwell find greater comfort from this, particularly if they perspire at night. The wisdom of sleeping between sheets at night when the vitality is low is questionable. The majority of blankets are, however, too coarse and unpleasant ; but flannelette blankets corresponding in texture to the best underclothing, which can be washed, are available. They seem to add to the comfort and to the depth of sleep. They are to be recommended for those who are not well and for the hyposthenics.[1]

With the 4th South Wales Borderers in Gallipoli it was noticeable that, so long as the men could keep warm, their

[1] Those predisposed to neuritis, rheumatism, etc., derive much comfort from these blankets.

health remained good and their spirits high. Even when they were wet through, nothing happened so long as they were warmly clad when they lay down and slept. When they were not properly clothed, getting wet immediately played havoc. I was commenting on this to a man who had served in many campaigns and who had travelled far. He informed me that since he was a young man he had always slept between blankets. He was convinced that it was much safer for those who were in any way exposed to the damp. This probably explains the old belief that, if there was any doubt about the sheets being aired, it was much safer to sleep between the blankets.

The application of oil to the body is of great help in cold weather. When the storm of November 1915 had depleted the already thin ranks of the British troops in Gallipoli, whale oil was used to massage the feet to ward off frost-bite. Some of the older men used to rub this into their bodies on the advice of a traveller in the ranks. What was at first regarded as a dirty procedure, became universal. It certainly added to the sense of well-being by keeping the body warm, and after it was started there was less sickness among the troops. In Flanders in October 1914 it was surprising to note how the Sikhs took off their clothes in the evening to rub down the body and did not seem to feel the cold (it was the moist cold that followed in November which did them so much harm), whereas the British troops went about well clad in their British warms. The indifference of the Sikhs to the cold was possibly due to their anointing their skins with oil.

Since that time I have advised those who are unwell, particularly if they feel the cold, to rub down the body each morning with some oil. The best of all for an invalid is a cod-liver oil skin cream made by Thomson of Elgin ; the odour is not unpleasant, though it is inclined to stain the clothes. An elegant preparation is the baume tranquille of Roberts & Co. of New Bond Street, and l'huile antique of Berry & Co. of Torquay. There is no question that these are extremely valuable if applied when the cold winds

blow. They also do good to elderly people whose skin tends to become dry, for a little oil undoubtedly adds to their comfort. Some prefer to add an equal part of eau-de-Cologne, for, though these are not miscible, if the bottle is well shaken a good mixture is obtained.

CHAPTER XVIII

FOOD

THE question of the diet is of much importance, but I can here only outline certain principles. In health a man can eat any food he may desire. It is almost impossible for him to make himself ill by taking or abstaining from food. When he is ill he may diet himself most rigidly, but it is difficult for him to get well. Not only is the food not absorbed, but what is absorbed into the blood does not seem to be able to reach the cells. For this at present no remedy is forthcoming.

When recovering from an illness a man needs much food, as the body has now to be built up, and within reason the more he is able to take the better he is. But the desire for food is less and the power to digest it is limited. Big meals at long intervals such as the healthy take are unsuitable, for the muscle of the stomach, like that of the rest of the body, is wasted and weakened. What is needed is easily digested food, in small amounts at short intervals, so that the stomach is not over-burdened. It is true that little rest is given to the stomach, but this seems the lesser evil. A man who is not well feels and does better on small meals at short intervals than on bigger meals at longer intervals.

Whilst he must be encouraged in every way, it is useless to force food upon him, as this may do harm by producing nausea. The appetite of the convalescent is often capricious and there is not the same desire for food nor the feeling of satisfaction after it is taken. The appetite needs to be stimulated, and therefore the food should be well flavoured. A common feature of invalid foods and light diet is their tastelessness. It is quite unnecessary to make them as tasteless as possible.

It is important not only that the food should be digestible, but that it should be well digested. It should be well masticated and plenty of time should be taken. The bolting of food has become a national failing, and is apt to be persisted in after an illness. The discomfort produced may be very trying and is responsible for the loss of appetite. This particularly applies to milky foods, which require little mastication. They are soft and the tendency is to take them quickly. The only way to be certain that this is not done is to eat by the clock. At least twenty minutes should be spent over each meal. Even when drinking a glass of milk, this amount of time should be allowed. It is because milk is taken so quickly that it often causes indigestion.

The change from one diet to another is often carried out too quickly. In hospital a patient is put from a light diet to a fish diet and from this to a full diet. Here the economical aspect must be considered. Whenever possible it is better to proceed gradually and to add the new diet as a separate course, beginning with one mouthful and slowly working upwards. The stomach of the convalescent is, like all the organs, below par. Though it is often intolerant to anything new, very few foods are absolutely poisonous. It can adapt itself to most foods if the change is made gradually and the patient is willing to put up with a little discomfort for a short time. This gradual change will upset him very little. Unfortunately, patients often refuse to persevere. A little discomfort makes them certain that a food is indigestible and they give it up for the rest of life. It is not necessary to make the diet too strict. The course marked out for an invalid is often more severe than that which many people undergo in Lent. As a result it becomes intolerable and the will becomes undermined. When certain foods are forbidden, it generally does not mean that they should be completely given up, but only that they must be taken in moderation. It is not possible to lay down definite rules about diet, for just as the constitution of people varies, so

does the diet they require. Only guidance can be given. The patient has to find out for himself what foods disagree. For not only does the amount of food advisable vary with the passing of the years, but a food that is almost a poison at one period of life can be taken with impunity later. This applies less often to protein foods than to carbohydrates and fats.

A medical man who was operated upon for gall-stones at the age of 43 tells me that before the operation he could eat as much Devonshire cream as he could obtain, but dared not touch butter. He now finds that he can tolerate large quantities of butter, but a little Devonshire cream upsets him. It is difficult to account for this, as both are made from milk. He is much interested in those who have had operations for gall-stones and finds that although there is certainly one fat that disagrees with each, it is rare to find a series of patients who have to avoid the same fat. It is therefore obvious to him how impossible it is to be definite on the question of diet.

It is important to keep this in mind in the present endeavour to make dietetics a science. In many hospitals special departments are being set up for their study and for advising patients. Their work is based upon the nature of the illness, the weight, the height, and the calorific value of the diet. The constitution of the patient receives little consideration. It will be found that where the nervous system is very active (and activity must be distinguished from ability), more food is required. As it is impossible to estimate the amount of this activity, it is unfortunate that advice upon the diet rests with those who can know nothing of the constitution. Whilst standard diets can be laid down for the treatment of diseased states, each patient has to find out for himself what is really advisable. However, the moral and disciplinary value of a diet to the invalid must not be ignored.

When a food is found to disagree the proteins should receive much consideration. Though a certain amount of

protein is essential for most people, it is needed in large amounts only in wasting diseases, such as tuberculosis, when much exercise is taken, or when the weather is cold. It is surprising how well many people keep when the amount taken is very small, and it does seem that during convalescence excessive protein is not well tolerated, nor is it necessary. At such times carbohydrates and fats are more needed and animal foods may for a time be given up altogether. In an acute infection the patient is better if he takes plenty of fluids, cuts down the fats and proteins and keeps as much as possible to carbohydrates. In a chronic infection he does better if the carbohydrates are cut down and the fats increased. This is the basis of the ketogenic diet. The foods that suit the convalescent best are often those that were tolerated in childhood. In general, the hypersthenic seem to be benefited by taking much carbohydrate ; the hyposthenic, by taking much fat. Milk is a good food if taken slowly. But for some it is unpalatable and seems to aggravate any gastro-intestinal disorder present. Dried milk, sweetened with glucose, is very palatable and is more digestible for many than milk. It is as suitable for the invalid as for the young. Some patent food will be found to agree, and sooner or later each patient finds the one most suitable for him. But repeated trials may be necessary.

Chronic invalids are inclined to drink large quantities of bland fluids. Whilst this may do little harm for a few days, its wisdom for prolonged periods is doubtful. A man in good health may drink little or much without suffering any ill effect, and there is no question that the majority of people would be benefited by drinking more. But large quantities of fluid taken over a long period seem to be lowering. It is found that under the ketogenic diet patients with chronic infections do better if less fluid is taken. It is possible that hypersthenics are better for taking plenty of fluids ; hyposthenics, for taking little fluids. It is probable that the waters of many spas have some phylactic action upon the nervous system, protecting it from the

action of toxins and at times liberating those already fixed. Whilst they may have this action when taken at the spa, it is doubtful if they have any when bottled for some time. Caffeine is injurious to the convalescent, and tea and coffee are better avoided. They should certainly not be taken in large quantities. Unfortunately it is difficult to replace them, as most of the substitutes are very insipid. A cup of coffee at 11 a.m. is least harmful. Alcohol is better avoided, as it has some harmful effect when a man is unwell. It is often found that men with refined tastes who have at one time been partial to their glass are inclined to give it up at such a time. Whatever views the practitioner may have about alcohol when a man is well, he should in no circumstances prescribe it to one who is convalescing from an illness, if he is not accustomed to take it. For after an illness some weakness of the will may be present and may persist for a long time. The dangers of prescribing alcohol are then great. The sense of well-being that comes from a matured wine or whisky probably is not due entirely to the alcohol itself, but to the volatile oils and esters produced in maturation. Where matured wines and spirits can be obtained they do good, but the whisky and the beer and many of the wines now on the market have none of the value of the old matured drinks and do harm. Consequently many have ceased to prescribe them.

In recent years much attention has been given to the vitamins. With the convalescent attention need be paid only to two, the vitamins A and B. Vitamin A seems to increase the resistance to infections ; vitamin B has some action upon the nervous system. The best form for giving vitamin A is cod-liver oil. Unfortunately many of the preparations on the market are valueless. Either they are too old or the vitamin has been destroyed in the process of refinement. Many of the preparations of malt and oil contain too little oil to have any value. The pure oil is the best for those who can take it. Thomson of Elgin makes an extremely palatable emulsion. Cod-liver oil is not only of value for

children, but for elderly people. I have often noticed that when a patient's condition hangs fire after an operation, cod-liver oil may soon put him right. Too big a dose should be avoided. One teaspoonful three times a day seems to be sufficient. The best means of taking vitamin B is by means of marmite or of yeast. Half a teaspoonful of British yeast rubbed together with sugar makes an emulsion that is most palatable. I have little faith in the manufactured preparations of the vitamins now on the market. They seem to do little good when the ill health becomes chronic.

CHAPTER XIX

REST AND SLEEP

MR. WINSTON CHURCHILL in *My Early Life* has the following passage (page 95) :

"I have no doubt that the Romans planned the time-table for their days far better than we do. They rose before the sun at all seasons. Except in war time we never see the dawn. Sometimes we see the sunset. The message of the sunset is sadness ; the message of the dawn is hope. The rest and spell of sleep in the middle of the day refresh the human frame far more than a long night. We were not made by Nature to work, or even to play, from eight o'clock in the morning till midnight. We throw a strain upon our systems which is unfair and improvident. For every purpose of business or pleasure, mental or physical, we ought to break our days and our marches into two. When I was at the Admiralty in the War, I found I could add nearly two hours to my working effort by going to bed an hour after luncheon."

Whatever people may think of Mr. Churchill's political views, none will question his amazing vitality. If such a healthy man has found this rest in the middle of the day so advisable and derived so much benefit from it, how much more valuable will it not be to one who is not well ?

When a man starts work after an illness he feels tired at the end of the day. A longer period of rest is advised. Instead of going to bed at 11 o'clock, he now goes at 10 and gets up half an hour later. Even then he is still weary and tired, but never attempts to break up his work during the day.

A convalescent should rest for one hour after lunch, half an hour at 6 o'clock, and a quarter of an hour at 9 o'clock. Even if he does not sleep, this is restful to the brain.

When the advisability of rest is pointed out, a patient is reluctant to undertake it ; he says that even if he lies down he cannot sleep, and if he could this would only interfere with his sleep at night. But at this stage relaxation is just as important as sleep, and mere weariness does not improve the latter. If anything, it detracts from it. When a man is tired he feels the need for sleep. If he is too weary, this may elude him ; and when it comes it is liable to be disturbed by dreams. Hence, these intervals of rest do not prevent sleep, they seem to improve it. There is, however, no longer the necessity for so much ; for by splitting up the day it is possible to work an hour longer in the evening and to rise an hour earlier in the morning.

Like everything else, rest has to be cultivated ; and to be able to lie down and to relax does not come easily to everyone. The man who has lived an active life often finds this very difficult at first. He is anxious to get back to his work. When it is brought home to him that once resting is acquired as a habit, his work can be done much more efficiently, he usually appreciates its value and is content to give up an hour to rest. Relaxation then comes in time. But if rest is taken as a bore or duty, it has much less value. He who does best when not well is the man who realises that now he must not work so much and be content to take things quietly for a time. The contented spirit is essential to proper relaxation and is an asset at this time.

Rest in the arm-chair in front of the fire is good, but better still is that on the old-fashioned couch, which used to be placed in some comfortable part of the room. A few who can become indifferent to the talk or the movement of others are able to obtain complete relaxation in this way. But most people find it necessary to get right away from everyone. The best rest is obtained by going into a bedroom, taking off the boots and coat, putting on a dressing-gown, and lying full length on the bed. It is all the better if the room can be warmed. It is essential that there should be no reading or talking. If sleep is not possible, the eyes should be closed

and the limbs allowed to lie as loose as possible. The thoughts should be kept off work and the habit should be cultivated of letting them linger upon the pleasant things of life.

Sleep.—Few people give any consideration to sleep when well. It comes so naturally that they scarcely realise what it means. They look forward to the pleasure of a meal or to some form of exercise or to a holiday ; but few look forward to the pleasure of a sleep or recall their good nights. They think only of the bad ones. Were sleep to be wooed and the nights when she was so quiet and so deep dwelt on, she would be found not so fickle as she is sometimes regarded.

In the evening as the hour for retiring approaches, a man's thoughts are generally of the book he is reading or of the work he has in hand. Rarely does he give any thought to the sleep he wishes or to the dreams he would like to have. Were he to think of himself sleeping deeply and quietly, some improvement would take place. But not immediately, for improvement may take many months, and may be so gradual as to be hardly perceptible. But once it comes and the beauty of natural and deep sleep is again appreciated, the time that has been given to wooing it will never be regarded as wasted.

An innkeeper who had suffered from insomnia first drew my attention to the importance of preparing oneself for sleep. He had studied medicine, of which he had a good practical knowledge. No matter how busy he was, and how much work he had to do, he never allowed an evening to pass without giving some thought to the sleep he desired during the coming night. He looked back upon the nights when sleep came so readily and remained so deep, and never allowed the bad nights to linger in his thoughts nor did he talk about them. For a few minutes before getting into bed he thought of himself as sleeping deeply. As he lay down and as he put his hands under his head, not only did he relax and breathe deeply, but he had cultivated the habit of letting himself go as if he were passing through

the bed and leaving the room and wandering into the realms of eternity. The important thing is just quietly to ponder over what one wishes one's rest to be as one closes the eyes.

The conversation in the evening and the thoughts to which it gives rise are bound to have an influence on the nature of the sleep. Before retiring all conversation should be carried on quietly and nothing should be permitted which is likely to disturb the mind. In many families it was the custom to have supper at 8 o'clock, after which reading was encouraged and the conversation was subdued. Nothing controversial was allowed. The talk should always be about the pleasant things of life. The book should be one easily comprehended, and requiring little or no concentration, as this tends to stimulate the brain.

The things that the mind lingers on before retiring are bound to influence considerably the type of sleep. It is possible to cultivate the atmosphere that is desired, though its development will take time. It is well to get into the habit of recalling something of beauty that has crossed one's path during the year. "The hours when the mind is absorbed by beauty are the only hours when we really live." When sleep is slow in coming, some sleepy lullaby of childhood might be recalled. For those who love nature the crooning of the turtle dove or the cooing of the pigeon can take its place.

It is unfortunate that broadcasting is not used to better purpose. Nowadays it is rare to hear anything except dance music during that last half an hour before turning in. How valuable it might be was brought home to me a few years back. On three consecutive Sunday nights the last item was "An Epitaph" by Walter de la Mare, "The Lake Isle of Innisfree" recited by someone with a most beautiful voice, and Chopin's seventh prelude in A major on the piano. They were not part of the set programme, but seemed to arise as an afterthought in the mind of the performer. It seemed so strange to hear them coming so quietly out of the ether and

then so quietly going away. Thus was evident how a great poem can always bring some new thought to a mind prepared to receive it and how great music can recall some old emotion. This is most likely to happen when the brain is a little weary and is looking forward to rest. To have this influence it should be a thing of beauty and something that is already known or the meaning of which can be easily grasped by a tired brain. For at this time of night most people have difficulty in concentrating upon anything new, and the necessity for doing this detracts in some way from the soothing influence of a great thought.

Many people take the last meal not later than 8 o'clock, which means that, though the stomach is empty when retiring, no food is being absorbed during the early hours of the morning when the vitality is so low. Yet most animals prefer to eat just before falling asleep. Now in some people food taken just before retiring draws blood away from the brain and improves the sleep. This particularly applies to the hypersthenic, for he feels better and sleeps better when the stomach is full. On the other hand, food in the stomach of the hyposthenic is apt to lead to some abdominal discomfort which disturbs the sleep. He feels better if the stomach is empty. But to go from the evening meal to the morning is a long time for a healthy man ; and this particularly applies to the hyposthenic, who is not able to store food well. The general condition of many is certainly better if something is taken the last thing at night. The problem is : For this patient may not the disadvantage of a little abdominal discomfort be more than counterbalanced by taking some food which will be absorbed during sleep ? Most people are better for taking something light the last thing at night, but consideration must be given to each patient. Here again it is not possible to lay down a rule for all.

A glass of cold milk and some biscuits help the hypersthenic ; a cup of dried milk with glucose given warm or some patent food helps the hyposthenic. But what is chosen

for each patient is that which he finds he can digest without discomfort. For those who wake up at 3 o'clock and who are unable to sleep afterwards some dried milk and glucose or even glucose alone, kept warm in a thermos flask by the side of the bed, is very sustaining. It seems to improve the subsequent sleep, and even if sleep does not come its loss does not seem to be so fatiguing. In a bracing place more, and in a relaxing place less, food will be needed.

For the last hour or so some prefer a subdued light. For these a candle is best, though an oil lamp is excellent, for the light is soft and mellow. Reading becomes less trying and, when the eyes are first closed, there is not that burning in the brain which is at times so trying. If electric light is used in the bedrooms, a green or blue shade is restful to the eyes. An alternative is to wear glasses with Crookes A or smoked lenses.

The bedroom should be warm when entered. If it is a little colder than the lounge, this may raise the blood pressure just sufficient to improve the circulation in the brain, which may keep away sleep. Bedrooms should be comfortable and should have thick curtains to the windows and comfortable carpets and rugs upon the floors. It is difficult to understand why the wall-paper and the curtains of a bedroom are of a light colour. This may suit those who sleep deeply and need some stimulus to rouse them in the morning. But for those who sleep lightly it is better to have dark wall-paper and thick curtains. These absorb the rays of light and create that quiet atmosphere so conducive to sleep and to the contented mind. Some sleep better with a little light in the room. For these the old-fashioned night-light is useful and is preferable to the subdued electric light now available. Some sleep better with the windows open, others with the windows shut ; and others, with something over the face. It is said that this is unhealthy. But deep sleep is so beneficial that for the average person anything that promotes it is good. So important does it appear to me that I am extremely reluctant to alter anything the

patient does, if there is any chance of the sleep being disturbed.

Some sleep better in a quiet room ; others, if there is some noise outside. Where the sleep is disturbed by dreams, or when the patient has noises in the head, it is better if the surroundings are not too quiet. The passage of a train or the cars in the street now leads to a sounder sleep. If the bed faces the south, the sleep seems deeper. Small changes such as this often make a great difference to one who is not well.

Massage has a soothing effect upon the nervous system. But deep massage is not indicated, only a gentle stroking of the skin. Its value in diseases of the nervous system is established, and it seems to soothe as well as to tone up the system. It is best done by one who is skilled, but many can be taught to do it for themselves. No energy should be used, as this sends up the blood pressure and, by stirring up the circulation in the brain, prevents sleep. A warm foot bath and even a hot bath may be invaluable, particularly if the patient is excited or irritable.

The hypersthenic sleeps well early in life. It is when his blood pressure rises that it begins to fail. The hyposthenic sleeps less well early in life, though this tends to improve as the years go by. The hypersthenic sleeps better after a hot bath, the hyposthenic after gentle massage.

Once sleep has been disturbed by a bad dream it is useless trying to fall off straightaway, for any that followed would be likely to be disturbed. It is better to wake up thoroughly and to read some passage of prose or poetry for half an hour or so. It is probably better now to read something that needs concentration, the whole object being to direct the mind into some new line of thought. It is only when it is composed that the eyes should again be closed.

The loss of one night's sleep never does any harm. It is, of course, trying, but by itself does not undermine the health. So much depends upon the attitude of the patient. It is only if he worries that it will impair the health. If the sleep

has been poor, lying down and closing the eyes for ten minutes after breakfast makes a big difference. During the day the sun should be avoided, little exercise should be undertaken, and there should be frequent periods of rest. Even closing the eyes for a few minutes is a considerable help.

Sedatives should be taken only under medical supervision. There is little harm in them if they are properly given. The practitioner should never give the patient the prescription, nor is it advisable to discuss this line of treatment with him. I have spoken to several practitioners who had been compelled at one time or other to take hypnotics. These were prescribed for them by other practitioners. They were not told what they were being given, nor did they wish to know.

CHAPTER XX

THE CULTIVATION OF THE MIND

THOSE who are ill know full well that their physical strength is impaired, and they expect this to return only by making some effort to develop the muscles. They have first to get out of bed and take a little exercise which must be only gradually increased. Otherwise, complete physical power would not return. As at first some feeling of weakness or tiredness follows, the effort has to be constantly renewed. It is only as progress is made that the weakness is overcome. Consequently, at first exercise must not be too active or too prolonged. Few seem to realise that there has also been some deterioration of mental power, for every illness impairs the function of the nervous system. The will, the imagination, the memory, and the special senses are affected. Things that could be done easily before may now need a sustained effort.

Unless an attempt is made to train the mental powers as the health improves, there is no reason why they should recover completely. This particularly applies to those over 35, who cannot adapt themselves to changed conditions so quickly as the young. It is true that many do get quite well without any effort on their part, but this is largely because nature works so well. But when the illness tends to become chronic or convalescence is prolonged, this is not likely to occur. And much ill health and much impairment of mental power that follow are due to failure to realise that some training of a sick mind is essential if it is to be restored. Though practitioners now advise rest where previously they advised physical exercise, they are inclined to recommend some mental exercise when the patient desires to rest, provided he is not ill. Mental exercise must be used even more

cautiously than physical. Attention should be paid to the control and direction of the imagination, to the training of the senses, to the improvement of the memory, and to increasing the powers of concentration. Now concentration is the key-note to every mental exercise, and is governed by the activity and length of time for which it is performed. But every effort should be easily within the capacity of the brain to perform and be only gradually increased. It should not be followed by a headache or undue fatigue. At first exercises should be short and moderate. As health improves, they should be increased. Now and again the eyes should be closed and the body allowed to relax for five minutes or so. Short periods of active concentration with long intervals of rest are more beneficial than desultory reading over a longer period.

When it comes to the training of the mind, few patients know how to proceed. They look to the practitioner for guidance. But they must rely on themselves, as so much depends on their education and outlook on life. All that the practitioner should be expected to do is to indicate the time when mental exercise should first be taken and to see that the patient does not tire himself.

So many people have no plan of life. They just drift along and do the work that falls to their lot, carrying out certain social obligations and taking whatever pleasure comes along. No exercise for the training of the mind has formed part of their daily routine since they left school, and immediately they have to give up some of their former activities they become lost. They do not know what to do with their spare time and tend to brood and to become morose. After an illness a man is suddenly confronted with much spare time when all his mental faculties are impaired. To preserve even the former habits requires some effort ; to develop new ones needs much tenacity of purpose and a sustained effort of the will. What is easy when a man is well, may be exceedingly difficult after an illness, as this may suddenly add, temporarily it is true, ten years to his age.

On the other hand, an illness often gives an opportunity to a man to reorganise his whole life. It is unwise for him at this time to go on just anticipating getting well and planning the work to be done when this takes place. For convalescing takes much longer than is commonly thought, and the work should be adapted to the power at the moment. Even if an illness is prolonged, a man can do much useful work if he will but draw up a plan to organise his life. Only by keeping the imagination active and directed into the right channels and by keeping the senses trained and on the alert is it possible for him to regain his old activities.

The philosophy of living is too big a subject to discuss here, as when the twenty-four hours are divided up the following must be taken into account :

1. Work.
2. Play, under which is included exercise.
3. Social obligations to others and to the institutions erected for their welfare.
4. Moral obligations to religion, to the city, and to the state.
5. Self-culture, meaning that form of education which manifests itself in refinement of mind, morals, and taste.
6. Recreation, meaning those things that refresh and restore and bring peace and contentment.
7. Rest and sleep.

During an illness a man has to fall back upon his religion, his self-culture, and his recreation. Then will come in useful the habits he has created when he was well. It would be inadvisable, as well as impossible, for any medical man to advise patients upon such matters. For in culture, as well as sport, it is the thing that appeals to the individual that counts. The practitioner should never quarrel with any man's recreation or even comment on it, if it brings peace and contentment. Only if it is unhealthy or is too severe a strain should it be forbidden. An illness is a big strain on a patient and reveals many weaknesses. To expect many to re-educate themselves is to look for the

impossible, so practitioners refrain from giving advice on this subject unless it is specially sought. It might be resented as a piece of impertinence.

When a patient is found to be reading books on psychology and psycho-analysis, it means that he realises that his mind is sick and is anxious to improve it. I have seen few books on this subject that could be of any value to a sick man. Abstract principles are discussed, but no rules that a patient can follow are given. The terms used are strange and confusing. In the attempt to establish a science of the mind, information about the art of living is neglected. Few patients can obtain advice from them. At such a time they should read that great essay on Recreation by Viscount Grey of Fallodon, which gives in such simple language the best method of organising leisure time, and would show many how to reorganise their lives.

It is unfortunate that our present system of education encourages the accumulation of facts rather than the cultivation of atmosphere. This even applies to students of nature and those who in later years devote time to the cultivation of the mind. In this way the people of to-day differ much from those of the 1850 type, who were so susceptible to atmosphere and who had such a great sense and love of beauty. This is the outlook that leads to peace and contentment, when a man is sick.

The Americans have a word, "naturist," by which is meant one who loves nature, not because of a desire to kill or classify, but because of the enjoyment that he receives. He is far different from the hunter, the sportsman, and the scientific naturalist. The men of the 1850 type were essentially naturists. They knew nothing of birds beyond regarding them as songsters, robins and sparrows. But they appreciated the beauty of their songs and in their walks would stop to listen. If they stopped in a field to admire the flowers, it was not to draw attention to some rare species, but to observe something of beauty that was pleasing to the eye.

They had the faculty of comparing the happenings of life with something that occurred in past years. It was not so much with what someone else said, as what they themselves had experienced, for with them no year had been lived in vain. During an illness those are happiest who can still recall some of the beauties of life and some of the great thoughts of mankind. Elderly people when very ill go back to the scenes of their childhood and recall passages from the Bible which have some bearing on the life they have lived. It must be a great comfort to one who is ill, with his senses so numbed that he ceases to live in the present, to be able to return so easily into the past. To-day young people and even many of the middle-aged seem to have nothing to fall back upon during an illness. They go on quite well so long as their faculties are active and they are being visited by friends. When they are too ill for this and cannot read or accumulate facts, they cease to take any interest in life. No practitioner can put this right. This is a matter of education and of the way they have been accustomed to think. The spirit of restlessness that is abroad to-day may be little noticeable so long as a man remains well. It becomes extremely trying to himself, as well as to others, when he is ill. But if he will realise that the fault rests with himself, it can always be remedied if he will but try. In this he should receive every encouragement from the practitioner.

CHAPTER XXI

THE ASTHENIC STATE AND ITS TREATMENT

THE practitioner not infrequently comes across cases in which there is an absence of well-being, nervous instability, and some disorder of function in one or more organs. This condition may have been present throughout life or may be traced to some remote or recent illness. It is seen to some extent after every severe illness or operation, when it is usually transitory. It is most likely to follow influenza, mental fatigue, or a fright. When it persists very long or is unduly severe and no known disease can be detected, a state of asthenia is said to be present. It was referred to by Sir James Mackenzie as "the *x* disease." The characteristic features are a feeling of weakness and fatigue that come on after any mental or physical exertion. Associated with these are vague pains about the body, especially in the abdomen. All the mucous membranes are pale and flabby and have a tendency to secrete mucus. They are liable to develop a low-grade type of inflammation difficult to cure by ordinary medicinal means, though it tends to disappear in the spring and summer.

There is a want of tone and a loss of power in all the voluntary and involuntary muscles. They feel flabby and are often wasted. They are not able to make very active and sustained efforts. As a result disordered function is general, though where this is most marked will vary with the individual.

It is unlikely that even in a healthy man all the organs have the same reserve power. It is probable that there is some slight failing in a particular one, and when there is any failure of health this is most likely to feel the effect the

greatest and consequently to give rise to symptoms. This is seen right through life.

Though in asthenia the loss of tone is general and there is impaired function in all the organs, it is probably more marked in one, and of this the patient usually complains. In one person the trouble may be in the eye ; the ciliary muscle has difficulty in focusing and objects tend to be blurred. In another it is in the heart, producing that strange condition known as disordered action of the heart (D.A.H.). In another it is in the gastro-intestinal tract, giving rise to atonic dyspepsia, constipation, diarrhœa, and the chronic infections. In another it is in the genito-urinary tract, giving rise to disorders of micturition, leucorrhœa, and sexual disturbance. In another it is in the voluntary muscles, giving rise to flat-feet, lordosis, and round shoulders. Which system suffers most will depend to some extent upon the life that is led, but to a much greater extent upon the inherent constitution.

The patient may at first complain of symptoms in only one system. Yet when this is cured by treatment or is removed by operation some other becomes affected. Some practitioners are inclined to regard the condition as purely imaginary. This is not the case. The disordered function really existed before, but did not come through to consciousness. For it is well known that when there are two or more pains, only the more severe may be felt and consequently is the one of which complaint is made ; and when two definite diseases are present, each of which by itself gives rise to disordered function and pain, the patient may complain only of the more pronounced one. This is particularly likely to happen when he is ill. Most medical men have at some time or other been caught out by such a case. In the same way in asthenia it is only the more marked disorder that comes through to consciousness, though all organs are affected. At one time it may be a spasm, at another atony, at another some chronic infection, but the characteristic feature is the impairment of the general

health and a loss of the power of adaptability in some organ.

Adaptability.—By this is meant the power of an organ to respond to the demands that can reasonably be made upon it, and when these cease it can soon resume its position of rest. It is perhaps best illustrated by reference to the kidney, the stomach, and the heart.

The Kidney.—The secretion of urine maintains the composition of the blood in a constant state. If much fluid is drunk, much urine will be secreted and the specific gravity may be lowered to 1005. If little fluid is drunk, little urine is secreted and the specific gravity may be raised to 1040. This power of the renal cells to adapt themselves to changes that they have to face is characteristic of health, and the earliest sign of impaired function is their failure to do this. They may be able to secrete a urine of low specific gravity or one of high specific gravity, but they cannot do both.

The Stomach.—For the stomach to function properly, its muscle must be able to contract, to relax, and to rest. Relaxation is not, as was at one time thought, just the rebound from contraction. It is a graduated purposive movement. Rest is also not merely negative, as some are apt to think. It serves some purposive action that allows the building up of the cells to go on. A man in health is able to eat most foods and to swallow them as quickly as he wishes without suffering much discomfort. When the stomach is empty there is no sensation apart from that of hunger, and it is possible for him to feel at ease. The feature of a healthy organ is that it does not make its presence felt unless it is abused. If an increased action is needed for a long time its cells can hypertrophy. On the other hand, the asthenic has to be careful as to his food. He is upset by so many. He has to eat slowly and to limit the amount. But no matter how much care he takes, discomfort is likely to arise. This is even felt when the stomach is empty and at rest. It is the failure ever to be at ease that is

so characteristic of him. No hypertrophy of the muscle can take place. It seems as if contraction, relaxation, and rest are all affected.

The Heart.—Here again there is systole or contraction, diastole or relaxation, and rest, each of which plays a part in the function of supplying the tissues with blood, so that the cells can be properly nourished and their waste products removed. When the body is at rest the heart beats with a certain force and rate which on standing up are slightly increased, but soon return to the normal. With exercise both are increased, but after a short rest the former rate and force are resumed. This is the basis of the exercise tolerance test. It is the power of adaptability of the heart that is so characteristic of health. When an increased effort is needed for a long time, as in the athlete or in one who does heavy manual work, or when the heart works under disadvantageous circumstances, as in aortic regurgitation, its muscle hypertrophies by enlargement of the cells.

Factors that Modify Adaptability.—For adaptability to occur it is not only necessary for the cells of the organ to be healthy, but for the general health to be good. When the cells of the heart are poisoned, as in acute or chronic toxic states, its rate is increased even at rest and much more after slight exercise. There is now little increase of force ; and when an increased effort is demanded, there is a tendency for dilatation rather than hypertrophy to take place. On the other hand, if the health is impaired, not only is the rate of the heart unduly increased by slight exercise, but the increase persists for some time during rest. There is also a tendency for the beats to come through to consciousness, and palpitations are obvious even at rest. This is all the greater when the ill health has become chronic. It is dilatation, and not hypertrophy, that now takes place on increased effort. But no matter how good the health or how free an organ is from disease, adaptability will not take place once its connections with the central nervous system are divided. In ill health and in age adaptability

will be found to disappear before any impairment of function can be detected by any of our methods.

The Relationship of Asthenia to the Central Nervous System.—For the voluntary muscles to function at all it is necessary for them to retain their connection with the central nervous system, and this is also necessary for the proper function of smooth muscle. After complete division of the spinal cord the stomach and intestine continue to function, but their action then probably depends upon the intrinsic nerve supply or upon some connection with the sympathetic. But the muscular activity now is quite different from the normal, when all the movements were regular and purposive. The impairment is best illustrated in the bladder. After the cord is divided retention of urine usually ensues, though reflex micturition may be set up. But the action is spasmodic and jerky and it is rare for the bladder completely to empty. The condition is quite different from the graduated contraction of bladder muscle with relaxation of the sphincter characteristic of normal micturition. There is now little if any tendency for hypertrophy of the muscle to take place. There is no longer that adaptability to meet the slightest stress and strain so characteristic of a healthy organ. For this to take place, connection with the central nervous system must be maintained.

During the War injuries to the peripheral nerves were common. The muscles innervated from below the lesion lost their tone and became wasted ; trophic changes took place in the skin and sometimes a chronic type of ulceration developed. Though the patient was quite well in every other respect, no improvement followed until the nerve regenerated. In complete lesions of the spinal cord the muscles innervated from below the site of injury were paralysed and without tone. The mucous membranes were flabby and there was a tendency for an infection to arise and to persist, which was well seen in the case of the urethra and bladder. The skin was flabby and toneless. Bed sores were liable to arise and the ulceration tended to persist.

The difference between the part with a normal nerve supply and that without was marked. The parts innervated from above the lesion were healthy and full of life, but those innervated from below it were toneless. Though it could not be said that they were dead, it could hardly be said that they had vitality or any power to respond. Now the blood supply was adequate, the endocrines were working normally, and, as the reticulo-endothelial system was untouched, the production of antibodies could take place as in health, but there was no tendency for the tissues to overcome the infection or for the mucous membranes to regain tone. All this was due to the absence of the normal innervation. If only the nerve impulses could get through, those limbs and tissues would soon regain their vitality.

The comparison between the tissues in asthenia and those supplied by the spinal cord below the level of the lesion has always appealed to me. In both there is a want of tone in the muscles and there is little, if any, tendency for hypertrophy to take place to meet an increased need. There is flabbiness of the mucous membranes and skin, and a tendency for an infection to arise and to persist without any adequate reaction. Asthenia is characterised by a want of nerve energy. It is felt by both the patient and his practitioner that if only this could be produced he would be cured. Though tonics seem to be called for, those usually employed have little action in promoting a sense of well-being, and a blood transfusion, even if repeated, has little effect. Probably it will eventually be found that the primary lesion in asthenia is in the cells of the central nervous system and that the other systems of the body become involved secondarily. But as the nerve cells are extremely sensitive to certain changes, such as diminution in the amount of oxygen, or lowering of the blood pressure, a vicious circle is soon set up.

Disordered Function in Asthenia

In the functioning of every organ there appears to be a period of increased energy, a period of relaxation, and a

period of rest. Each of these serves some purpose and must be capable of being brought into action if adaptability is to take place. Each should be regarded as a separate phase of activity. Some are inclined to regard them as features of the activity of the same cell. Others look upon them as the reaction of an organ to stimuli coming from the sympathetic and parasympathetic. But a school is arising which believes that eventually there will be found in the basal ganglia of the brain three nuclei, one controlling the formation of energy, one controlling relaxation which is possibly connected with tonus, and one controlling sleep and rest. When the nerve cells are impaired, as in asthenia, all three or only one may be picked out. What this will be will depend upon the nature of the illness and upon the constitution.[1]

[1] Relaxation must not be confused with passivity or just doing nothing. The Victorians believed in work and rest. They did not believe that man needed any relaxation. But long before the War the error of this view was becoming obvious. The plan evolved at the public schools of 8 hours' work, 8 hours' leisure and 8 hours' rest was gradually being taken up by all classes. But leisure was looked upon as a time when the mental and physical activity was to be given over to the playing of games. As men grew older it was realised that something more was needed. Certain pursuits, leading to contentment and ease but not needing serious mental or physical activity, should be cultivated. Only by directing the mind into some suitable channel is it at times possible to relax and to obtain peace.

Buddhism teaches the destruction of desire, or Nirvana. This has come to be confused with the suppression of the mind and the adoption of passivity. But this is not the teaching of Buddha. The yoga states that the power of repose and the power to suspend certain mental activities are positive actions that are only to be acquired by careful training. It is in the latter sense that relaxation is employed here. By it is not meant the doing of nothing but rather the directing of the mind to dwell upon those quiet things of life that bring contentment and peace. For this, practice and the formation of a habit are as essential as in the training of the mind for activity.

Relaxation in its physiological sense is best exemplified by a reference to the bladder. When a rubber ball becomes filled with water the pressure within rises. But as the bladder becomes filled with urine there is no increase in the intra-vesical pressure. To permit of this the muscle fibres lengthen without being placed under any tension. This is due to their power to relax. When the desire to micturate arises, there is a sudden increase in the pressure which is associated with contraction of the muscle. If the sphincters now relax, micturition takes place. If this is delayed, the pressure again falls because of further relaxation of the fibres. A certain amount of contraction and relaxa-

In the hypersthenic it is the phase of relaxation that is the weak link in the chain ; with the hyposthenic it is the phase of contraction. When asthenia first affects the hypersthenic it is the impairment of relaxation that is most evident. He is unduly irritable. The pulse is rapid though the force is good, diastole being chiefly affected. There are hypermotility of the stomach, a tendency to hyperchlorhydria spasm of the intestine, and a tendency to mucous colitis. When asthenia first affects the hyposthenic it is the impairment of contraction that is most evident. The pulse is of low tension and tends to be rapid even at rest, though it is most evident after slight exertion. There are atony of the stomach, hypochlorhydria atony of the intestine, and constipation. Though mucus is also found in the stools, it rarely appears in masses or in the amount seen in the hypersthenic. But, as asthenia progresses, the impairment of each of the phases becomes more obvious and every case tends to pass more and more towards a common type.

This view of the cause of asthenia would explain certain points in its etiology. Where the constitution was previously sound, it so often results from one of the following :

1. Trauma to the head and spine, especially if associated with a loss of consciousness.
2. Continued mental strain or sudden severe anxiety.
3. Severe operations.
4. Sunstroke or heat-stroke.
5. The taking over long periods of alcohol, morphia, and cocaine, which are acknowledged poisons of the nerve cells.
6. Influenza, typhoid, and gas gangrene.

The possibility of some damage to the nerve cells from the first five is sufficiently obvious. The onset of influenza, typhoid, and gas gangrene is often associated with marked

tion of the muscle is possible so long as the local neuro-muscular apparatus is intact, but for them to be performed in the normal manner the connection with the spinal cord and mid-brain must be retained. We do not know whether relaxation and tonus denote the same thing. But for both contraction and relaxation to take place in the normal manner, the centre of tonus in the mid-brain must be intact.

nervous prostration. This can be due only to the action of some neurotoxin. Just as in diphtheria and anterior poliomyelitis neurotoxins are produced that have a preference for certain motor cells, so it is possible that in the former diseases neurotoxins are produced and become attached to certain cells in the basal nuclei, a condition which may last a long time. In this way can be explained the marked nervous prostration at the onset out of all proportion to the other signs, and the severe and protracted asthenia so liable to follow.

The Prevention of Asthenia.—In Chapter I the wisdom of many of the procedures for regaining health that have been so much advocated in recent years was questioned. For whilst sunlight, fresh air, and exercise seem to add to the nerve energy and bathing seems to act as a sedative, and a little of them improves the sense of well-being and does good, this can take place only when there is the power of response on the part of the constitution. Consequently too much can easily do harm. Whilst this may not be evident when the health is good, these procedures may predispose to that asthenia which arises after so many illnesses and nowadays seems to be on the increase.

The need for care during convalescence has been stressed in Chapter XVI, and the points there referred to should be borne in mind after most illnesses. It is not possible in this chapter to give the indications special to each. Only four problems will be dealt with.

Puberty and the Menopause.—At puberty and the menopause some great change in the nervous system takes place, for at both times there is a liability to a nervous breakdown. A similar instability to the menopause is also seen in men, though it is less marked. The young are allowed to play strenuous games or to be crammed for examinations and scholarships as they pass through puberty. Many a young life is wrecked in this way and much ill health of later life is then started. Rest is much more indicated than strenuous exercise. When a young person seems off colour, it is not

wise just to think, as some are apt to do, that it is due to masturbation or some such vice. It is much wiser to pay some attention to the type of constitution he has inherited and is now developing, and to consider whether less exercise and more graduated mental work may not be advisable for a year or so.

Operative Care.—Operating has become so safe and complications so infrequent that some surgeons have come to take no account of the constitution of the patient. Less attention has come to be paid to the building up of the health before operation. Perhaps on this account it is not infrequent to find some degree of asthenia after even simple operations. Whenever possible a patient should go away for a short holiday for a little rest. Too often this time is spent in a rush to get some work finished or his affairs put in order. The few days preceding the operation are often a big strain and the nerves are likely to be on edge. Sedatives during the day and a hypnotic at night make a big difference.

After the operation a longer period of rest is really needed. The surgeon is too apt to view the success of an operation by the length of time the patient stays in bed. There is really no advantage in getting the patient out of bed too soon. After even a simple appendicectomy it is better to keep him there for four weeks. This is not because of any danger of the wound breaking down. There is none. It is to give rest to the nervous system, which receives some trauma from every operation. A certain amount of shock and a period of asthenia, that is more or less prolonged according to the care that is now taken, are bound to follow. The surgeon often fails to recognise this, for there are no objective signs. But it is revealed by a feeling of fatigue after any exertion and by a tendency to nervousness.

After every operation a sedative and a hypnotic should be given until sleep is regained. I give for the first two weeks, whether insomnia is complained of or not, a little bromide or tinct. opii during the day and gr. 10 of chloral

hydrate by the mouth for the hypersthenic and a drachm of paraldehyde per rectum for the hyposthenic.

The custom of receiving visitors immediately after an illness or operation is to be deplored. The patient so often tries to talk and to be pleasant to all—which is a considerable effort and is a great strain on the nervous system at a time when rest is to be desired. A sick person does not want visitors ; he prefers to be alone.

Pregnancy.—If care is needed before and after an operation, it is equally so during pregnancy and the puerperium. The latter is not a matter of a few weeks ; it lasts for many months. It is essential to rest for an hour in the afternoon and for half an hour in the evening. I am doubtful whether the exercise, so often advised at this time, is beneficial. Since the bearing of the child must be a big drain on the resources of the mother, rest seems much more indicated.

Phylaxis.—Asthenia is very apt to follow the infectious fevers and particularly influenza and the common cold. In all probability it is due to some toxin that becomes attached to the nerve cell. The work of Billard on Phylaxis[1] is of great importance. He has shown that not only can neurotoxins attached to the nerve cells be displaced, but that if certain substances are given in time, the cells can be protected. His work is based upon the observation of a shepherd that sheep which had eaten the green shoots of the broom as they appeared above the snow in the spring became immune to snake-bites. He found that a guinea-pig injected with sparteine sulphate, the active principle of broom, could later be given more than five times the lethal dose of venom without harmful results. This was not due to the neutralisation of the venom by the sparteine *in vivo*. He showed that the sparteine combined with the lipoids of the nerve cells and as a result the venom could no longer enter, and was then destroyed by the body. He assumed that the sparteine impregnated the nervous tissue like a dye and so protected it from the action of toxin.

[1] *Phylaxis*, by G. Billard (Kegan Paul, Trench, Trubner & Co., Ltd.).

To this protective action he gave the name phylaxis. This protection persists for some time after the injection.

The value of small doses of Dover's powder in the common cold and in influenza has been recognised for years, particularly when given in the early stages. This action has been attributed to the sedative action and to the diaphoresis set up, but it is not seen in the sthenic fevers, such as scarlet fever and pneumonia. The action is most marked in the early stages of the asthenic fevers. The powder probably protects the nervous system against the neurotoxins, and they remain in the blood stream and are excreted, whence the diaphoresis. One dose is not enough. Small doses should be given so long as the rise of temperature continues.

If hexamine is given from the onset of the common cold and of influenza, the depression is less acute and there is less tendency to asthenia after the attack. This is not due to any antiseptic action upon the infecting organisms, for the concentration is too small. Hexamine also acts upon the nervous system, protecting it from the action of neurotoxins and displacing those already present. Large doses are not needed. Five grains of hexamine 6-hourly are a sufficient dose.

The Treatment of Asthenia.—The stage of onset must be differentiated from the established state.

The Stage of Onset.—This may be acute, sub-acute, or very gradual. The patient is really acutely ill. There is often rapid wasting, and fatigue is apparent even at rest. He is in need of careful nursing. Treatment should be carried out by rest in a darkened room and no visitors should be allowed. No work of any kind should be attempted. Hexamine and opium may be given for their phylactic action, but in this stage the dose should be very small. Relatives, and even nurses, often force food, as they think that the weakness and the wasting are due to want of it. Nothing could be more fallacious. In the acute abdomen, when expectant treatment is being carried out and food is withheld, it is surprising how well the patient looks, and what little wasting

takes place in ten days. The wasting seen in asthenia is part of the disease. It is useless to force food at this time. All the organs, like the general state of the patient, are exhausted. Little of the food is digested and what passes into the blood stream does not seem to go into the cells.

Much better results will follow if the practitioner forbids any food for some days, being guided by the patient's sensations. Any tendency to acidosis is overcome by giving alkalis by the mouth until the urine remains alkaline, and glucose by the mouth combined with small doses of insulin. No therapy that calls for a reaction on the part of the patient should be instituted at this time.

The Treatment of the Established State.—The outstanding features being the general weakness, the disordered function in many organs, and a tendency for a chronic inflammation to arise in one or more mucous membranes when the health becomes impaired, the practitioner will again and again be sorely tempted to direct the treatment mainly to the last two, particularly as the patient and his friends will often implore him to do so. They think that if these results could only be removed, health would certainly follow ; they do not realise that it is the impairment of the constitution that is the cause. The disorder is a part of a general asthenic state and its treatment is nothing more than the treatment of a symptom. Whilst it is important to pay attention to the mode of living, and to treat any disordered function if this gives any relief, therapy should be directed mainly against the disorder of the nerve cells.

The Treatment of the Nervous System.—Though it seems that in asthenia the primary lesion is one of the nerve cells, it must be admitted that we know little of what this is. Possibly there is some change in the cell that prevents normal functioning or in the lipoid membrane, stopping the entry of substances essential to vitality. Much attention has been given to phosphorus and its compounds as the nervous tissue contains so much. As inorganic phosphates have little action, organic phosphates have been

tried and recently the vegetable phosphates. It is assumed that the more nearly the compound given conforms to that contained in the nervous tissue, the more likely is it to have effect. But therapy is not quite so simple as this, and it is always doubtful that drugs do act directly. After all any phosphate given is broken down by the digestive fluids into constituents that can be absorbed by the cells and so pass into the blood, so that eventually it is of little importance what form is given. Even if it could be injected intravenously, it must be soluble in the lipoid membrane before it can pass into the nerve cells.

Overton pointed out that ether and chloroform produce their effect because they are soluble in the lipoid membrane of the nerve cell. Hypnotics act in the same way, and so diminish the activity of the cells. If any nerve tonic is forthcoming, by which is meant a drug that will improve nerve energy without calling for any response on the part of the cell, it will probably be one that is soluble in the lipoid membrane and has an action opposite to that of a hypnotic. Failure to appreciate that such a drug can act only if it is soluble in the lipoid membrane may be responsible for our failure to make any advance.

Caffeine and strychnine are not true nerve tonics. They act upon the nervous system and improve its power of conductivity and so enable nerve energy to be mobilised, but they do not increase it. Caffeine probably acts upon the brain ; strychnine, upon the spinal cord. Generally they upset the asthenic, who can tolerate only very small doses. His nervous system seems so vulnerable to slight influences. Whilst a little caffeine or strychnine may help him in the morning, it is better not to prescribe it throughout the day.

(*a*) **Drugs that act upon the centres of energy.**—The three I use for this purpose are mercury, gold, and tinct. nucis vom., though there are many more. Mercury is one of the best drugs we have. Its fattening effects have been known since the days of Abernethy. Sir Jonathan Hutchinson, one of the greatest clinical observers of all time, said :

"Not only in the syphilitic but in the healthy, and not only in man but in the lower animals, mercury if given in small enough doses may be made to assist the formation of fat and muscle. It also tends to increase the number of red corpuscles. Everything depends upon dose and upon the patient's idiosyncrasy. Whatever the idiosyncrasy, however, if the dose be reduced sufficiently, the drug may be made to agree. . . . The patient will often enjoy improved appetite and digestion and may gain in weight and colour. At the end of a year's course he may allege that he never was in better health in his life. Those who have suffered from constipation and liability to bilious headaches may get quite rid of these troubles and may continue permanently free. In women who have suffered from painful menstruation, the mercurial course may prove a complete cure of their trouble."

Now these are the conditions that are apt to arise in the asthenic. They are of the nature of functional disorders. The improvement due to mercury is possibly due to some action upon the nerve cell. But the improvement is not due to anything that it introduces directly, but to some response on the part of the cell. Much harm results from the failure to appreciate this. It is so often assumed that drugs act directly, and the greater the amount that can be given the better the patient will be. Now if the cells are not able to respond to a certain dose, much harm may be done if this is increased.

In asthenia probably all the cells and all the tissues are in the same state and it is unwise to call upon them for too much of a response. It is best to begin with as little as $\frac{1}{20}$ grain of hydrarg. cum crete and increase the dose slowly. When a dose is found that appears to benefit the patient, it should not necessarily be increased, under the supposition that twice the amount will do twice as much good. For with the cells in this state an additional demand may not be met and the mercury will then be likely to do harm. I cannot stress too much the importance of trying to find the optimum dose for a particular patient.

Gold salts were formerly given for neurasthenia. It is my impression that at times they do good in asthenia, but small doses must be given. 0·01 gramme of solganol every other day is given, though even smaller doses may be advisable.

Tinct. nucis vom. is of value if given in small doses, one minim three times a day being sufficient at first.

(*b*) **Drugs that act upon the centre of relaxation and modify tonus.**—Of these the best is undoubtedly opium, and at first the dose should be very small, one minim three times a day being sufficient. It is well to look upon relaxation as something that has to be created rather than as the cessation of activity. The action of opium in promoting the sense of well-being, so marked in those who are well, is less evident in those who are not well and may be scarcely perceptible in those who are acutely or chronically ill. This is explicable if it is assumed that the effect of opium is not due to solubility in the lipoid membrane, as in the case of ether, but depends on some response of the cell. If improvement does not follow a certain dose, increasing it may be useless, for if the health is poor the cells cannot respond. Sodium bromide, valerian, methylene blue, and cinchona have some effect, but the tendency has been to give too big doses. And over-stimulation of a cell may poison it. The more seriously ill a patient is, the smaller the dose that should be given. An increase in the power to relax, which can only slowly be produced in those who are ill, must be differentiated from lessened activity, that may resemble it so closely. The latter is seen when sedative drugs are given. It is my impression that they are two separate phenomena, for the latter can be easily produced, but the former only when the health is sufficiently good to allow the cells to respond. Morphia, for instance, merely decreases activity, and there is never any difficulty in producing this effect, no matter how ill the patient. But opium leads to an increase in the power to relax, yet this may not be possible when the patient is ill.

The alkaloids of opium, nux vomica, and cinchona have an action different from that of morphia, strychnine, and quinine. A friend who had suffered severely from acute rheumatism told me that morphia relieved the pain and so produced sleep; opium, on the other hand, did not relieve pain to the same extent but gave rise to pleasant dreams and to a sense of well-being. It was difficult to account for this until Billard by his work on the Phylaxis showed that not only could one toxin protect the nervous system against another, but this also applies to chemicals. Now morphia is dangerous because of its action upon the nerve cells; if this could be prevented from taking place, it would be excreted or destroyed by the organs of the body. Opium contains about seventeen other alkaloids. It is possible that, if the nerve cells have a preference for one of these which becomes fixed to the lipoid membrane, morphia may no longer be able to act upon it. In this way only is it possible to account for the fact that opium-eaters can take such large amounts with so little ill-effect. De Quincey was able to take 12,000 drops of laudanum a day. Whereas not only is morphia in big doses dangerous to life, but it is extremely demoralising. I am told by some of those who have practised in the East that the action of morphia in this respect is quite different from that of opium.

(*c*) **Drugs that act upon the centre of rest.**—After an illness the sleep of the hypersthenic is disturbed by dreams and is consequently rather restless. The hyposthenic may appear to sleep for the eight hours, but he wakes up little refreshed and seems to get so little benefit from it. He even feels worse than if no sleep had come. Perhaps what is regarded as sleep is only slumber disturbed by dreams not sufficiently vivid to come through to consciousness and so wake him. It might be better for him were this to take place, for rest is prevented by a series of suppressed nightmares.

The following is a type of insomnia that not infrequently occurs in asthenia. The patient goes to bed at 11 and wakes up at 2; no matter what he does, he may not be able to fall off again until an hour or so before he has to get up. Now it may not be wise to let such a patient try to sleep for

eight hours as in health. For the essential difference between asthenia and health seems to be that the power of adaptability is impaired, and this applies to sleep as to all other functions. Whilst a healthy man has little difficulty in sleeping eight hours right off, during which time he builds up energy for his work, the asthenic has difficulty in doing this, for he may be unable to store up energy to the same extent. Rest during the day may not be advisable. His waking up at 2 a.m. suggests that he has accumulated all the energy that can be stored and therefore he has had as much sleep as he needs. He should do some mental work, such as reading for an hour a book that is not too exciting but which requires some little effort. At the end of this time he should be given some hypnotic. Without this it seems as if the energy that accumulates during sleep cannot be properly stored and comes through and awakes him. For this reason sleep after 3 a.m. is so difficult.

Chloral is to be preferred for the hypersthenic, paraldehyde for the hyposthenic, and medinal if there is any disturbance of the gastro-intestinal tract. But big doses are neither advisable nor necessary. A small dose repeated in an hour is all that is needed With the asthenic the threshold between consciousness and sleep is slight. If it is only lowered a little sleep will follow, and a small dose often acts more effectively than a big one. If the right hypnotic is found, it is surprising what a small dose is required. If it does not act, it should not always be increased. The practitioner should consider whether it may not be the wrong one for this particular patient. For idiosyncrasy exists in regard to hypnotics as to other drugs.

The objection to paraldehyde is the taste, which is difficult to overcome. But many patients can tolerate it, if it is pointed out to them that it probably acts as a nerve food. After a time its taste becomes less noticeable, and in asthenia there seems no tendency for a larger dose to be required. One drachm should be dissolved in two ounces of chloroform water. It should be freshly prepared each week and

should be kept in the dark, otherwise it is decomposed into formaldehyde, which is very irritating to the stomach and is probably responsible for much of its ill repute. One ounce should be taken at 3 a.m. and one ounce on again waking. If a nurse is in attendance, 4 ounces of the mixture may be given per rectum at 3, thus avoiding the difficulty of taste.

It often seems that the improvement that follows the giving of moderate doses of the right hypnotic is out of all proportion to the sleep. This may be due to some beneficial action upon the nerve cells. In asthenia it is consequently wrong to withhold the hypnotic. No habit will be formed if the patient is not told what is being prescribed and is not given the prescription. If the practitioner does not himself dispense, it should be sent direct to the chemist. This is important, for, even if above the signature is written " In no circumstances must this prescription be repeated," some chemists will not hesitate to repeat.

(*d*) **The action of the aldehyde group.**—When hexamine is given as a placebo before cystoscopy, the patient not infrequently experiences a feeling of well-being and increased vigour. And in many functional disorders with gastro-intestinal symptoms, particularly about the menopause, hexamine has a beneficial action. It was difficult to account for this until Billard showed that it acts directly upon the nervous system. It sometimes does good in asthenia, but the dose must be very small. Paraldehyde and chloral hydrate have some similar action when given in small doses. Possibly this is dependent upon the aldehyde group.

The beneficial effect of a mature wine or brandy is probably due to the action of a volatile ester, which is soluble in the lipoid membrane. Their value has been hidden by the controversy as to the moral or social evil of alcohol, and by the failure to distinguish between the actions of the volatile ester, that forms as the wine matures, and of the ethyl alcohol.

Years ago when a fresh bottle of whisky was brought out, many drinkers used to insist on its being inverted a few times before any was poured out. They contended that the top half-inch or so contained the substance that brought contentment ; the rest the substance that gave body to the drink. The former contained the volatile ester, the latter the ethyl alcohol.

When a wine or whisky matures, certain volatile esters are formed, which give to it its bouquet, and upon them its value depends. It is the ethyl alcohol that leads to inebriation and lesser forms of forgetfulness and thus brings contentment to a mind that is worried. The volatile esters stimulate the higher function of the brain, for they increase vitality and improve thought.

The action of ethyl alcohol alone can be studied by taking spiritus vini rect. well diluted, though many of the modern whiskies and gins amount to little more than this. When taken to excess they lead to much ill health and they can be very demoralising. Gin was the national drink in Hogarth's days and his drawings show the demoralisation produced. Mature whiskies and wines are not so injurious. Those accustomed to take them to excess tell me that their state the following day will depend upon the degree of maturity of the wine. If it has been well matured any ill-effect soon passes off. The result must be due to the volatile ester having some phylactic action upon the nervous system, so that the ethyl alcohol can no longer enter the cells.

One volatile ester has probably not the same action as another. This is the reason why different wines have different effects. But it is very difficult to dissociate the action from that of such a powerful poison as ethyl alcohol. When men take wine together, they prefer the red. Claret and particularly burgundy lead to quiet talking and thinking ; though a vintage port is the prince of wines for this. When men dine with ladies, they will drink the white wines, such as liebfraumilch, sauterne, etc. These undoubtedly increase the vitality, though the queen of wines for this is champagne. If a sick man needs to be stimulated, brandy or champagne is ordered ; it is only rarely that burgundy and port are called for. Now the ethyl alcohol in all is the same. Their respective action must be due to the different volatile ester. One improves thought, another leads to

increased vivacity. Unfortunately they cannot be separated from the wines. For reasons I need not go into here, I am convinced that ethyl alcohol taken to any extent over a number of years does harm. So that even when a mature wine is given, the good effect of the volatile ester may be offset by this. For this reason there is an objection to even a vintage wine with the asthenic, for his nervous system is so vulnerable.

How the aldehyde group and the volatile ester act is uncertain. The action is so immediate and is seen so generally that no response on the part of the cell seems called for. Probably they act in the same way as chloroform and ether, affecting the lipoid of the cell, in which they may be soluble. The scientist who could prepare synthetically some substance of the same nature as the volatile ester would in this nerve-racked age confer a lasting benefit upon humanity.

Glucose and Insulin.—That glucose has some indirect action upon the nervous system has been known for some years. In certain asthenic fevers, such as diphtheria and influenza, nothing by the mouth gives any relief. Yet 10 per cent. glucose injected intravenously and followed by insulin produces immediate relief and a sense of well-being. It seems as if previously the end-products of the metabolism of sugar could not enter the nerve cells. In certain psychoses prolonged administration of big doses of paraldehyde is now carried out. This is often followed by malaise and asthenia. They are prevented if glucose and insulin are given at the same time.

In asthenia there is usually a hypoglycæmia, even when the patient takes large quantities of glucose. It seems as if when it is used up in the tissues it is not able to pass into the nerve cells. Insulin given twice a day may lead to a definite improvement. I give it at 11 a.m., as diabetics normally require a bigger dose of insulin after breakfast than at any other time ; and at 10 p.m., as it is possible that the insomnia found in the early hours of the morning may in some ways be due to defective carbohydrate metabolism.

The Acid State.—During the day the reaction of the urine varies, depending upon exercise, digestion, and other factors of which we are at present uncertain. In some people the urine is persistently acid. The acid state is then said to be present. It is physiological and must not be confused with acidosis, which is pathological. For there is never any change in the pH of the blood or in the alkaline reserve. This acid state is seen in those in good health who have plenty of nerve energy and a good resistance to infection. It is seen in those who have a tendency to high blood pressure, gout, and certain sthenic states. In asthenia and ill health the urine tends to be alkaline.

Clarke, of the Mayo Clinic, found that in chronic urinary infections a ketogenic diet renders the urine persistently acid and the infection clears up. This at one time was thought to be due to the antiseptic action of an acid urine. But chronic infections in other parts of the body also tend to clear up and the general health improves. The ketogenic diet has really led to some change in the constitution, as a result of which the acid state is produced. This offers an explanation for the improvement in the general health produced by certain drugs, such as acid hydrochlor. dil., boric acid, and acid sodium phosphate. They do not act because they are acids, for this would merely lead to a diminution in the alkali reserve. Probably they act upon the nerve cells as a result of which the acid state develops and ketones appear in the urine. But they can do this only when they are able to respond. Little is known how this occurs. Excessive doses should not be given. The ketogenic diet probably acts in the same way. In asthenia also there comes a stage in which the ketogenic diet and the acid-forming drugs may lead to a great improvement, but this again is possible only if the cells are able to respond. In asthenia at one time much improvement may follow the abstinence from food ; at another, the taking of much fat. Now each of these may lead to a ketosis and it is possible that the ketone group may have an action

upon the lipoid of the nerve cells similar to that of the aldehyde group.

Spiritus Chloroformi.—It is not uncommon to come across practitioners who have great faith in some drug whose use is empirical. Some years ago one whom I much respected strongly advocated spiritus chloroformi, which I have since prescribed. Sometimes in asthenia it seems to do good and some patients are quite definite on this point. It was difficult to account for its action until Billard's work on Phylaxis appeared. He showed that in cases of tetanus, chloroform can displace the toxin attached to the cell. May not spiritus chloroformi given for some time have a similar action? On the other hand, Sir Leonard Hill has shown that if methylene blue is injected intravenously in the living animal the nervous tissue remains unstained, but if the animal has been anæsthetised with chloroform the brain takes on a blue colour. The chloroform has produced some change in the lipoid as a result of which substances can now enter. May not spiritus chloroformi have some similar action in man?

This work on Phylaxis gives the clue to many things previously inexplicable. For instance, a patient with asthenia goes from one health resort to another with little if any improvement. He then goes to some spa, takes the mineral water and proceeds to get well. It has been difficult to account for such cases, as the tonic action claimed for these waters is doubtful. Many of these mineral waters have a definite phylactic action upon the nervous system, protecting it from the action of the neurotoxins and displacing those already attached.

In this chapter I have attempted to throw light on a problem that has baffled the profession for many years. Any of the several lines of treatment discussed may at times lead to definite improvement and even cure. Many of them depend for success upon the response by the patient, so that they have to be given to one with a particular type of constitution at a particular stage of the disease. The

difficulty is to know not only the right line of treatment, but that it is being applied to the right type of patient at the right time.

The problem is extremely difficult because we have no means of recording the activity of the nervous system. When this is forthcoming it should not be insoluble. Probably nervous activity is associated with some electrical response. In view of the great strides made in recent years in the recording of electrical phenomena, some instrument for recording nerve energy should not be impossible.

If the practitioner is ever to come to grips with this question of ill health, he must have some means of estimating vitality scientifically. Then he can know if the drugs that are being given do really act. At present he has to rely on his powers of observation and on the patient's sense of well-being. There is after all a big difference between a healthy man full of vitality and the asthenic with so little, and we ought nowadays to be able to record this.

In bracing places such as are found on the east coast, disturbances with the wireless are less common than in relaxing places. Eventually it may be found that the difference between the airs of certain places is bound up with certain electrical phenomena. The resistance of the body to an electrical current is said to be increased during sleep and when the health is impaired. Those who use electrical currents tell me that they have little trouble in estimating the current for a healthy person. But in the asthenic burns are liable to occur, as the resistance is so variable. There should be available to-day some method for estimating vitality as the weighing machine records the weight.

CHAPTER XXII

THE PRACTITIONER

In recent years there has been a tendency to decry the family practitioner. Patients wander from specialist to specialist or from clinic to clinic. They seem to think that recent advances of science have made the practice of medicine simple and that there is no longer any need for continuous observation. Nothing could be farther from the truth. For even if some scientific instrument were forthcoming by which the nerve energy or vitality could be assessed—and this still seems a long way off—it would tell us nothing about idiosyncrasy, which is much more common than is supposed.

Idiosyncrasy is an abnormal reaction in an otherwise normal person. It is seen in his reaction to drugs. One patient may take a grain of hydrarg. cum crete three times a day without any ill-effect, whilst another may show signs of poisoning from one-tenth of a grain. He thus has an idiosyncrasy to mercury. In the same way, patients react differently to disease, which never runs the same course in two. The treatment of each patient becomes a problem in itself, particularly as his ability to react to drugs varies from time to time. Though an idiosyncrasy persists in some form throughout life, it tends to become less as age advances or health becomes impaired. This abnormal reaction, which is seen in regard to exercise, to food, and to daily factors in living, and practically to any form of therapy, was recognised by the physicians of the last century, who paid great attention to it. It will always prevent the practice of medicine from becoming an exact science. The careful observations of the individual and the care given to his welfare will always be more important than the use of any

scientific instrument. Therefore the family practitioner can never become a thing of the past. The practice of medicine in Britain was once the envy of the world. This was due to the thoroughness of our practitioners. Their primary consideration was the welfare of the patient and they gave great consideration to his constitution. When, in 1912, research became organised in this country, attention was given to the elucidation of disordered function and the discovery of new diseases. Since then the endeavour has been to make of medicine an exact science by classifying disease. The patient has come to be regarded as of secondary importance and his welfare is at times neglected. Some practitioners are now content to regard him as a case of disease. It is only in this sense that the family practitioner can be said to be a thing of the past. Yet Hutchinson said :

" Let me add, in conclusion, and it seems to me of great practical moment, that the individual peculiarities of all patients should be carefully studied, and that they should themselves be made intelligently acquainted with them. There are few of us without our idiosyncrasies, and their variety is innumerable. If it should become the custom for parents to record some sort of life-history of their children in permanent form from birth or infancy onwards, noting all the peculiarities in an individual *by the aid of medical observation*, not only would much be done in the way of preventing subsequent errors in the treatment of disease, but valuable contributions would be made to our knowledge of its real nature. It is not only as regards the prescription of our drugs that a knowledge of our patient's peculiarities becomes important to us in practice. The advice we have to give in respect to places of residence, mode of life, and of general management is often of far more importance than the medicine prescribed. Its wisdom or the reverse may depend on our knowledge or ignorance of the individual peculiarities, and those peculiarities frequently do not display themselves in any of the existing symptoms, but can be recognised and revealed only by a correctly kept life-history."

This advice is perfect. The italics are mine, as it was unnecessary for Hutchinson to stipulate that the patient

should evolve around the family practitioner. In those days it was the custom to go to him on matters of health as well as of sickness, and people looked to him for guidance. Nowadays patients go direct to chemists, clinics, and specialists. The decline of the family practitioner is a tragedy in British medicine. He has a firmer grip of the practice of medicine than is commonly supposed. He can understand best the constitution and idiosyncrasy of a patient. He knows the weak points and the strong and how the patient reacts to disease, to drugs, and to the circumstances of his life. Such knowledge cannot be obtained by any test carried out in laboratories, but only by careful observation of the patient during the early years of life and by some acquaintance with the history of his family. It is as necessary in the maintenance of health as in the treatment of disease.

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