**Scourges of to-day (venereal disease, cancer, tuberculosis, alcoholism) / by E.T. Burke.**

THE MODERN HEALTH BOOKS

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*General Editor :* DR. D. FRASER HARRIS

# SCOURGES OF TO-DAY

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(The Scientific Press)

# SCOURGES OF TO-DAY

## (VENEREAL DISEASE, CANCER, TUBERCULOSIS, ALCOHOLISM)

BY

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WITH A PREFACE BY

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MEDICAL OFFICER OF HEALTH FOR THE CITY OF MANCHESTER


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# CONTENTS

# EDITOR'S INTRODUCTION TO THE MODERN HEALTH BOOKS

THE general attitude towards Health, in this country, has changed perceptibly during the last fifty years. Scientific analysis of the factors determining health and the increasing recognition that many of them are within human control have been responsible for the change. Passive acceptance has given way to active interest and to a conviction that the conditions of health, so far as they depend on the efforts of the individual, or of the community, should be regulated to the best advantage.

The citizen of average intelligence to-day knows far more than his parents did about the means of securing his personal health, and he is eager to know more still. He appreciates the importance of accurate information on such questions as diet, ventilation, exercise, the choice of his house, the care of his children, infections, and epidemics. But he is not satisfied with knowing only how to live the healthiest

life under present conditions: he has begun to believe that the conditions themselves can be improved, and good health become the birthright of mankind. He is convinced that even now fewer babies need die, and that throughout life there might be far less actual disease and invalidism.

This general impulse towards a healthier state of life is of immense value, but the driving force must be directed: we must know what we want. Practical aims must be based on scientific facts; but facts as distinct from theories and notions are not easy to come by. The Modern Health Books are designed to bring within the reach of every one the latest expert opinions on the chief problems of health. They will help the reader not only to live a healthy life himself, but to form a right judgment on all those questions which affect the health of the community. But the subjects to be dealt with are not only important; they are of fascinating interest. And as every volume has been written, for the benefit of the general public, by a first-rate authority, it is (as it were) a ticket of admission for all and sundry to the marvellous laboratory where Science is remaking the modern world.

D. F. H.

# PREFACE

BY R. VEITCH CLARK,
M.A., B.Sc., M.B., Ch.B., D.P.H.,
Medical Officer of Health for the City of Manchester

STUDENTS of public health movements will recognize this book by Dr. Burke as belonging to a group of happenings which are indicative of a stirring amongst the people, a cry for guidance in those things which make for improvement in their individual lives, so that they may strive along the lines which assured knowledge points out as the way to better things in store.

It is just over fifty years since the Magna Carta of Public Health—the 1875 Act—was passed, and it is fitting that, at the jubilee of modern preventive medicine in England, we should recognize the place filled by such a book as this in the more recent evolution of medical thought and popular need.

The work of these fifty years falls naturally

into two periods—the last quarter of the nineteenth century and the first quarter of the twentieth. From 1875 to 1900 the work of health authorities consisted mainly in meeting the great fundamental needs of closely aggregated populations. The violence and severity of epidemics of infectious disease, as well as the need for the ordinary decencies of life, demanded the full working capacities of these bodies for the provision of the fundamental requirements of a communal existence—viz. a pure water supply, an efficient system of sewage disposal, the provision of hospital accommodation for infectious diseases, and the clearance of slum areas. It is not implied that these problems are things of the past—we have them still with us, especially the difficulty of making adequate and healthy housing provision for the bulk of the people: much of the work of public authorities to-day is due to the constant skilled vigilance that these matters demand. Nevertheless we have already so fully reaped the benefit of these works of utility in the abolition of some infectious diseases, and in the diminished seriousness of many others, that the principles upon which such public needs have to be met are fully accepted, and so far as preventive medicine is concerned, the battle is won.

With the foundations then firmly laid, even though they do not yet extend over the full area of the temple of Hygeia, we have with the new century entered upon a more intimate and direct attack upon individual diseases and groups of diseases, and, what is much more important, we have begun to develop a communal realization of the principles of healthy living as the real way to prevent inefficiency, ill-health, and unhappiness. As was the case with the fundamental problems of environment, so it is with the evolution of the more personal attack upon disease. No lasting effects can be looked for unless we have behind us the solid backing of informed public opinion. The campaign is one essentially affecting the individual and the family, and, for success, the active, willing co-operation of the individual is essential. Maternity and child-welfare, school medical work, schemes dealing with tuberculosis and venereal disease, all are outstanding examples of preventive medicine in which success is being attained mainly because the public concerned realize the benefits aimed at, and themselves help to reach the goal.

Probably no field of public health activity illustrates this, by accomplished facts, so fully as does maternity and child-welfare. More than ninety per cent. of this work consists of

advice and help as to the rearing of infants and young children (the amount of treatment of illness is negligible): and yet in fifteen or twenty years the infantile mortality has been halved, and infantile sickness proportionately reduced. No more brilliant demonstration could be desired of the efficacy of team-work between wisely guided preventive medical practice and an actively coöperating public.

It is with the avowed intention of repeating this success in other directions that Dr. Burke has written this book. The four diseases discussed are not only themselves amongst the greatest "killers" but are intimately associated with numberless conditions of ill-health and inefficiency, the cause of which is unknown to the unobservant and the uninformed.

The vivid pictures of the destruction wrought by venereal disease, cancer, tuberculosis, and alcoholism are far from being overdrawn. No one who reads what Dr. Burke has penned can fail to realize the effort demanded of him in eliminating even in part the "four grim horsemen" from amongst us. A lifelong study of practical preventive medicine assures me that in this way, and only in this way, can the fulfilment of our hopes be attained. Scientific knowledge is of no value if it is to remain only academic: its value lies in its contribu-

tion to the sum of human happiness. War's victories, however dazzling their splendour, are only possible now to armies prepared by the efforts of science during times of peace. Similarly the struggle of modern civilized life demands a vitality and endurance only possible to a nation from which have been eliminated the great factors of physical and mental degeneration. Typhus and enteric fevers, plague, small-pox, and cholera have been crushed under our heels. It is not too much to hope that in one or at most two generations the dread days of these four diseases will have passed into history.

# INTRODUCTION

FOUR Grim Horsemen constitute the Scourges of Modern Civilization: Venereal Disease, Cancer, Tuberculosis, Alcoholism.

There has not yet been grasped, either by the laity or by the majority of the medical profession, the relative importance to the Public Health of these most grave menaces. While it is generally realized that all of them, jointly or severally, are factors productive of much human suffering and needlessly early deaths, it is not appreciated that their disabling and killing power is in the order in which they are named in the first sentence of this introduction.

Tuberculosis and cancer occur in the best-regulated families. They are more or less "respectable" diseases, and no disgrace attaches either to the family in which they occur, or to the particular persons who are affected by them. To the consumptive, loudly coughing his way into the Valley of the Shadow, kindness and sympathy are given. The full

meed of Christian charity is showered upon the victim writhing in the toils of malignant disease. But few cases of tuberculosis or of cancer remain undiagnosed; and on the death certificate the relatives have no objection, and the medical attendant no compunction, in inserting the correct diagnosis as the cause of death. The Registrar-General's Statistical Review, therefore, so far as these diseases are concerned, may be accepted as accurate.

With venereal disease, on the other hand, the matter is entirely different. There are three diseases which are known as "venereal": *syphilis*, *gonorrhœa*, and *chancroid;* and it is but rarely that any of these are alleged as a cause of death. For example, in 1924, according to the Registrar-General, there died in England and Wales from syphilis, 1,296 people; from gonorrhœa, 96; and from chancroid, nil. The physician making out the death certificate seeks to avoid wounding the feelings of relatives; and if the deceased has died from a venereal disease, he hides from the friends that fact, by using some less damning term. The syphilitic dies therefore from "cerebral hæmorrhage", "general paralysis", "aneurysm", "locomotor ataxia", "valvular disease of the heart", or from some of the other many conditions which are really manifes-

tations of syphilis. They mean syphilis, but these terms sound better.

When the statistics of the Registrar-General are examined in the light of the clinical and pathological knowledge we possess regarding syphilis, there is revealed a state of affairs unsuspected by the laity and not generally realized by the medical profession.

The late Sir William Osler analysed the vital statistics for the year 1915, when, according to the figures of the Registrar-General, the position was that out of the total deaths numbering 562,000, tuberculosis was responsible for 54,295, cancer for 39,847, and syphilis for 1,885. These figures, of course, merely represent the number of death certificates in 1915 upon which the words "Tuberculosis", "Cancer", or "Syphilis" were written.

It is considered no disgrace to die from any disease except syphilis and alcoholism. The general practitioner whose honesty was such as to compel him to insert the word "Alcoholic" before "cirrhosis of the liver", and "Syphilitic" in front of "cerebral hæmorrhage", in cases where these adjectives would represent the true state of affairs, would very soon find himself without a practice. Nevertheless it is a matter of common knowledge that in a vast

number of cases they ought to be inserted. In 1915 25,423 persons died from cerebral hæmorrhage; and the late Sir William Osler, from his vast and almost unrivalled clinical experience, calculated that in 3,000 of these cases the prefix "syphilitic" should have been used.

Syphilis delivers its death-thrust principally at the nervous and circulatory systems, and in view of this, Osler analysed the mortality statistics for 1915, with special reference to these systems. His conclusions may be tabulated thus:

| Disease as named | Total | Syphilitics |
|---|---|---|
| General paralysis | 2,263 | 2,263 |
| Locomotor ataxia | 735 | 735 |
| Other spinal cord diseases | 2,846 | 1,500 |
| Cerebral hæmorrhage | 25,423 | 3,000 |
| Cerebral softening | 1,472 | 500 |
| Paralyses | 2,983 | 500 |
| Other nerve diseases | 15,000 | 2,000 |
| Aneurysm | 1,141 | 1,000 |
| Organic disease of heart | 56,000 | 5,000 |
| Diseases of arteries | 10,000 | 3,000 |
| Total | 117,863 | 19,498 |

Sir Arthur Newsholme places the annual number of still-births at 100,000, and a survey of the literature shows that 20 per cent. of these are due to syphilis. This gives the yearly number of still-births caused by syphilis as 20,000. A moderate estimate is that of all the children below the age of seven years who die in a year—in 1915 there were 90,000—syphilis is the cause in 10,000 cases. Experience shows how frequently syphilis attacks the liver, the kidneys, other vital organs apart from the heart, the vessels, and the nervous system; and we shall err on the side of conservatism if we estimate the number of people dying from syphilis of these organs at 8,500. We can now compile the following table for 1915:

| Cause | No. of Deaths |
|---|---|
| Syphilis * | 1,885 |
| Nervous and vascular syphilis | 19,498 |
| Syphilitic still-births | 20,000 |
| Infantile syphilis | 10,000 |
| Syphilis of other organs | 8,500 |
| Total | 59,883 |

* Registered as such by the Registrar-General.

We therefore find for 1915 that syphilis takes the highest place among the killing diseases:

| | |
|---|---|
| Syphilis | 59,883 |
| Tuberculosis | 54,295 |
| Cancer | 39,847 |

In other words, of all deaths in England and Wales during 1915, 10 out of every 100 were due to syphilis.

An examination of the statistics for 1924 along the same lines is interesting and instructive. The total deaths in that year amounted to 473,235. Those due to all forms of tuberculosis totalled 41,103, while the number of people who died from cancer was 50,389. According to the Registrar-General, syphilis accounted for 1,296, and gonorrhœa for 96. The official figures therefore read:

| | 1915 | 1924 |
|---|---|---|
| Tuberculosis | 54,295 | 41,103 |
| Cancer | 39,847 | 50,398 |
| Syphilis | 1,885 | 1,296 |
| | 96,027 | 92,797 |
| Other Causes | 466,226 | 380,438 |
| Total deaths | 562,253 | 473,235 |

A further examination, however, reveals the following for the year 1924:

| Disease | Total | Syphilitics |
|---|---|---|
| General paralysis . . . | 1,544 | 1,544 |
| Locomotor ataxia . . . | 745 | 745 |
| Other spinal cord diseases . | 2,192 | 1,000 |
| Cerebral hæmorrhage . . | 26,785 | 3,100 |
| Cerebral softening . . . | 849 | 350 |
| Paralyses . . . . . | 2,202 | 400 |
| Other nerve diseases . . | 12,761 | 1,250 |
| Aneurysm. . . . . | 1,028 | 950 |
| Organic disease of heart . | 60,640 | 5,200 |
| Diseases of arteries . . . | 16,782 | 5,000 |
| Total . . . | 125,528 | 19,539 |

It will be observed that these proportions of syphilitic cases are slightly less than those given by Sir William Osler.

Taking the number of syphilitic still-births again as 20,000, the number of deaths from infantile syphilis as 10,000, and the number of people dying from syphilis of organs other than those already mentioned as 8,500, we arrive at the result shown in the table on the next page.

In 1924, therefore, of all the deaths—473,235—in England and Wales, 60,335 were due to syphilis, or approximately 12 per cent. Again, in 1924, we find that of the three diseases under

| Cause of Death | 1915 | 1924 |
|---|---|---|
| Syphilis * . . . . . | 1,885 | 1,296 |
| Nervous and vascular syphilis | 19,498 | 19,539 |
| Syphilitic still-births . . | 20,000 | 20,000 |
| Infantile syphilis . . . | 10,000 | 10,000 |
| Syphilis of other organs . | 8,500 | 8,500 |
| Total . . . | 59,883 | 60,335 |

review, syphilis is the " Captain of the Men of Death " :

| | |
|---|---|
| Syphilis . . . . . | 60,335 |
| Cancer . . . . . | 50,389 |
| Tuberculosis . . . . | 41,103 |
| | 151,827 |
| Other causes . . . . | 321,408 |
| Total deaths . . | 473,235 |

Gonorrhœa is not a great killer, but it is an intensely powerful race-poison. It is a *preventer of life,* and it delivers its main attack against the female pelvic organs of generation. Gonorrhœa is the commonest cause of chronic ill-health in women; and 25 per cent. of the

* Recorded as such by the Registrar-General.

serious operations that require to be performed upon the female pelvic organs are due to this disease and its complications. Of all women who are barren, in 30 per cent. of cases the sterility is to be accounted for by gonorrhœa. Gonorrhœa is the cause of blindness in children in 20 per cent. of cases. In the Registrar-General's Report for 1924, gonorrhœa killed only 96 people; but a moment's reflection will show that as a *life preventer* it must have inflicted much more damage than is indicated by that figure.

In 1915 acute and chronic alcoholism killed 497 persons, and in 1924 this amount was reduced to 127. A consideration of the effects of alcoholism will be found in a later chapter.

The immediately important point is that the analysis just made reveals the startling fact that venereal disease kills more persons annually in England and Wales than does the much dreaded tuberculosis or cancer. This is the first thing to be grasped in a perusal of this book.

The above estimate has been, and no doubt will be again, received with the cry of "Incredible!" Strange to say, a great deal of that incredulity comes from members of the medical profession. A doctor who has been for thirty years in a very large mixed practice

in a great city will exclaim : " I cannot possibly accept such a figure. I examine many thousands of patients a year, and I only see two or three cases of syphilis annually." What such a man really means is that he *diagnoses* only two or three cases of syphilis in twelve months. He *sees* very many more, but he does not always *recognize* the disease when he sees it. He may deal with a hundred cases of diabetes, but while they all have sugar present in the urine, he may miss the fact that in ten of them the presence of sugar is due to a syphilitic inflammation of the pancreas. But he has never been taught to think of syphilis ; he has merely been concerned with the symptoms of sugar in the urine—he labels the case " diabetes ", treats the *symptoms* with insulin, and does not consider what the cause may be.

He sees many cases of stomach trouble ; but it does not enter his mind that a certain number of them may be the gastric crises of locomotor ataxia—which is syphilitic. Because the patient with organic disease of the heart is a man of eminent respectability, syphilis is not to be thought of. Until the ubiquity of syphilis is thoroughly realized, until in every patient the possibility of this disease is thought of and eliminated, many thousands of cases will go unrecognized and untreated, and syphilis

will remain the most serious scourge of humanity. At present this fact is not realized; and it is one of the aims of this book to bring the reality of this menace before the public and the medical profession.

For centuries, venereal disease has been carefully concealed by a conspiracy of silence. Until within very recent times the subject lay in the gutter, battened on by the quack and the charlatan. It is only within the last two decades that the public, the medical profession, and the legislature have commenced to realize its vital importance. In Great Britain the subject has scarcely been taught in the medical schools; it has been too often regarded as a "side-line" to other specialities, tinkered at by all and sundry, from chemists in back streets to dermatologists.

Fortunately, and largely owing to the public opinion enlightened by the Great War, all that is changing. The subject has now become a compulsory one in the already overburdened curriculum of the medical student. The State has instituted a Venereal Diseases Scheme whereby treatment is administered free, under conditions of secrecy, to all who apply for it. In the large medical schools a few lectureships —too few at present—are being established, where men and women, highly trained and

experienced in the diagnosis and treatment of these diseases—people who have specialized in venereal disease—will be responsible for the teaching of the medical student. The practitioner of the future will be adequately trained, he will appreciate the essential Public Health aspect of the disease; he will grasp that it is not only a very common, but also a very deadly, human affection. He will realize that 60,000 annual deaths from syphilis is a disgrace to medicine and to the care of the public health; he will no longer cry "Incredible!" and run away from the problem, but with his knowledge and the modern means at his disposal he will tackle it as the Public demand it should be tackled, so that in a few years this enormous figure will diminish almost to the vanishing point.

I wish to express my thanks to Sir William Milligan for his kindly advice in the writing of the chapter on Cancer. My thanks are also due to Dr. Ellis Pigott for his helpful criticism and for his work in correcting the proofs.

MANCHESTER,
1926

E. T. B.

## CHAPTER I

# DESCRIPTION OF THE VENEREAL DISEASES

IN its original meaning, the term "Venereal Disease" indicated a disorder which was acquired during the act of sexual intercourse, or "venery", and which affected the organs of generation. At the present day, however, that interpretation of the term is no longer correct. It is now used to denote one or more of a group of three diseases known individually as *Syphilis*, *Gonorrhœa*, and *Chancroid*. The method by which, or the time when, these diseases are acquired does not essentially enter into the matter. All of them may be—and often are—acquired during the sexual act, which act may, or may not, be illicit. Infection with tuberculosis or scarlet fever may also be acquired during that act, but because that is so they are not, therefore, venereal diseases. A person may become infected with syphilis, gonorrhœa, or chancroid in quite a non-sexual fashion. It would indeed be an advantage in

every way if the term "venereal" became obsolete, and if these diseases were referred to simply by their individual and correct scientific names. It is probably too late in the day now to accomplish this, but nevertheless the old conception of the term "venereal" must be discarded although the word itself may be retained.

A great deal of harm results from regarding "venereal" and "immorality" as synonymous. The question of morality has but little to do with the matter from a medical, and has much less to do with it from any other, standpoint than is generally supposed. "Venereal disease" then, is merely a convenient short term with which to refer to the group of diseases known individually as syphilis, gonorrhœa, and chancroid, just as in the same way "eruptive fevers" indicates the class of diseases which includes small-pox, enteric fever, measles, and chicken-pox.

**Syphilis** is a very well-defined disease caused by a certain micro-organism, germ, or microbe known as the *treponema pallidum*. This is a small spirally-shaped body, its length being about the 7/25,000th part of an inch. It can thus only be seen under a very high power of the microscope. This microbe gives rise only to syphilis, and it is present in the body in all

stages of the disease. Syphilis can only be acquired by the implantation of the treponema pallidum into some part of the body. There are three modes by which this inoculation may be brought about:

(1) by sexual connection;
(2) by accidental means;
(3) by congenital contagion.

When syphilis is acquired during sexual connection the germ is transferred from the infected person into an abrasion—which may be microscopic in size—of the skin or mucous membrane of the other previously healthy person. There can be no doubt about most cases of syphilis being acquired in this way; and in consequence the site of inoculation is usually on some part of the genital organs.

The treponema pallidum enters the abrasion and takes up its residence there. It soon commences to reproduce itself rapidly, and some of the newly-formed germs find their way into the blood-stream and are carried by it to every part of the body where the process of multiplication continues. In from twenty to thirty days after the original inoculation, a small painless pimple appears at the seat of entry of the disease. This increases in size and eventually becomes a small ulcer. The time which elapses between the date of inoculation

and the appearance of the ulcer is the *incubation period.* The ulcer itself is termed the *primary sore* or *chancre.** When the chancre is on the genital organs it is called a *genital chancre.*

Sometimes one sees the ridiculous expression " innocent " syphilis or *syphilis insontium.* All that this really means is that the primary chancre is not on the genital organs. A chancre of the lip is not necessarily innocent. It may have been acquired during a normal or abnormal sexual act. To refer to syphilis by the terms " innocent " or " guilty " is absurd; the infection is genital, extra-genital, or congenital. There is no difference in the disease according to where the initial inoculation may have taken place.

The following scheme shows a convenient way in which syphilitic infections may be classified:

Syphilis { Congenital
Acquired { Genital
Extra-genital

Congenital syphilis occurs when a child, having been infected when in the mother's womb,

*The word is French and is derived from the Latin *cancer,* a crab.

is born with the disease. The mother of such a child is herself always syphilitic, although she may present no obvious symptoms. By means of a blood test, known as the Wassermann test, it can always be shown that such a woman has the disease. In some cases of congenital syphilis, the infection may be, though probably rarely is, conveyed to a healthy woman at the moment of the impregnation of the female germ-cell or *ovum* by the male cell or *spermatozoön* of a syphilitic father. In such a case the mother is really infected by the child while in the womb. As the child develops it is nourished by the mother's blood which circulates through the *placenta* or after-birth. This structure attaches the child to the womb, and the blood of the child passes from it along the umbilical or navel-cord to the child itself. As the child grows, the treponema pallida increase and multiply and pass into the maternal blood. The mother thus becomes infected although there has been no primary sore.

The more usual way in which congenital syphilis occurs, however, is for the mother to become infected through some abrasion, on the genital organs or elsewhere, at some time prior to conception. In such a case, where treatment has not been given or has not been

adequate, several pregnancies may occur, each of them terminating in miscarriage or "still-birth", until eventually, when the full virulence of the disease has somewhat abated, one pregnancy may proceed to full term and a living child is born. Such a child may present symptoms of the disease at birth. It may, on the other hand, be apparently healthy; and signs of syphilis may not manifest themselves for from two weeks to twenty years afterwards. Whether or not a child shows evidence of syphilis, the presence of the disease can practically always be demonstrated by the Wassermann test done on its blood.

Occasionally one sees congenital syphilis referred to as "hereditary" syphilis. This is a complete misuse of the term "hereditary". Even when an infant enters the world with signs of a disease from which either or both of its parents suffer, it must not be assumed that the disease is part of the inheritance. No disease which has a microbic cause can be inherited. What can and does occur is *contagion* from the parents, which is a very different thing from inheritance. While *predispositions* may be really innate and transmitted from parent to offspring, it is a biological truth that "*there are no inherited diseases*". Congenital syphilitics may, of course, produce

syphilitic children, that is, syphilis of the third generation; this is not inheritance but contagion.

One of the most pitiful of all sights is a typically syphilitic infant, either born with active signs of the disease, or in whom symptoms develop within a few weeks of birth. In the former instance such a child is undersized, thin, weak, and wizened. The skin is brownish in colour; it is wrinkled, and the muscles are flabby. The general appearance is that of a little old man. The eyes are inflamed, are sunk deeply into the sockets, and the expression is listless. Upon the skin appear eruptions of various kinds from spots to raw ulcerating areas swarming with the germs of the disease. Around the angles of the mouth and extending on to the cheeks and chin are radiating fissures. Large blisters may be present, especially on the palms and soles. When these burst, they leave discharging sores which eventually become covered with foul greenish crusts. The lining membranes of the mouth and nose are often the sites of eruptions, which, when present in the latter situation, give rise to the condition known as "snuffles". Eventually the nasal bones ulcerate and the bridge of the nose disappears, rendering the olfactory organ like that of a negro. The cry

of the congenitally syphilitic child is hoarse and rasping.

More frequently the child is born apparently healthy. After a time it commences to deteriorate ; it develops snuffles and the cry becomes hoarse. Various eruptions appear on the skin and mucous membranes. The kidneys may become affected ; there may be enlargement of the liver and spleen, and various inflammatory conditions of the eye may follow. Frequently the bones are attacked. If the child survives for several years, it may for a time remain in apparent good health, but eventually late manifestations develop. The most striking of these are an inflammation of the eyes, causing them to assume a " steamy " or " ground-glass " appearance (interstitial keratitis), and certain changes in the permanent teeth. These latter consist of the central incisors becoming peg-shaped, with a crescentic notching of the free border.

Congenital syphilis may attack the heart, causing degeneration of the heart-muscle and dilatation of the whole organ. Aneurysm or dilatation of the great artery which carries the blood from the heart—the aorta—is not uncommon. The respiratory system is frequently affected, and death results from syphilitic pneumonia. " Snuffles " and the involvement

of the nasal bones have already been referred to. The hoarse and rasping cry is due to syphilitic laryngitis.

The condition can best be briefly described by stating that every organ and every tissue of the body is affected. Perforation of the palate often occurs and this gives to the voice a peculiar character. This condition is frequently accompanied by deafness. The nervous system does not escape, and juvenile general paralysis presents a terrible picture. Mental deficiency is commonly due to congenital syphilis.

The tragic part is that it is all so unnecessary. Congenital syphilis is absolutely and easily preventable.

The following observations may be of some interest :

Out of 230 pregnancies occurring in families in which the parents had syphilis, 38 per cent. of miscarriages and still-births occurred. Of the children born alive, 18 per cent. died within five years, giving a total mortality rate of 56 per cent. Of the children who are alive at present, 38 per cent. give a positive Wassermann test, while only 6 per cent. are apparently cured. In all these latter, treatment was commenced within the first two weeks of life.

*Acquired syphilis* occurs when the infection is conveyed to a person at any time after birth. As has already been pointed out, the site of inoculation may be either on the genital organs or on some other part of the body. In the former case the infection is a *genital* one, in the latter case it is *extra-genital.* A genital infection is practically invariably acquired from an infected person during the act of sexual congress. The infected person has a syphilitic sore on the genitals, and the micro-organisms of syphilis, which are swarming on this sore, are inoculated into some slight abrasion of the genital organs of the healthy person. It must be borne in mind that an extra-genital sore, for example one on the lip, may also be acquired during sexual intercourse. If the infected person has a syphilitic sore of the mouth—a very common occurrence—and is kissed by the other person, the germ of the disease will be implanted into some small abrasion on the lip of the latter. It is important to realize that, no matter upon what part of the body the disease is implanted, the course and progress is the same. It is no more severe in one case than in the other. It is for this reason that any classification which brings in the question of right and wrong, of morality and immorality, of sexual and accidental, is absurd. Syphilis

is always syphilis, no matter how, when, or from whom acquired.

The following description refers to a case of acquired syphilis which is untreated. For convenience the course of the disease is divided into four different stages :

(1) Primary ;
(2) Secondary ;
(3) Tertiary ;
(4) Quaternary.

The incubation period extends from the time of exposure to infection up till the appearance of the chancre. This interval is hardly ever less than twenty days, and is usually longer. During this time the germs have been multiplying in the tissues at the site of inoculation, and by the time the chancre appears some of them have entered the blood-stream and been carried to other organs and tissues. By the end of the incubation period the organisms have set up a certain amount of irritation of the tissue at the point of inoculation, and this gives rise to a small red pimple. The appearance of this ushers in the *primary* stage.

In a few days the pimple becomes converted into a small and usually painless ulcer ; the surrounding tissues become hardened, so that when the chancre is grasped between the finger and thumb, the sensation is conveyed of a

button being felt through cloth. The lymph glands nearest to the chancre become enlarged and hard, but they seldom suppurate. Although at this time the chancre is a purely local lesion and there are no other signs, yet from the time of the inoculation the syphilitic virus has been permeating the whole body. The primary sore is merely a local manifestation of a disease which has already become general. That this is so is shown by the fact that if the attempt is made to re-inoculate with syphilis another part of the body of a person with a chancre, it will meet with failure. The patient is immune from further inoculation with the same disease. By the time that the chancre appears, the body of the infected person has produced a certain amount of antitoxin to the syphilitic germ. This is not sufficient either in quantity or in quality to destroy all the rapidly multiplying treponemata pallida, and, during this time, the syphilitic poison is not in sufficient concentration in the blood to give a positive Wassermann test: but the antitoxin is quite sufficient to prevent a fresh infection taking place. It is for this reason that as a rule only one chancre is found in an individual. When there are more than one, it shows that there must have been several abrasions inoculated at the same time. Where there is a multiplicity

of chancres they are all at the same stage of development. The primary stage, then, extends from the appearance of the chancre to the onset of constitutional signs.

The appearance of these latter heralds the *secondary* stage which supervenes, as a rule, within three months of the primary sore. The constitutional signs are many and varied. There may be aching pains in the bones, headache, and a slight rise of temperature. In all cases there is some degree of anæmia, which may occasionally be severe in type. It is the skin, however, upon which appear the most striking and characteristic signs. These occur in the form of rashes or "cutaneous syphilides". One of the earliest to appear is a dusky red mottling of the skin of the chest and abdomen. This is slight and often escapes the patient's notice. It is usually followed by the eruption of brownish red spots on the front of the forearms and on the forehead close to the scalp. This persists for two or three weeks. Practically every type of skin eruption may occur in syphilis, which may simulate closely every known skin disease. It is for this reason that syphilis has been called the Great Imitator, and it is on this account that the diagnosis of syphilis of the skin is so difficult, and why so many mistakes of omission are made.

It is peculiar that in white races the cutaneous lesions of syphilis do not itch, as a rule.

At the same time as the skin signs are showing, eruptions appear on the mucous membranes, especially those of the mouth and throat. Patches, like streaks of white paint or like glistening snail tracks, are found on the tongue, cheeks, and lips. The tonsils may become ulcerated and the vocal cords involved, giving to the voice a characteristic hoarse and husky quality. Inflammatory conditions of the eye are by no means uncommon.

This secondary period may extend for several years, during which time the patient is in a highly contagious condition. The sores in the mouth are literally teeming with the organisms of the disease, and other people may be infected by the patient's kisses, by using the same drinking vessels, tobacco pipes, and so on. The skin lesions, especially those which are moist and ulcerating, are likewise very infectious. After a time, however, all these superficial signs of syphilis gradually disappear, and there may occur an interval of several years in which all manifestations are absent or greatly reduced in severity. The secondary stage is thus distinguished by general eruptions on the skin and mucous membranes, which occur on both

sides of the body (bilateral), and are not confined to any one spot.

The characteristics of the *tertiary* stage are very severe. The disease now appears to concentrate its attacks upon certain areas or organs. The skin signs are not so diffuse as in the secondary stage. They are unilateral, and they have a great tendency to undergo severe ulceration. The typical lesion of the tertiary stage is known as the *gumma*. This is a node of fibrous tissue containing syphilis germs, which may occur in any organ or tissue. The most striking tertiary skin lesion is known as *rupia*. A "node" or gumma is formed under the skin and eventually reaches the surface. It suppurates, bursts, and becomes a deep, discharging, foul-smelling ulcer. As the discharge dries, a brown crust is formed; and as the ulceration continues, more and more crusts are produced. The ulcer increases in diameter as time goes on, and the freshly formed crusts, underneath the older ones, also increase in diameter. In this way a cone-shaped scab is formed over the ulcerating gumma, and the appearance of the patient becomes extremely repulsive. Apart from the skin, gummata may form in the bones, muscles, kidneys, lungs, liver, brain, and, indeed, in all the vital organs. It is obvious that when such organs are affected,

life is very seriously menaced and may become impossible.

In the *quaternary* stage the nervous and arterial systems are principally involved. The organisms of syphilis invade the brain, causing it to degenerate, and to give rise to *general paralysis of the insane*. This is the most terrible result of syphilis. At first the mental signs may be slight but they gradually increase in severity. One of the earliest signs is an alteration in the moral character. The respectable man becomes a roué, throwing himself wholeheartedly into every vice and immorality; or, on the other hand, the man who has been a "black sheep", suddenly reforms and becomes a religious maniac. Forgetfulness and loss of concentration are observed. The patient is easily fatigued both mentally and physically, and he begins to neglect his personal appearance. The sufferer is irritable and, for trivial causes, will give way to bursts of terrific rage. There then occurs the typical grandiose condition. The patient is all that is wonderful, he wields enormous power, is vastly wealthy, he is King of England or even God Himself; he has a million wives, he will promise to pay his doctor with a cartload of diamonds. "Fits" are common, and the general deterioration is, as a rule, rapid. Towards the end all mental

and physical power has completely disappeared. All that remains of a human being is a travesty of a body—worn, shrunken, immobile ; a mere handful of flesh and bones whose heart just beats, which is just able to breathe, from which the dejecta pass as it lies—a pitiable remnant of mortality waiting for the unutterable relief of death.

Occasionally in these cases of general paralysis there may be remissions for considerable periods, and the relatives of the patient may think that he has recovered. But this is only temporary. Inevitably the relapse will occur ; and if during the remission the patient has been allowed to control his affairs, the result may be ruin. Such a man will give away immense sums of money ; he will write cheques for enormous amounts ; he will pay a penny tram fare with a five-pound note and tell the conductor to keep the change ; he will order ten Rolls-Royce cars when his financial position would only justify the purchase of a second-hand Ford.

*Locomotor ataxia* occurs when syphilis attacks a certain portion of the spinal cord. The patient gradually loses the use of his lower limbs, he walks with his feet wide apart, and he adopts a high-stepping gait. He suffers from excruciating shooting pains in various

parts of his body, from gastric disturbance, and from certain eye symptoms. Eventually he becomes completely bed-ridden and then death closes the scene.

Various other paralyses and nervous diseases are due to syphilis of either the nervous tissues or the arteries supplying them.

It is in this quaternary stage that syphilis usually kills. At this time the germs of the disease seem to make a special assault upon the aorta, the principal blood-vessel of the body. This is the large artery which carries the blood from the heart to distribute it throughout the body. In some part of the aorta the germs of syphilis take up their abode, and they cause the wall of the vessel to deteriorate. Owing to the great pressure of the blood in this artery, the weakened part of the wall commences to bulge, and it gradually becomes thinner. As time goes on the wall of the aorta bulges out like a balloon. The patient experiences great pain and distress, and there is continually before him the fear of impending death. There is only between him and eternity the very thin wall of this aneurysm. A sudden movement, any emotion or strain, the slightest rise in the blood pressure, and the aneurysm ruptures. The treponema pallidum has taken another life.

The foregoing description has been necessarily brief, but the main points of a typical untreated case have been touched upon. It will be seen that from the commencement syphilis is a grave constitutional disease. Its initial symptoms are trivial, and herein lies its great danger. The patient does not realize from what he is suffering, and consequently delays treatment until some alarming manifestation drives him to seek medical advice. By this time the virus has firmly entrenched itself in his system. Syphilis has, even in untreated cases, intervals during which there is complete freedom from symptoms; but during such intervals the poison is working havoc internally, and inevitably signs of the damage wrought will eventually appear. In most of its stages it is highly infective. It is capable of being handed on to others in an accidental manner, and, worst of all, it is easily transferred to the offspring. There is no organ and tissue of the body which it spares; and we have already seen that its toll of annual deaths in England and Wales is 60,000. Surely then, its importance to the Public Health is obvious; surely every effort should be made to reduce this figure.

The non-sexual transference of the disease is both interesting and important. Three such

cases which have come under the notice of the writer within the last three years are worthy of quotation.

The first case was that of a member of the detective force of a certain city. This gentleman was sent by his own medical attendant to see the writer on account of a suspicious rash on the forehead and arms. Examination showed that this was an undoubted case of secondary syphilis, and this was confirmed by the result of the Wassermann blood-test. The patient denied any sexual exposure ; and there was no sign of the scar of any chancre on the genital organs. Cross-examination, however, revealed the fact that some eight weeks previously there had been a sore on the knuckle-joint of the left-hand middle finger. This had been slow to heal and the scar was still visible. It appeared that some time previously, when apprehending a man who was resisting arrest, the patient was bitten by the prisoner on this knuckle. As the prisoner was convicted and was then serving his sentence, it was discovered from the prison doctor that the man in question was suffering from syphilis and had syphilitic sores of the mouth. His bite undoubtedly infected the police officer. The unfortunate thing was that the detective had also infected his wife before he discovered what was wrong.

The second case was that of a young man who sought advice for a rash which was obviously syphilitic. Again there was no history of sexual exposure. This young man had, however, had a few teeth removed by an unqualified dentist; and when he was first seen, there was much ulceration where the teeth had been extracted. The result of the Wassermann test was positive. It was clear on investigation that the primary sore was on the gums, and had undoubtedly been caused by the use of unsterilized dental forceps. These had been used for the extraction of teeth from a patient suffering from syphilis of the mouth, and then, without being sterilized, had been employed upon this patient.

The third case has a direct reference to the fashion for "shingled" hair. The lady in question had her hair shingled. She then decided that it was necessary to have her ears pierced for ear-rings. This was done, and she departed for a few weeks' holiday with some friends, wearing two thin gold rings in her ears to keep the punctures open. A few weeks after her return she appeared to be suffering from secondary syphilis. Examination revealed a distinct scar on the lobe of the right ear. It was then discovered that while on holiday the discussion at afternoon-tea one day

turned to ear-rings ; and as all the ladies present were shingled, they insisted upon trying on a very fascinating pair of these ornaments which one of them was wearing. To do this the patient had to remove her gold rings, and in the process she probably made a small wound in the lobe of the right ear. At any rate, about four weeks afterwards, a sore developed which, from the description, was a typical chancre. The probability is that some lady at that afternoon tea-party suffered from syphilis of the mouth, and held one ear-ring between her lips while she removed the other from her ear, before handing them both to the patient.

Infection from drinking-vessels is not uncommon, as indeed one would expect it to be considering how ubiquitous is this particular disease. It is clear that, entirely apart from any question of illicit sexual indulgence, the possibility of extra-genital infection with syphilis is a very real one. It concerns every member of the community, and is on that account a subject of great personal interest to every citizen.

**Gonorrhœa** is an acute inflammation of the lining membrane of the male or female genital passages, caused by a specific microbe called the *gonococcus*. This organism is microscopic in size, its length being about 1/25,000th part of

an inch. It is kidney-shaped, and occurs in pairs which lie with the concave surfaces facing each other. These germs have no power of movement. When these organisms are deposited upon a mucous membrane they reproduce themselves very rapidly, setting up inflammation and suppuration, and thus destroy the tissues upon which they have taken up their residence. The incubation period of gonorrhœa is usually about five days.

In the male, the genital and urinary passages are for the greater part in common—one passage subserves both purposes. The urine is excreted by the kidneys, of which there are two. Leading from each kidney is a tube called the *ureter*. These pass downwards to enter the bladder and they conduct the urine to the latter organ. There the urine is stored until it is passed to the outside of the body. From the bladder there is a canal, termed the *urethra*, and it is along this passage that the urine is passed. The farthest back portion of the urethra is termed the *posterior urethra*, and lies next to the bladder. Its length is $1\frac{1}{4}$ inches (2·5 centimetres). Surrounding this portion of the urethra is a gland —the *prostate* gland—the ducts of which open into the posterior urethra. In front of the posterior urethra is a short portion measuring $\frac{3}{4}$ inch (1·5 cm.) in length, termed the *mem-*

*branous* urethra. This is a very delicate part, and it is surrounded by a muscle the fibres of which run in a circular direction. When this muscle—the cut-off (or sphincter) muscle—is contracted, the canal is closed and no urine can pass out of the bladder. Relaxation of the cut-off muscle allows the urine to pass along the urethra to the exterior. The remainder of the passage is known as the *anterior* urethra. The anterior urethra is pitted with the openings of numerous small glands. This canal runs along the body of the male organ—the *penis*—and the opening to the outside is termed the *meatus*. In addition to the ducts of the prostate gland which open into the posterior urethra, there also opens into it the end of the tube which comes from each testicle. This tube conveys the spermatic fluid and the spermatozoa from the testicle to the posterior urethra, from which, during intercourse, it is ejaculated along the canal into the vagina of the female. The first part of this tube, which is long, fine, and convoluted, lies just behind the testicle and is called the *epididymis*. It then becomes wider and straighter and passes to the posterior urethra ; this part of the tube is called the *vas deferens*. These anatomical facts must be grasped in order to comprehend the progress of a gonorrhœal infection.

Gonorrhœa in the male is practically always acquired during sexual intercourse. The possibility of the male urethra being infected from a water-closet seat is so remote as to be almost mythical. At the end of the sexual act, when ejaculation has taken place, there occurs a relaxation of all the urethral muscles. The effect of this is to induce a slight degree of suction, and when this occurs some infective material containing the gonococcus is aspirated from the genital passage of the infected female into the anterior urethra. The gonococci immediately proceed to reproduce themselves; they set up inflammation and suppuration, with destruction of the delicate membrane upon which they are lying. They thus penetrate deeper into the tissues and into the glands opening into the anterior urethra. In the beginning the disease is simply an acute inflammation of the front part of the anterior urethra.

Between from five to seven days after exposure to infection the patient experiences a slight sensation of heat and irritation at the meatus. The irritation is worst during the act of micturition, and is due to the urine passing over the inflamed area. About twenty-four hours after this, there is seen a slight clear discharge from the meatus, the lips of which are reddened

and have a tendency to stick together. This scanty, clear discharge is soon replaced by one which is profuse, yellow, and purulent. The amount steadily increases, it stains the linen, and it has a foul odour. Urination becomes increasingly painful as the inflammation progresses. The urine is found to be cloudy from the presence of pus. The whole penis may become inflamed and tender, and the glands in the groins may even proceed to suppuration. The passing of water now becomes agonizing, and the patient looks forward to the ordeal with dread. Owing to the irritation, the desire to urinate is much more frequent than normal; it may occur as often as every ten minutes. The inflammation gradually spreads along the canal till the whole of the anterior urethra is involved. Painful nocturnal erections occur, destroying sleep and reducing the patient to a physical wreck.

In a few cases, however, the attack may be so slight that, apart from the discharge, the patient experiences no great inconvenience. In favourable instances, after about three weeks, the disease has reached its maximum and thereafter begins to decline. The irritation disappears, the discharge decreases, until in from eight to ten weeks there are apparently no symptoms, and the patient regards himself

as cured. His only complaint may be that there is a glueing together of the lips of the meatus, and that there are a few threads to be found in the urine. That he is living in a fool's paradise is proved by the fact that a bout of drinking or of sexual indulgence will light up the whole trouble again, and the discharge will reappear.

Although a patient is apparently free from symptoms, he is by no means cured. The disease is simply lying latent ; it has become chronic. The canal has merely developed some degree of immunity from the germs, but that these are still present can be demonstrated by the microscope. If these germs are inoculated into the genital passages of a healthy woman, they will immediately take on a new lease of life and resume their former virulence. It is in this way that gonorrhœa is spread. It is handed on by the man who *imagines* himself cured. Such a one cohabits with his wife again, and most surely infects her. If he continues his cohabitation, she in turn will reinfect him with the rejuvenated descendants of his own gonococci and he will have a fresh attack of the disease. He may actually blame his wife for unfaithfulness, and for having acquired the disease from some other man. This is unfortunately only too common a story. Its genesis

is, of course, inadequate treatment and a low standard of cure.

The complications of gonorrhœa are many and serious. From the anterior part of the urinary canal the disease may spread backwards till it reaches the posterior urethra. Here the gonococci make their way into the prostate gland and form an abscess there. When this occurs, the abscess may burrow in different directions and may burst either into the bladder or the rectum with serious results. If an abscess does not form, the disease in the prostate may become chronic, and the gland may increase in size so that it blocks the outlet from the bladder, and consequently that organ cannot be completely emptied of urine. This residual urine becomes infected with various germs; inflammation of the bladder occurs, and the infection may even spread up the ureter to the kidney, causing permanent and grave damage there. Patients with latent prostatic gonorrhœa are the chief distributors of the disease.

As has been pointed out, the urethral inflammation causes damage to the lining membrane of the canal. When repair commences, these damaged areas become overgrown with fibrous tissue and consequently the canal becomes narrowed. This narrowing is termed

a *stricture*, and it is a very serious and progressive condition. The narrowing continues and eventually may become so severe that no urine whatever can be passed. The patient makes strenuous attempts to urinate, and these may result in rupturing the urethra behind the stricture. When this happens the septic urine finds its way into the surrounding tissues, these in turn become septic and suppurate, and eventually large areas become gangrenous and are sloughed off. The patient, of course, may die from septic absorption.

When gonorrhœa has invaded the posterior urethra, it may proceed along the vas deferens and epididymis towards the testicle. Inflammation of the epididymis is common, and is known as *epididymitis*. The pain of this complication is intense and the patient may be completely disabled. The epididymis, fixed to the back of the testicle, becomes enlarged and exquisitely tender. The inflammation may increase in severity, distending the sac in which the testicle lies until it reaches the size of a clenched fist or larger. There may be severe constitutional symptoms, the temperature rising to 104° F. After about a week the symptoms begin to subside; and in about three weeks' time the patient has neither pain nor discomfort. But in reality

the epididymis has not returned to normal. If it is felt between the finger and thumb, it will be found to be nodular and larger than the healthy one. The inflammation causes the bore of the epididymis to become obliterated, and in consequence no spermatozoa from that testicle are able to pass along it to the urethra. The patient is therefore sterile on that side. If both sides have been affected, then complete sterility results. The unfortunate man is no longer able to reproduce his species.

One of the most serious and disabling complications of gonorrhœa is gonorrhœal rheumatism. Here the germs have got into the blood-stream—usually from the disease having become chronic in the prostate—and have settled down in one or more joints. The affected joints become swollen and intensely painful, and the patient becomes seriously ill. It may affect one joint after another, until the patient becomes a helpless cripple. Gonorrhœa may occasionally cause heart disease of a particularly fatal character.

When the discharge from a case of gonorrhœa reaches the eyes, there is set up a most severe type of inflammation, which may result in complete destruction of the organ of sight.

*Gonorrhœa in the female* is a matter of the highest importance, which is due largely to the

anatomical arrangement of the female organs of generation.

Unlike the male, the genital and the urinary systems are, in the female, quite distinct. The female bladder lies in front of the generative organs, and it opens to the exterior by the urethra, which is only 1½ inches (3 cm.) in length. The urinary meatus of the female is situated at the upper and anterior part of the vagina and almost outside it. The vagina passes behind the urethra and leads to the entrance to the womb (uterus). This entrance is termed the *cervix*. The uterus lies behind the bladder and from the upper part of it spring two tubes, one on either side—the *Fallopian tubes*. At the free end of these are situated the ovaries, from which the female germ-cells pass along the Fallopian tubes to the uterus, where they are fertilized by the male spermatozoa, and in this way pregnancy occurs.

When gonorrhœal material is deposited in the vagina, it may find its way into the urethra, but usually the site of infection is the cervix. In other words, in the female the disease is as a rule one of the generative system and not of the urinary tract. The important point about this is that owing to the insensitive nature of the cervix, a woman may have severe

gonorrhœal inflammation of that structure without being aware of it. She usually has a discharge ; but discharges of various kinds are so common among women that it would appear that the majority regard such a condition as nothing abnormal. In consequence any moderate increase, unless it is accompanied by marked pain, bleeding, or very offensive odour, is, as a rule, neglected. This remarkable reluctance of women to give heed to abnormalities of their generative organs will be again referred to in the chapter on cancer, but it is undoubtedly the main reason why in private or in hospital practice one so rarely sees a case of early female gonorrhœa.

The disease extends up the cervical canal, burrowing in its progress deep into the numerous glands which open into that passage. Still the woman sees no signs and feels no symptoms, and in consequence she does not seek treatment. If she is a prostitute, either amateur or professional, she carries on her trade, infecting the majority of her clients. She would, in all good faith, show the most righteous indignation if one of them were to allege that she had infected him with gonorrhœa. The disease may not progress farther, but may settle down in the cervix in a state of chronicity but yet of high infectivity. It is such women, and

there are many thousands of them in England and Wales, who constitute the great untreated reservoir of gonorrhœal infection.

The disease may pass into the womb itself. This organ then becomes enlarged and painful, and there may be much discomfort and great loss of blood during the menstrual periods.

From the uterus, gonorrhœa may spread to the Fallopian tubes and ovaries, in which case great pain is experienced during menstruation. Suppuration may occur in the tubes, and then the unfortunate patient becomes seriously ill, with a rapid pulse and high fever. It is in these cases that a serious surgical operation has to be performed after the inflammation has subsided.

The rupture of such an abscess will cause peritonitis. The woman suddenly experiences violent abdominal pains accompanied by the characteristic signs of acute peritonitis—rigid abdomen, tenderness, fever, vomiting, rapid pulse, anxious look, prostration, and paralysis of the bowel. Death is by no means an uncommon result.

From the foregoing it will be clear that chronic ill-health, sterility, pain, and death are the grisly spectres that walk in the train of female gonorrhœa.

Gonorrhœa in female children is common.

The usual causes are the genitals of the child coming into contact with clothes soiled by gonorrhœal discharge, as by the sharing of toilet articles. One of the most terrible causes is when a child of tender years has been criminally assaulted by a man suffering from the disease. This is by no means of rare occurrence, and it springs from the myth that if a man with gonorrhœa has intercourse with a virgin he will get rid of the disease by giving it to her. An examination of reports from Assize Courts will show how prevalent is this pernicious belief.

Inflammation of the eyes of new-born children is a notifiable disease: and a large proportion—75 per cent.—of all such cases is caused by gonorrhœal discharge from the mother entering the eyes of the child during the process of birth. In England and Wales for the 53 weeks ending 3rd of January 1925, 6,267 cases of ophthalmia neonatorum were reported, and of these approximately 4,700 were gonorrhœal. A certain proportion of these children will be blind or have the sight permanently damaged.

**Chancroid.**—The last of the venereal triad with which we are concerned is Chancroid, sometimes known as *soft sore* or *soft chancre*,

or *pseudo-syphilis*. It is a disease which is of relatively little importance and is not very common. It has no connection with syphilis, although a chancroid may become a syphilitic chancre owing to syphilis having been inoculated at the same time. The incubation period is five days, whereas syphilis is not less than twenty. The treponema pallidum is not found in chancroid, but a rod-shaped bacillus known as the *bacillus of Ducrey*. Several chancroids may appear one after the other. They are always situated on the genital organs. No constitutional symptoms result, the disease being purely local.

## CHAPTER II

# VENEREAL DISEASE—HISTORY, DISTRIBUTION, PREVALENCE, ECONOMIC AND SOCIAL EFFECTS

"And the Lord spake unto Moses and to Aaron saying,

"Speak unto the children of Israel, and say unto them, When any man hath a running issue out of his flesh, because of his issue he is unclean.

"And this shall be his uncleanness in his issue: whether his flesh run with his issue, or his flesh be stopped from his issue, it is his uncleanness."—(*Leviticus* xv. *vv.* 1, 2, 3.)

THESE words were written 1,500 years before the birth of Christ; and the whole of the chapter consists of hygienic instructions laid down by Moses—the father of Medical Officers of Health—for the guidance of those of his people suffering from gonorrhœa. That he was fully aware of the contagious nature of gonorrhœal discharges is evident from the fact that he emphasizes that the patient's bed, his clothing, his saddles, and the utensils which he uses are contagious.

The above quotation illustrates in some degree the antiquity of gonorrhœa. It is probable indeed that the disease is as old as the human race. That a whole chapter of the *Book of Leviticus* is devoted to gonorrhœa shows that it was one of the most important and one of the most common diseases with which the children of Israel were afflicted. The rite of circumcision—an essential part of the Jewish religion—was probably introduced for the purpose of preventing one of the most common complications of gonorrhœa—*balano posthitis*. Until Moses took a grip of his people, and indeed for some time after, the Jews lived under very unhygienic conditions. The standard of sexual morality was exceedingly low. These two factors must have contributed in large measure to the spread of gonorrhœa among them.

Esarhaddon, King of Assyria (681–669 B.C.), who succeeded to the throne upon the murder of Sennacherib, is mentioned in the cuneiform inscriptions of the time as having suffered from gonorrhœa. Of Cleopatra (69–30 B.C.), the siren Queen of Egypt, it is recorded that she was a victim of this disease. About three hundred years before the Christian era, Hippocrates described gonorrhœa and gave directions for its treatment. The Greek philo-

sophers, Plato, Aristotle and Epicurus, all mention it; and it is interesting to know that Epicurus suffered from it in the days of his early youth. Seneca in his *Letters* records how Epicurus was afflicted with a stricture of the urethra which eventually prevented him from urinating. For fourteen days the philosopher attempted to cure himself by sitting continuously in a hot bath, and at the end of that time, having obtained no relief, he committed suicide. In the second century of the Christian era, Galen coined the term "Gonorrhœa", which is derived from two Greek words meaning "a flow of semen", thus indicating his mistaken conception of the pathology of the disease. From the very earliest times to the fifteenth century, literature, both medical and lay, contains numerous references to gonorrhœa, but there is never to be found any reference to anything remotely resembling syphilis. From the beginning of the sixteenth till the end of the eighteenth century the two diseases were regarded as one—"venereal disease".

Syphilis was unknown in Europe or anywhere in the Eastern Hemisphere prior to 1493. Before that date, although sexual diseases were ardently studied, no mention is made of syphilis. Had such a malady, with

its well-defined and glaring symptoms, existed, it must surely have attracted the attention of those voluminous writers who were so painstaking in their observations and so industrious in setting down their records and opinions in medical and philosophical treatises.

The first mention of syphilis was made in 1510 by Diaz de Isla, a Spanish physician, who practised in Barcelona, Seville, and Lisbon. In his book he describes how this new disease was introduced into Barcelona in 1493 by the crews of Columbus's ships on their return from the island of Española, or, as it is known at the present day, Hayti. Whenever a new disease is introduced into a community, it spreads rapidly and assumes a very virulent form. This is due to the fact that it is attacking a population which have developed no immunity against it. In order that a person recover naturally from a disease, his body must have produced an antitoxin to fight and overcome that disease. This antitoxin is produced in excess, and it persists for a variable time in the patient's blood after he has recovered. Upon exposure again to the same disease, no infection will result so long as the person harbours a sufficient amount of this antitoxin. This is called *immunity*. When any disease has existed in a community

for any length of time, a certain proportion of the population have become more or less immune from it; or if they are attacked, the disease occurs in a much modified form. In other words, the virulence of a disease varies inversely with the length of time it has existed among the population. It exhibits its greatest virulence immediately after its introduction.

When syphilis as a new disease is introduced into a newly-discovered savage tribe, it assumes the same serious epidemic characters as it did when it entered European civilization in 1493. The longer it remains, the less severe do its manifestations become.

After reaching Barcelona, syphilis became a European plague and spread in a rapid and alarming fashion throughout the civilized world. Entering France, it was carried by the armies of Charles VIII, king of that country, into Italy. In the Italian campaigns of 1494–5 it quickly spread throughout the length and breadth of the land. By the Italians it was referred to as the "Gallic Disorder"; and in the words of Cataneus, "it has never been seen in former centuries, and is altogether unknown in the world". Upon the disbandment of the mercenaries of Charles VIII after the siege of Naples, these soldiers of fortune, heavily infected with syphilis, spread

themselves all over Europe, seeking fresh war-like employment. Those who returned to France brought with them what the French people called "The Malady of Naples" Wherever these mercenaries went, so also went syphilis; and by the beginning of the sixteenth century it had become a universal plague.

Mediæval literature reflects the horror and consternation with which this epidemic was regarded. But gradually, as the population became syphilized, the violence of the scourge decreased; and with more peaceful times, with the raising of the standard of sexual morality, and with the discovery of a means of treatment, the destruction wrought by syphilis became considerably lessened.

Many labels were attached to the disease before it received its present designation. "*The Disease of the Island of Española*", "*Morbus Gallicus*", "*Morbus Neapolitanus*", "*La Grosse Virole*", "*Bubas*", "*the Great Pox*"* were all used. Fracastorius, a physician of Verona (1484–1553), published in 1530 a poem entitled *Syphilus sive Morbus Gallicus*. In this poem a shepherd, Syphilus by name, blasphemed against the gods, who in revenge

* Hence the expression, "*Small* Pocks (Pox)", to distinguish that disease from syphilis.—Editor.

sent a new disease to scourge mortals. The first to be attacked was Syphilus himself, and on this account the disease was named *Syphilis*. The poet-physician remarks: "It is a terrible malady spreading rapidly throughout the entire nation, sparing none, not even the King himself."

It may with great truth be said that from 1493 till the beginning of the nineteenth century the history of medicine is the history of syphilis. Medical inclination and public opinion demanded that careful study should be given to the disease; but much harm was done by the unfortunate confusion that arose between it and gonorrhœa. In 1530 the statement was made by Paracelsus that gonorrhœa was the beginning of syphilis, that there were not two diseases but one—"venereal disease". Those were the days when "authority" was more regarded than original observation, and so when the voice of the medical soothsayer spoke, all criticism was silenced and discussion was accounted heresy.

In 1767 the great John Hunter performed an experiment which was to silence for a time the few weak voices crying in the wilderness that there was not one venereal disease but two. He inoculated himself with some discharge from the urethra of a patient who had

gonorrhœa. Unknown to Hunter, the patient must have had syphilis as well. A few days after inoculation, Hunter developed a typical gonorrhœa; a month afterwards a chancre appeared and eventually all the signs of syphilis. Hunter then announced that gonorrhœa and syphilis were the same disease; and so great was his authority that his dictum met with almost universal acceptance. This unfortunate experiment retarded knowledge regarding these diseases for many years. The syphilis which Hunter acquired on that occasion eventually killed him, twenty-six years afterwards.

In 1793 Benjamin Bell, by inoculations on some of his students, boldly asserted the duality of the diseases; but his views went practically unheeded. The modern knowledge of syphilis begins with the Frenchman Philippe Ricord (1800–89), who proved conclusively, by over 2,000 inoculations, that syphilis is quite a distinct and separate disease from gonorrhœa. Oliver Wendell Holmes has described Ricord as "the Voltaire of pelvic literature—a sceptic as to the morality of the race in general, who would have submitted Diana to treatment with his mineral specifics, and have ordered a course of blue pills for the Vestal Virgins". The final proof

was of course supplied by the bacteriologist with his microscope. Neisser in 1879 identified the *gonococcus* as the cause of gonorrhœa,* and in 1905 Schaudin discovered the *treponema pallidum* and showed that it was the causal agent of syphilis.

Since then a great deal has been added to our knowledge of syphilis, especially as regards diagnosis and treatment. By means of the Wassermann test we are now able to tell when a person has syphilis even though there be no signs and the disease may be unsuspected. By means of the same test we can now tell when a patient is cured. Until the discovery of this test such a thing was impossible, with the result that many people who imagined themselves cured were still infected and were quite unknowingly handing the disease on to others.

In 1909 Ehrlich, a German scientist, made one of the most brilliant discoveries in curative medicine. He prepared a new substance for the treatment of syphilis, which he called *Salvarsan* or *606*. It received the latter designation because it was the six hundred and sixth substance with which he experimented. Although this preparation did not fulfil Ehrlich's

* Hence this is often referred to as "the gonococcus of Neisser".

ambition to discover a drug, one injection of which would result in complete cure, it was a tremendous advance upon all former treatment. Its curative effect was little short of miraculous when compared with that of mercury which had been the sheet-anchor of treatment for 400 years. Unfortunately this discovery was marred by the conduct of Ehrlich and his Teutonic colleagues.

It is one of the canons of medicine that there must be no secrecy about it. Any discovery that is made in the treatment and cure of disease is at once published and is fully explained to the profession, so that without delay its benefits may be applied to the relief of suffering humanity. This is, of course, not in accordance with the so-called "principles" of business and commerce; but the healing art is something immeasurably higher than these. Strange though it may seem in this materialistic age, the rôle of the physician has something sacred about it. He is dealing with human life, human health, and human happiness. He sees the very souls of his fellow-men stripped naked, in a way that not even a priest does. The greatest of all trusts is his to keep inviolate. Robert Louis Stevenson said: "There are men and classes of men that stand above the common herd: the

soldier, the sailor, and the shepherd not unfrequently; the artist rarely, rarelier still the clergyman; the physician almost as a rule. He is the flower (such as it is) of our civilization; and when that stage of man is done with, and only remembered to be marvelled at in history, he will be thought to have shared as little as any in the defects of the period, and most nobly exhibited the virtues of the race. Generosity he has, such as is possible to those who practise an art, never to those who drive a trade; discretion, tested by a hundred secrets; tact, tried in a thousand embarrassments; and what are more important, Heraclean cheerfulness and courage."

Ehrlich had discovered the most valuable remedy for the most serious disease afflicting the race. He had produced a weapon which would cut short the duration of the disease to a wonderful degree, which would cure, and which would result in the saving of many lives, and in the prevention of immeasurable physical and mental distress. It was with astonishment, therefore, that the world learned that the process of manufacture of this essential remedy was to be kept secret, and that the drug could only be procured from the makers in Germany, and then only at so high a cost as to make its use almost prohibitive.

On the outbreak of the Great War in 1914 the Allies found that the supply of "606" was cut off. Since, unfortunately, syphilis was not confined to the land of *kultur*, syphilitics outside the German Empire were unable to receive adequate treatment. It was therefore decided that, patent or no patent, Great Britain, France, and the United States would manufacture this substance for themselves. Searching tests were made, careful analyses were undertaken, with the result that in a short time salvarsan was not only being made in the Allied countries, but was being made of a better quality than the original German product. The triumph of British, French, and American scientific chemists was complete; and the position now is that the original salvarsan has been vastly improved and rendered much more safe for administration, and is placed on the market at a fraction of its pre-war price. The cost is now so low that under the Venereal Diseases Scheme of the Ministry of Health, this remedy is supplied *free* to the patients at the Treatment Centres, so that no matter how poor the syphilitic may be, he is assured of the best and most modern treatment known to science.

The more recent researches of Levaditi of Paris, regarding the value of bismuth in the

treatment of syphilis and of the substance named "190" as a preventive of that disease, are in no way less valuable than the discovery of salvarsan. They differ only in this, that their results have been freely placed at the disposal of humanity.

The geographical distribution of venereal disease is best described by stating that it is universal. Civilization and syphilization appear to go hand in hand. Our immediate concern here is, however, with Great Britain; but since venereal diseases are not notifiable, it is not therefore possible to give accurate statistics as to their prevalence in this country. The statistical report of the Registrar-General yields a little information; and by an examination in certain other directions it is possible to make an estimate which will not err on the side of exaggeration.

It has already been shown in the Introduction that in England and Wales approximately 60,000 deaths annually are due to syphilis. In that figure, however, are included 20,000 cases of miscarriage and still-birth; these must be deducted because that number represents only *potential* individuals who never had a separate existence. The position therefore is that syphilis killed, in 1924, 40,000 actual members of the community. The problem

now is to discover how many living syphilitics there were in that year.

Certain annual statistics are published by the Ministry of Health with reference to the Free Treatment Centres. In 1924 the actual numbers of cases dealt with for the first time were, 22,010 with syphilis and 31,272 with gonorrhœa, giving a total of 54,380. These figures only represent a proportion of a certain class of people, the "hospital class". They comprise only those in whom the disease has been diagnosed and who have no diffidence in attending at the Treatment Centres where, obviously, the secrecy and privacy cannot be absolute. It is clear that the incidence of venereal disease in the community must be vastly greater than those figures indicate.

It is difficult to estimate the percentage of people who have syphilis and die from it. While there are certain hospital statistics available, such as those of the Belle Vue Hospital in New York, where in 1911 there were admitted 555 cases of syphilis of whom 8 per cent. died, these contain many sources of fallacy. For example, the above figures only refer to diagnosed and treated cases in a certain class of society. They give no information as to the case-mortality rate among the undiagnosed and the untreated. Moreover, the

majority of patients are only under observation for a short period. In the untreated and in the inadequately treated syphilitic, the disease lasts throughout life. It cannot disappear of itself. While it is true that the syphilitic may lose his life in a charabanc accident or from enteric fever, yet a considerable proportion must die from the disease. One authority states that "almost half of all syphilitics eventually succumb as the result of their infection. Syphilis is therefore the greatest cause of death of men in the large cities".

Insurance statistics show that the syphilitic is a poor life-insurance risk. The mortality is very high; where 100 deaths were expected, 133 occurred. In Germany it has been found that the ratio of actual to expected deaths is 168 per cent.

After hearing a great deal of evidence upon the matter, the Royal Commission on Venereal Diseases* came to the conclusion that "the number of persons who have been infected with syphilis, acquired and congenital, cannot fall below 10 per cent. of the whole population in the large cities; and the percentage infected with gonorrhœa must greatly exceed this proportion".

* which issued its Report in 1914.

Several instructive Wassermann surveys have been done with the object of determining the incidence of syphilis among the population. Professor Louise McIlroy, M.D. and Dr. H. F. Watson performed this test upon 100 women who were attending a clinic for women's diseases in Glasgow. These women were of the working class, and the test showed syphilis to be present in 43 per cent. of cases. Dr. Ivy Mackenzie, also in Glasgow, examined the blood of 786 insane persons, and 44·1 per cent. were found to be syphilitic. She also found that a routine Wassermann test was positive in 15 per cent. of patients admitted to the wards of a general city hospital.

At the London Hospital Dr. Fildes found "that in a typical working-class population of London at least 8 to 12 per cent. of adult males, and 3 to 7 per cent. of adult females have acquired syphilis". Sir F. Mott's results from the examination of 1,483 patients in the infirmaries of Shoreditch, Westminster, and Paddington, showed 20 per cent. of cases of syphilis. In the United States, Dr. Warthin, from careful post-mortem examinations of persons in a country district, who died from diseases other than syphilis, came to the conclusion that at least 30 per cent. of the community were suffering from this disease. This

estimate may seem to be very pessimistic, and yet it is based upon sounder data than any of the others. Syphilis was not diagnosed unless there were present in some tissue or organ either the organisms of syphilis or the characteristic cellular reactions produced only by the activities of these organisms.

If we follow on the lines of Dr. Douglas White and assume that the larger towns constitute two-fifths of the population, and that this population is affected with syphilis to the extent of 10 per cent., the remaining three-fifths of the people must have a syphilitic incidence of at least 5 per cent. Since the whole population of Great Britain amounts to 40,000,000, of which 16,000,000 dwell in large cities, and if 10 per cent. of these are infected with syphilis, we arrive at the figure, 1,600,000. Of the remaining three-fifths of the population, 5 per cent., or 1,200,000, are syphilitic, giving the total number as 2,800,000.

If we assume that at least an equal number suffer from gonorrhœa, we get the venereally infected population of this country amounting to 5,600,000. Although this is an appalling figure, there is one charge which cannot be laid against it, and that is that it is an exaggeration. It is the very reverse. It is a vitally urgent matter that the public should

be made to grasp the significance of this figure, and to realize that here is a canker eating into the very vitals of the nation.

There is a tendency for those of the upper and middle classes to think that venereal disease is of rare occurrence among them, however common it may be among those on a lower rung of the social ladder. It is this belief which accounts for the apathy with which the former classes regard this most serious problem. An examination of the following table extracted from the Report of the Royal Commission on Venereal Diseases, will show how ill-founded this conviction is:

MORTALITY RATE FOR SYPHILIS AND SEQUENTIAL DISEASES PER MILLION LIVING

| Class | Social Status or Occupation | Death Rate per Million | Order |
|---|---|---|---|
| 1 | Upper and middle . . . | 302 | III |
| 2 | Intermediate between 1 and 3 | 280 | IV |
| 3 | Skilled labour . . . . | 264 | V |
| 4 | Intermediate between 3 and 5 | 304 | II |
| 5 | Unskilled labour . . . . | 429 | I |
| 6 | Textile workers . . . . | 186 | VI |
| 7 | Miners . . . . . | 177 | VII |
| 8 | Agricultural labourers . . | 108 | VIII |

It will be observed in Classes 5, 4 and 1 the incidence is strikingly high, while in 8, 7 and 6 it is exceedingly low. From the above table it would appear that syphilis is most common in the highest and in the lowest social classes. In considering these figures, however, it must be borne in mind that the death-bed of the lowest classes is most often in some institution, where the diagnosis is more apt to be correct and where there is less compunction on the part of the medical attendant in certifying the cause of death as syphilis. While, therefore, the figure for Class 5 is approximately correct, it is more than probable that that for Class 1 is too low. The majority of syphilitics also in Class 1 are treated, and do not succumb to the disease, so that this is another reason why the mortality rate given is an under-estimate of the incidence of syphilis among the living in Class 1.

The smug and self-righteous satisfaction of the majority of people of Class 1 that their caste is comparatively free from venereal disease is therefore utterly unjustified. There is a very great probability that a thorough investigation would demonstrate that it is the most heavily infected section of the community. Most of the readers of this

book belong to that class, the one possessing the most intellectual and political power in the nation; and it behoves them, therefore, to realize the danger which threatens them and their families and to insist upon the most thorough measures being taken to combat it.

The table shows that the two most important classes in the nation are those most affected by syphilis. Class 1 is the governing class; its members constitute the brain and intellectual vigour of the country, and the poisoning of that class by a disease which more than any other destroys and saps the physical and mental well-being, must be a most serious calamity not only to the country but to civilization generally. Class 5 constitutes the brawn of the people; within its confines is the bulk of the population, and every other class is to a greater or less degree dependent upon it. This class is the raw material from which the fabric of civilization, industry, and capital is woven. Any deterioration of that raw material has the inevitable result of rendering the finished article of lower quality, of making it "shoddy".

The scourge of venereal disease is easily tackled. The machinery for the purpose has already been erected; all that is required is

the will and the intelligence so to use it that it may work at its full efficiency.

The great fault at present is the unwillingness to recognize the ubiquity and the killing power of these diseases. Until that is thoroughly appreciated, much of it will go unrecognized, much of it will go inadequately treated. It has been found that about 30 per cent. of patients attending the Free Treatment Centres do not complete their treatment. That proportion of optimists think that the disappearance of the grosser signs and symptoms indicates the cure of the disease. The shattering of this fool's paradise comes in later years when the disease is so well "dug in" that complete eradication is impossible, or when, after marriage, congenitally syphilitic children are born to such people. The treatment of venereal disease is expensive to the State, and yet, because it is given free to the patient, he seems to regard that which is given for nothing as worth nothing. The stopping of treatment before complete cure simply means that what has been given has been wasted. One's own opinion is that until some element of compulsory confidential notification and treatment is introduced, a great deal of time, skill, and money will be utterly wasted.

If proper methods are adopted after exposure to venereal infection, the disease can be prevented. The function of medicine is primarily to prevent disease; and in so far as raising moral standards will help towards that end, then it is the duty of medicine to make full use of it. Unfortunately, even in these days, there still lingers in many quarters the idea that venereal disease is part of " the wages of sin ", and that since it is a punishment inflicted by a wrathful Deity upon the wrongdoer, any attempt to protect the sinner from such punishment is impious. Fortunately such a savage conception of divine justice is passing away, and the sooner it entirely disappears the better.

In conclusion, one would stress the high importance of early diagnosis and treatment. This lies partly with the public and partly with the medical profession: both must be taught. The former must be taught to seek advice at the earliest moment; the latter must be trained to recognize the disease and to administer modern and adequate treatment. It is heart-breaking to find patients coming in despair to the Treatment Centres as a last resort after having been treated for syphilis and gonorrhœa for years with bottles of medicine, which would have been just as effective,

as regards cure, if they had been applied to the patient's boots.

These diseases can be cured, and cured easily, if the general public and the general practitioner will only co-operate.

## CHAPTER III

# CANCER

THERE is probably no word in the English language which strikes so much terror to the mind as "Cancer". It is thoroughly recognized that this disease is not only a common one, but that it is a mighty killer inflicting a most painful death. In 1924 it slew 50,389 people in England and Wales alone.

Cancer appears usually in the form of a tumour or swelling. Tumours are, however, of two kinds—*innocent* and *malignant*; and cancer belongs to the latter variety. An innocent tumour is simply a local circumscribed growth, exhibiting its severity according to its proximity to vital organs. When remote from such it is merely a nuisance and a disfigurement. In their immediate neighbourhood, an innocent tumour may cause much suffering, and even death, by its pressure upon such organs. Innocent or non-malignant tumours produce no constitutional disturbances. Such growths bear a close resemblance to normal

tissues. They are enclosed in a capsule sharply demarcating them from the surrounding tissues, and enabling them easily to be shelled-out intact in the operation for their removal. After such an operation they do not tend to recur. In their growth, innocent tumours do not invade neighbouring tissues; they merely push them aside and compress them. Unless subjected to injury, non-malignant growths neither bleed nor ulcerate.

Malignant tumours differ from the foregoing in that their cellular structure in no way resembles that of any of the normal tissues. The essence of malignancy appears to be that under the influence of a stimulus, some of the body cells take on new characters both as to appearance and conduct. They "see red"; they become Bolshevik. They do not acknowledge the laws of the body; they live in a state of cellular anarchy, parasites upon the tissues. Multiplying with great rapidity, and destroying everything in their path, such tumours penetrate in all directions, sending invading columns into the surrounding tissues. They have no capsular frontier; and for this reason, unless the operation for their removal has been done very early and has been of a wide and sweeping character, there is every likelihood of their early recurrence. Small

pieces of the original growth may become broken off and carried in the blood- or lymph-stream to other regions, there to increase in size and to give rise to secondary tumours as malignant as the parent. Cancer attacks the overlying skin, ulceration occurs, and hæmorrhage of a more or less severe character may result. Malignant disease produces severe constitutional disturbances, the patient rapidly falling into a condition of pronounced ill-health known as *cachexia*. He becomes pale, thin, and debilitated; the skin is sallow, and there may be a greater or less degree of fever. These symptoms are due to the absorption of poisonous material from the tumour during its growth. Death occurs from ulceration, hæmorrhage, pressure on some vital organ, sepsis, cachexia, or from some combination of these.

Scientifically, the popular term "Cancer" embraces two distinct types of malignant tumours: (1) sarcomata and (2) carcinomata. Sarcoma is the name given to any malignant tumour springing from the connective tissues. A carcinoma is a malignant tumour originating in epithelium such as the skin or the lining membrane of the digestive tract. It may also arise from any of the glandular structures.

The sarcomata have an abundant blood-

supply, the vessels being merely spaces between the groups of malignant cells. These tumours, therefore, bleed very easily; and the close relationship between the blood and the sarcomatous cells explains the ease and frequency with which the cells become detached and are carried to distant parts of the body, there to inaugurate new Bolshevik republics.

The cells of a carcinoma are derived from already existing epithelium. Their great characteristic is their unrestrained and unlimited power of reproduction. While carcinoma may occur on any epithelium, there are certain situations where it is very common—the skin, breast, stomach, intestines, and the womb. It is spread, not so much by the blood, but by continuous growth along the lymphatic channels.

No further distinctions will be made between sarcoma and carcinoma; both will be referred to under the general term "Cancer".

Cancer is one of the most ancient diseases known to man. It is referred to in the Ebers' papyrus which was written 1,500 years before the birth of Christ. Down through the ages it has stricken high and low; from the beginning of history the problems of its origin and of its treatment have seriously exercised the minds of men, and with singularly little result.

Innumerable *theories* have been formulated; extraordinarily few *facts* have emerged.

In any disease it is always interesting, and sometimes useful, to study its racial and geographical distribution; but to do so with reference to malignant disease is a matter of more than a little difficulty. There is much evidence to show that cancer is apparently a disease of civilization, and that it is rare among the more barbarous inhabitants of the globe. The workers under the Imperial Cancer Research Fund, however, seem to have arrived at an entirely different conclusion, and they hold that among primitive races cancer is common. The great difficulty here is that reliable statistics relative to the diseases and causes of death among primitive peoples are not available. The Central African savage with the hand of death upon him crawls into the darkness of his squalid hut to meet his doom alone. Neither the wailing of all his wives nor all the incantations of the witch-doctor over his corpse can give any information as to whether he died from cancer or from powdered-glass administered by a rival. Until such statistics are available (and when that comes to pass, these people will be no longer primitive but will have become in some degree

tarnished by civilization), no comparison between the incidence of cancer in the savage and in the cultured is possible.

It is a fact, however, that in a highly civilized community, *cancer is the second commonest cause of death*; and it has been argued from this that there may be some factor or combination of factors operating in that civilization which forces this disease into such a high position as a taker of life. So far as can be gathered, one is not aware of any evidence that cancer occupies nearly so important a place among primitive races. While it is admitted that malignant disease is seen among peoples who are uncivilized, the bulk of opinion seems to be that it is, comparatively speaking, rare. One can scarcely credit the dying native with possessing some mysterious means of diagnosing cancer in himself, and, having done so, of considering himself taboo and thereupon skulking off into the jungle to die. It does not seem reasonable to suppose that if he is suffering from some non-malignant disease, he will then have no objection to setting out for the "Happy Hunting Grounds" from the ward of the Mission Hospital. Yet medical missionaries see little cancer among their savage patients.

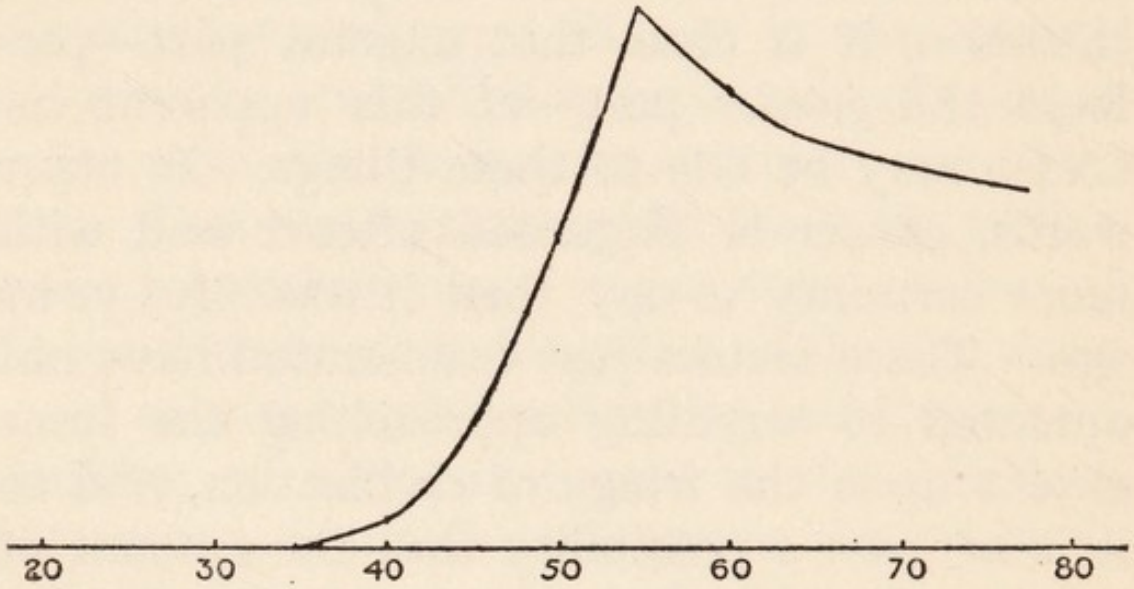
The facilities for the diagnosis of cancer

are immeasurably greater in London than in Lhassa; and it is within the last fifty years that this advance in diagnostic methods has taken place. During the same period an alleged increase in the amount of cancer has taken place. It is extremely doubtful if this increase is entirely real. When one considers during the last five or six decades the increased frequency of exploratory diagnostic operations, the larger number of post-mortem examinations performed, the great advances in diagnosis and in general medical and surgical training, and the increase of accuracy in death-certification, it is clear that a great part—perhaps the *greater* part—of this apparent increase may be due to these things. In other words, cancer is diagnosed oftener and with more certainty to-day than it was fifty years ago. These factors just enumerated have not operated to anything approaching the same extent upon the fringe of civilization, and so it is at least a possibility that the amount of cancer thought to exist among primitive peoples is considerably under-estimated. It would appear then that at the present time there is nothing very definite to be obtained from a racial and geographical survey of cancer.

It is not proposed in this book to discuss, or even to enumerate, the many theories rela-

tive to the cause of cancer. What is required is to indicate the few facts which exist, and to lay stress upon the important practical bearing which they have both from the individual and the communal standpoint.

Cancer has a very striking relationship to the age of the individual. It is extremely rare below the age of 35; above that, it is extremely common. The practical point here is that the danger zone is indicated. The following curve illustrates the incidence of cancer during the years of life from 20 to 80:




From 20 to 35 there is practically no tendency to the disease. The liability begins to show itself from about 35 by a slight and gradual rise. From 40 to 50 this becomes most marked by a rapid and steep increase which reaches its maximum at 55. Thereafter

the tendency appears to decrease somewhat till the end of life. The falling of the curve from 55 onwards may not be a true picture: there are fewer people living at that period of life, and although the liability to cancer may be actually increasing, other diseases such as pneumonia are common then, and, in a person with malignant disease, may cause death before cancer is diagnosed, or before it kills.

The curve does illustrate very clearly, however, that the cancer age supervenes just after maturity is reached; that as the normal physiological decline of the body begins and as that decline progresses, so does the incidence of cancer increase. This, of course, does not mean that if cancer appears in an individual aged 55 years, that the cause has only then commenced to act. It may have been in operation for many years, and only after a certain stage of bodily deterioration is reached does it manifest itself as actual disease. It seems clear, from the age incidence, that the occurrence of malignant disease is related in some way to general bodily degeneration. In other words, when the breaking down or *katabolic* processes exceed the building up, constructive, or *anabolic* processes, is the time of the commencement of the age of malignancy: the ground is prepared for the cancer growth.

Sex has a considerable influence, women being more frequently affected than men. This is because of the frequency with which cancer occurs in those organs peculiar to the female: the womb and the breasts. If malignant disease of these special organs be left out of account, and only those organs considered which are common to both sexes, it is found that cancer is more prevalent in the male sex.

The following table, giving in round numbers the sites of fatal cancer according to sex for ten years, is instructive:

| Site | Male | Female |
|---|---|---|
| Female pelvic organs | — | 48,000 |
| Breast | — | 40,000 |
| | — | 88,000 |
| Tongue | 20,000 | 3,000 |
| Gullet | 12,000 | 4,000 |
| | 32,000 | 7,000 |
| Stomach | 37,000 | 33,000 |
| Bowels | 38,000 | 43,000 |
| Liver | 18,000 | 26,000 |
| | 56,000 | 69,000 |

The above figures indicate that the principal sites of fatal cancer are the female organs

associated with child-birth. Apart from these it will be seen that malignant disease kills most often through the digestive tract. A closer examination demonstrates that *cancer attacks the male above the stomach, and the female below that organ.* In the lower digestive tract the female deaths exceeded the male by 13,000; while in the upper part of the alimentary canal, cancer kills in ten years 25,000 more men than women.

The plentiful display of advertisements for those pills which are declared to be "worth a guinea a box", and the constant appearance in the newspapers of the picture of that cheery and acrobatic gentleman with the "Kruschen feeling" is evidence of the fact of the extreme prevalence of constipation. While this is true of both sexes, it is equally true that women are greater sufferers from this than are men. Whether it is or is not a relic of the Victorian modesty which forbade women to have intestines, there undoubtedly exists among the female sex to-day a deplorable lack of interest in the lower part of their digestive apparatus. Many modern women of the highest moral character will go for a week or more without a motion of the bowels, and will feel much less concerned than if their menstrual period were twenty-four hours overdue. Some women, who

would be acutely distressed if their tooth-brush were lost for half a day, will retain their fæces for a week without mental or physical discomfort. The constipation is only remedied by recourse to purgative medicines; and no sooner is an evacuation of the bowel obtained than the constipation is once more established. This is once more treated in a similar manner, and so the procedure goes on for years. The lower bowel is subjected to chronic irritation from stagnant fæces, poisonous material is absorbed, and there are occasional outbursts of acute intestinal irritation from the ingestion of purgatives. The two characteristics of civilized femininity that would strike a Martian observer are constipation and child-bearing. There would appear to be a prima facie case for some relationship existing between chronic constipation and the frequency with which the lower part of the alimentary canal of women is attacked by cancer. This applies in a much less degree to men; and it is no exaggeration to state that of all the constipation in the world, the overwhelming majority of cases occur in the female sex.

There are three factors which act more especially upon the upper digestive tract of men, namely, smoking, the taking of alcohol, and over-indulgence in food which is often

highly flavoured. These " vices " may or may not be more heinous than chronic constipation: they are " sins of commission ", and they do at least give some temporary physical satisfaction. Where the male and female digestive indiscretions resemble each other is in the fact that they both constitute perhaps mild, but certainly long-continued, sources of irritation to the epithelium lining the canal. Whatever other factors there may be, it is an undoubted fact that local irritation in an individual above a certain age in some way stimulates the cells so irritated to take on malignant characters.

There are numerous other sources of irritation which give rise to cancer. Workers with the X-rays sometimes suffer from a chronic irritation of the skin—dermatitis—in consequence of prolonged though intermittent exposure to these rays. It is unfortunately no uncommon thing for such areas of skin to become cancerous, and several X-ray operators have died from this. Those whose employment entails the handling of tar, soot, paraffin, and pitch, sometimes develop cancer as a result of their work. This is frequently seen among employees in the Scottish shale-oil industry. The tar and oil which form part of the constituents of soot give rise to what is

known as "chimney-sweep's cancer". In Lancashire there have been several instances of mill-operatives developing cancer of the scrotum—"mule-spinner's cancer". This is due to the oil from a certain part of the loom splashing on to the front of the workman's trousers. The oil percolates through to the skin, and unless absolute cleanliness is maintained and there is frequent changing and washing of the clothing, the continued irritation results in the development of cancer. It has been found that in these tars, oils, and soots minute traces of arsenic are present, and this constituent has been thought to be responsible for the irritation. It is well known, of course, that arsenic has a tonic and stimulating effect upon the skin when given in suitable doses. The difference between stimulation and irritation is merely one of degree. In certain cases of arsenical poisoning the main symptom is an intense inflammatory condition of the skin.

Cancer is definitely linked up with syphilis and tuberculosis. Cancer of the tongue often follows upon syphilis of that organ, and it is a most difficult thing to say when the syphilitic condition first becomes definitely malignant. When treating oral syphilis it is most important to warn the patient against smoking, the

taking of alcohol, and the indulgence in hot and seasoned foods. All these will irritate the lesion, and may provide the necessary stimulus for the production of cancer. In persons over forty years of age, tuberculosis of the skin may take on malignant characters. This is predisposed to when irritating applications have been used for too long a time. It is by no means rare to find cancer occurring in a healed tubercular scar on the skin.

From the foregoing it will be clear that *cancer has a local origin*. No doubt in this, as in many other diseases, some people are more predisposed than others. This *predisposition* may be hereditary. It is important here to realize that no *disease* is hereditary in the true biological sense. The predisposition to cancer consists in a familial tendency for the body-cells to break away from the normal, to have a leaning towards anarchy, a lack of something in the bodily make-up which normally would check that tendency. One might refer to it as *unstable cellular equilibrium*.

In such persons the stimulus need be only very slight for malignancy to develop. Again, certain other diseases, particularly those of a suppurative nature where there is absorption of poisonous material, may so alter the health of the body-cells that they are more adversely

affected by local irritation than they would be normally. This is exactly what happens after the middle period of life. Then, everything is on the down grade, the human machine—slowly, perhaps, but none the less surely—is wearing out, and the cellular elements of the body are less able to withstand damage. These are all *predisposing* factors, and are of vast importance in the causation of cancer. Anything which causes a general lowering of the threshold of resistance is predisposition, and if in addition there are present certain forms of local irritation, then malignant disease occurs at the point where that irritation is applied.

At one time the view was held that cancer was a general disease of the blood in which local outbreaks occurred. This opinion was fostered by the experience that the removal of cancerous growths was always succeeded by a recurrence in a short time. Surgeons of former days did not realize that the malignant cells were not confined to the tumour itself, but that invading columns had spread wide of the cancerous area as recognized by the naked eye. It is only within comparatively recent times that the mode of tumour-growth has begun to be understood. Modern microscopical work has shown that when there is quite

a small cancer of the breast present, malignant cells may already have invaded the other breast and have penetrated as far as the glands lying in the arm-pit. The operations which used to be done for removal of a cancerous tumour were not sufficiently thorough. They did not embrace a wide enough area. Some cancer cells were invariably left behind, and in the course perhaps of a few weeks there was a recurrence. The surgeon of to-day knows that in removing such a tumour he must extend his operations wide of the actual swelling which can be seen or felt. He must get beyond the microscopic frontiers of the disease. When this is done in an early age, recurrence is unknown; if it is done in later life, recurrence is rare.

The knowledge that, in the beginning, cancer is a strictly local disease, enables one to say without any qualification whatever that *cancer is curable.* The local origin of cancer is proved by the following considerations: (1) when it first appears it is invariably single; (2) it arises in places subjected to local irritation; (3) it occurs in people who present no signs of any constitutional disturbance; (4) microscopic examination shows that the cancer cells decrease in number the farther one gets from the tumour until a zone is reached in

which none are present; (5) a small fragment of cancer, transplanted into an animal, grows centrifugally and in exactly the same manner as occurs in man. These facts are the firm foundations upon which treatment and cure depend.

But here another very vital point arises: although it commences locally, cancer very soon finds its way into the system of the patient. Its great characteristic as a rule is rapidity of growth and of dissemination throughout the body.

There is, therefore, in every case of malignant disease a certain short period when it is strictly local in character and when its complete removal without fear of recurrence is possible. At the present day the cure of cancer therefore depends upon *early diagnosis coupled with early and complete removal.*

Early diagnosis rests with the patient. The important thing which each member of the community has to grasp is that after the age of forty years any abnormal swelling in the female breast, any wart or sore on the lip or tongue, any abnormal hæmorrhage from the female genital passages, is more likely to be cancer than any other thing. When this is appreciated, then no one but a lunatic will delay in seeking advice. It is too important

a matter upon which to consult a herbalist or the district nurse. It may be suicidal to be content with even a medical opinion such as: "No, I don't think it is cancer." The patient is entitled to *know* whether it is or not; and this knowledge is available if it is demanded. A trivial operation, painless under a local anæsthetic, a snip from the tumour, a microscopical examination, and the truth lies before him. If the verdict is unfavourable, immediate operation means Life; delay means Death as surely as if the person concerned were shot through the brain.

The situations where cancer is most likely to occur are: breast, uterus, mouth, stomach, bowels.

**Cancer of the Breast.**—In many homes one will find hung, usually above bedroom mantelpieces, excellent and helpful texts culled from the Holy Scriptures; in many commercial offices, one finds framed admonitions to "Do it now", and presumably these things have been found of some value in directing the thoughts respectively to spiritual improvement or commercial advantage. There can be no doubt that if, every morning of their lives after the age of thirty-five, all women read, pasted on to their bedroom mirrors, these

words: "*A lump in your breast is probably cancer. If you would save your life see about it to-day*", a great deal of agonizing illness would be prevented, and many years of health and usefulness would be gained. At the present moment there are many thousands of women in this country, each with a small lump in the breast, and each one fears that it may be cancer but hopes that it is not. They keep the matter to themselves, dreading to know the truth, until such time as it can be concealed no longer. By that time, of course, all chance of cure has disappeared. It is a peculiar thing that women will gladly accept and even suggest an operation when the disease is so advanced that nothing short of a miracle can bring about recovery, while they shun the surgeon's aid when cure is certain. The only explanation is ignorance; and to dispel that, is one purpose of this little book.

In the early stages operation does not involve any risk to life; there is no pain; there is no disfigurement; and in fourteen days the patient is not only physically well, but all mental distress is at an end. Women themselves are directly responsible for the 5,153 deaths from mammary cancer in 1924. When they have grasped the facts set out above and have acted upon them, death from cancer of

the breast will be an exceedingly rare occurrence.

**Cancer of the Womb.**—The menopause, or "the change of life", takes place during the cancer age. Many a woman's health and life have been, *and are now* being, sacrificed by attributing to this occurrence the great sign of cancer of the uterus—*slight bleeding at irregular times*. Whenever this sign is observed, it is suicide for any woman to delay seeking medical advice. This is proved by the appalling fact that 98 per cent. of women suffering from uterine cancer die of it. By the time that the majority of these patients reach the hands of the surgeon, operation is futile. Statistics show that when an early diagnosis is made, 38 per cent. have no recurrence during an observation period of five years. If every case came under competent observation upon the first appearance of irregular bleeding, that is, when the disease is purely local, then it could most certainly be cured.

**Cancer of the Mouth.**—This applies especially to men. Cancer in the lip is almost exclusively a male disease, and it usually occurs on the lower lip. What is often diagnosed as cancer of the lip in a woman, usually

turns out to be syphilis. In any man over the age of forty years, a wart or sore occurring on the lip is practically certain to be malignant. Delay again means death. The password to life is " immediate action ". While the disease is local, the operation is a trivial one; a simple-looking sore is just as dangerous as any other malignant growth: if the patient procrastinates, mischief may have been already done.

Cancer of the tongue at once makes its presence felt by the discomfort, or perhaps actual pain, attached to it. There is thus, in such cases, no excuse for delay in seeking advice. From the tongue cancer is very rapidly carried to other parts of the body and this is an additional reason for immediate action. The delay of a few weeks may banish all chance of cure. Malignancy of the tongue is one of the most urgent of all diseases. When the condition has progressed beyond the operative stage, there lies between the patient and the unspeakable relief of death many weeks of agony in which the powers of speech and eating are gone. Only a high appreciation of the sanctity of life can withhold the placing of the means of self-destruction in the patient's hands. A small wart on the tongue, a few white-paint-like patches, a small sore which is reluctant to heal, on the side of the organ, are almost cer-

tainly cancer in any man over the fourth decade of life.

**Cancer of the Stomach and Bowels** is more difficult to diagnose early, since the tumour is not visible, nor, at first, palpable. For this reason, after reaching the cancer age, a most careful look-out must be kept. Loss of weight and a diminution of strength are early signs, especially if accompanied by "indigestion". While these are by no means diagnostic of cancer, yet they are indications that something is wrong, and it is a matter of prudence and commonsense to investigate them. Severe constipation of recent date, stomach-ache, and alternating bouts of constipation and diarrhœa are very suspicious symptoms. There are many people who are suffering from what they fondly imagine to be "piles" and who anoint themselves nightly with unguents which might as usefully be applied to their hair, who are in reality victims of cancer of the rectum. The ostrich burying its head in the sand in order to hide from its pursuers is laughable; but the human being who from any reason—or want of one—is averse from a medical examination to discover the cause of rectal pain or bleeding, deserves pity and incarceration

in an asylum. It is invariably better to be safe than sorry. The only way to diagnose intestinal cancer may be by an exploratory operation, but at the present day this is a procedure which does not entail danger to life.

If the public would save itself from this scourge, it must be taught not only to recognize the signs of early cancer and to act upon them, but also to overcome its unreasonable fear of the modern operating theatre. That fear is based upon ignorance, and upon the fact that too many operations are deferred until it is too late and the surgeon is often practically compelled to operate against his better judgement upon a body already sapped by disease. The public can protect itself against cancer if it will but listen. If to warnings it turns a deaf ear, then nothing can be done; its blood must be upon its own head.

As for the prevention of cancer, it will be already sufficiently clear that the first essential is the avoidance of local and chronic irritation. Sir Arbuthnot Lane has truly said: "Cancer does not attack a healthy organ." In women the breast must be protected from the pressure of badly designed and ill-fitting corsets. The period of suckling must not be too long continued; absolute cleanliness of the nipples is

essential; and any inflammatory condition must be carefully treated.

Cancer of the womb usually occurs in those who have borne children; but the maternal instinct will always swamp the fear of malignant disease. Neither celibacy nor contraception can be utilized as methods for the prevention of uterine cancer. Child-birth causes normally a certain amount of damage to the womb, and it is most important that those who attend accouchements should exercise great patience and take diligent care that no avoidable damage should be done to the birth passages on account either of haste or the unnecessary use of instruments. The damaged area may become the seat of chronic inflammation which may eventually lead to cancer. The chronic inflammation may exhibit itself as a discharge; this in turn causes irritation, and so a vicious circle is established.

Cleanliness of the mouth is the surest prophylactic measure against cancer of that cavity. Daily brushing of the teeth, and the removal from between them of particles of food after every meal, are needful. The teeth themselves should be examined periodically by a dentist. In those whose age is over forty, all decayed teeth and rough stumps should be extracted. The irritation of a broken tooth

upon the tongue is often the genesis of cancer. The man who is at, or past, middle life, and who finds that smoking, drinking alcohol, or taking condiments or hot foods causes a soreness or tenderness of the mouth or tongue, will be doing a most prudent thing if he gives up these luxuries.

Alimentary indiscretion is the stimulus to cancer of the lower digestive tract. A daily evacuation of the bowels is the surest protection against intestinal irritation. This is largely a matter of habit, and the training should be begun in childhood. If a child is taught to do two things—to say its prayers before bed and to open its bowels after breakfast, it will certainly be laying a firm foundation for both moral character and physical health.

The real cause of cancer still remains to be discovered ; and no practical purpose would be served in this book by a discussion of the numerous theories relating to it. Our present purpose has been to indicate certain facts of real practical importance. If heed be given to these, then cancer is robbed of most of its terror. The main thing for the public to lay firm hold of is the fact that *early cancer is most certainly curable by early surgical operation, which operation is trivial and not dangerous to life.*

Until cancer in all its aspects has been completely stripped of its mysteries, then other methods, however helpful they may be, are but auxiliaries to surgical treatment, and their main applicability is to those cases in which operation has been too long delayed. There is undoubtedly much more in heaven and earth than exists between the covers of a pharmacopœia. Lord Dawson of Penn has truly said that " when the nature of the disease has been determined . . . there are several branches of knowledge ancillary to medicine which can usefully operate on their own lines, with a general guidance from medicine. There is a place for the gifted fingers of the bonesetter and osteopath, for the delicate touch of the masseur, for the spiritual aid of the healer and the Christian Scientist, and for the highly-skilled operator with rays. To all in their proper sphere, welcome". But the proper sphere of all these things is not in early cancer. If there be a time for the application of such measures, it is when cancer is in its inoperable stage. It is unbusinesslike, immoral, against all human reason and spiritual experience, to throw away substance for shadow, to relinquish a certainty for a hope. The time that is wasted waiting for the hope to materialize is the time when surgical methods can, and do, cure.

There is no real antagonism between orthodox surgical methods and mental healing; each has its place, each can help the other. It is only when absurd claims are made by the surgical or spiritual fanatic that the unfortunate patient falls between two stools. The time in which the surgeon can do good is terribly short. Let him exercise his skill then to the full. All the other methods can be applied at the same time, but do not bar out the surgeon in early cancer, while admitting the Christian Scientist, the radium expert, and the spiritual healer. If the surgeon fails, no harm will have been done, no time will have been wasted, no regrets will remain. In a matter so sacred as human life there is no place for fanaticism or narrow-mindedness.

## CHAPTER IV

# TUBERCULOSIS

TUBERCULOSIS is an infective disease caused by the *Bacillus tuberculosis.* It is characterized by the formation of nodules or tubercles, roundish masses of tubercular tissue consisting of cells of a peculiar character which are produced in large numbers owing to the activities of the tubercle bacilli. In course of time the tubercles may become transformed into cheesy masses; they may become hardened or calcified, or may finally ulcerate.

Tuberculosis is one of the commonest diseases which affect the members of the animal kingdom. In fishes and other cold-blooded animals, probably owing to the temperature not being very favourable to the survival of the bacillus, tuberculosis is extremely rare. It has, however, been found among reptiles living in a state of captivity. It is a common disease of fowls, although there are then certain well-defined differences

between it and the form which attacks mammals. Dogs, cats, and sheep are seldom affected, but several cases are on record in which pet animals have been infected by their tubercular owners. From this it will be seen how necessary it is that dogs and cats should not be allowed near tubercular patients, because there is a very real danger of these animals transferring the disease to some other human being. In their free state monkeys and apes do not suffer from tuberculosis, but in zoological collections the tubercle bacillus takes a heavy toll of these creatures. Among cattle tuberculosis is of frequent occurrence. From the human standpoint this is of great importance, because it is from these animals that the milk and meat used as human food are largely obtained.*

Considered geographically, the disease is universal; but it is most common in the temperate zone. Its incidence decreases with the height above sea-level. Certain races seem to be especially susceptible to the ravages of the tubercle bacillus. Coloured people are extremely liable to a severe and devastating

* For a full discussion of tuberculosis in the lower animals as related to man, see the volume by Dr. Thomas Cameron in this series, called *Diseases of Animals in Relation to Man*.

form of pulmonary infection. Among whites, the Irish appear to be greatly predisposed to tuberculosis, while the Jews are comparatively immune. It has been thought that the latter owe their immunity to the oily nature of their food, and that they may have acquired a resistance on account of having been city-dwellers for 2,000 years.

Tuberculosis attacks more particularly that part of the population which lives in large cities. The conditions which conduce to this will be discussed presently. The crude death-rate from all forms of tuberculosis, per million living in England and Wales in 1924, was 1,058. The corresponding figure for cancer in the same year was 1,297, and for syphilis was 1,584. There are estimated to be 420,000 people suffering from tuberculosis in England and Wales at the present moment.

By one of the most masterly researches in human history, Robert Koch, in 1882, demonstrated the microbic cause of tuberculosis The bacilli are present in all tuberculous lesions, and they occur in greatest numbers in actively growing tubercles. In the more chronic conditions the numbers are fewer. When any tubercular area communicates with the blood- or lymph-streams, by these channels the bacilli may be disseminated throughout the body.

The most important form of tuberculosis from a public health aspect is that which affects the lungs: pulmonary tuberculosis or "consumption". In such cases billions of tubercle bacilli are coughed up daily into the surrounding atmosphere. The danger from the sputum of consumptives is, clearly, enormous. When the sputum containing the bacteria is allowed to dry, it becomes dust. It is then spread far and wide, making infectious everything upon which it alights. It has been found that the dust from the walls of a room which has been occupied by a consumptive is highly infectious for six weeks after the removal of the patient.

Infection may take place in several ways, but heredity is not one of them. It has already been pointed out that no microbic disease can, in the true sense, be hereditary; so that to use the term "hereditary tuberculosis" not only shows ignorance of biology and loose thinking, but is a stumbling-block in the way of the conquest of the disease. Tuberculosis may be congenital, the child may be born with it, but this is due to *contagion* when within the mother's womb, which is an entirely different thing from the disease's being hereditary.

What can be, and often is inherited, is a *predisposition* to the disease. Those who inherit a predisposition are just so constituted

that they exhibit a lack of resistance to the assaults of the bacillus tuberculosis. Provided they are not brought into contact with that germ, then they will remain healthy. If, however, they are attacked by it, such people provide a suitable soil upon which it can flourish, and they will develop the disease from a small amount of infection that would leave unscathed a non-predisposed person. In what exactly this lack of resistance consists, is still in doubt, but there are two distinct types of person in whom there is undoubtedly a predisposition to tuberculosis.

These types have been well known for thousands of years. Hippocrates, the most celebrated physician of antiquity, who was born about 450 years before Christ, described them. The first type which is especially predisposed to pulmonary tuberculosis is those who are tall, with long and thin bones, an ovoid and narrow face, and large eyes with long lashes. The skin is fine, thin, and somewhat transparent. The chest is long, narrow, and flat, with depressed breast-bone. The shoulder-blades tend to stick out, somewhat resembling wings. The second type, in which the predisposition is to tuberculosis of the skin, glands, and other organs, is characterized by coarse features, the nose being broad and the lips thick. The skin

is thick and opaque. The figure is short and squat, and the individual has large and heavy bones.

Tuberculosis may be spread by inoculation. This is an extremely uncommon occurrence, but is occasionally found in those whose work entails the handling of dead bodies infected with tuberculosis, such as butchers, tanners, and hide-cleaners. Such persons occasionally develop a small nodule on a finger which, when microscopically examined, is found to contain tubercle bacilli. The disease in this case usually remains strictly local, and thus is comparatively easy to deal with.

The chief mode of infection is by *inhalation*. This is easily understood from what has just been said of the infectivity of dried tubercular sputum. The air which is *breathed out* is not infective; it contains no germs. The air which is *coughed out*, however, contains a multitude of particles of diseased lung tissue, swarming with the organisms of the disease which with each cough are sprayed into the air for a considerable distance around the patient. The sputum dries, and in the form of dust is the means by which tuberculosis becomes spread. In the vast majority of cases, the initial site of the disease is in some part of the respiratory passages. This is seen from the

notifications in England and Wales for 1924. Of pulmonary cases there were 62,537 notifications, and 19,436 non-pulmonary cases.

It is a remarkable fact that post-mortem examinations show a high proportion of lungs of people who have died from other maladies to have the signs of healed or of active tubercular lesions. The relationship of this to overcrowding is obvious. Very frequently, and especially in children, the bacilli lodge in the tonsils. This is the common cause of the condition of tubercular inflammation of the glands of the neck. From the tonsils it is, of course, an easy matter for the bacilli to reach the lungs.

Tubercular infection may also be swallowed. A remarkable thing with reference to the intestine has been demonstrated, namely that if Indian ink be injected into that canal, after a time some of it will be found to have made its way to the lungs. In a similar manner it has also been shown that when tubercle bacilli have been placed in the intestinal canal, they can pass through the wall of that tube without causing any damage and so reach the lungs. It therefore appears that in pulmonary tuberculosis the bacilli need not always be inhaled; they may be swallowed. In that case, the tubercle bacilli must be present in the food or

drink. There is not much danger to be apprehended from eating the flesh of tubercular animals. The inspection of cows and of meat is so carefully carried out by the Public Health Service that it is as rare as a tail on a guinea-pig for an infected animal to pass. And in any case, the process of cooking renders the meat sterile. The great food source of danger is milk.

Milk is a most valuable article of the human dietary. It contains a high degree of nourishment, principally fats, and it also possesses those vitamines which are so essential in food. The use of milk should on these accounts be encouraged; but the first requirement is that it should be absolutely pure. Unfortunately at the present time there is a great deal of dirty milk foisted upon the consumer, and much of it is infected with tubercle bacilli. This fluid is one in which the tubercle bacillus flourishes luxuriantly. The Public Health Authorities have certain statutory powers with regard to milk, but to put them into full effect is a matter of great difficulty. No matter how good a law may be, it requires enforcement; and unfortunately in many areas, principally in country districts, efficient control is wanting. The conservatism of the dairy-farmer is a very solid and substantial problem. Methods of

milking, milk-storage, and so on, which were good enough for his ancestors who fought at the Battle of Hastings, are too often good enough for him. The point is that they are not good enough for the public ; and the public must see to it that modern ideas of cleanliness, so far as infective germs are concerned, are adopted at the source of milk supply. The first principle is to establish a high standard of cleanliness and efficiency with regard to the animals, premises, sterilization, general equipment, and milking methods. Secondly, it is essential that there should be a rigid examination of the milk, the methods of its storage, and its condition when it passes over the counter into the consumer's hands. This is realized, and such methods are now in operation. The most hopeful sign is that there appears to be a real desire on the part of the majority of dairy-farmers to receive instruction in modern scientific methods.

There are certain well-defined conditions which favour tubercular infection. One has already been referred to—an inherited predisposition to the disease. Another most important factor is *environment*.

The great liability of city-dwellers to tuberculosis is almost entirely due to the physical surroundings amidst which they live. Human

beings, many of them tubercular, are brought into close contact with one another in their homes, in the workshops, in the "tubes", and in the trams. This proximity favours the transference of infection.

The greatest enemy of the tubercle bacillus is the sun; but in the cities man seems to have made every effort to avoid seeing that luminary; and he has been extraordinarily successful in his endeavour. Even in this twentieth century forests of chimneys are belching forth dense clouds of smoke into the atmosphere, forming an effective screen between the germ of tuberculosis and its destroyer. Hoping to heat our rooms, we merely warm our chimneys and pollute the outside air. When the sun would stream through the windows into our rooms, disinfecting them, the careful housewife, anxious for the preservation of the colours of her cheap wall-paper and her shoddy germ-infested carpets, draws down the blinds. In order to conceal from prying eyes the orgy of crime taking place in our houses during the daylight, we keep out the actinic rays of the sun by means of the imitation lace products of Nottingham. It would almost appear as if the greater part of civilized humanity were banded together in a Solemn League and Covenant for the Protection and Propagation

of the Tubercle Bacillus. Working conditions have a profound influence in the propagation and spread of tuberculosis, for dust, bad ventilation, long hours, drunkenness, all render the individual more vulnerable to the onslaught of the disease.

One of the most potent predisposing causes is catarrh of the respiratory passages. Such a condition is but too frequently the starting-point of tubercular disease. It admirably prepares the soil for the planting of the germ. It lowers the local resistance. Catarrh of the nose, tonsils, throat, and bronchi are usually thought of lightly, but they are the advance scouts of the army of Consumption. To become an active member of a Consumptive Sanatorium, the quickest and most certain method is to neglect a cold or a bronchitis. It is important to realize that those of us who live in cities dwell in an atmosphere of tubercle bacilli; they are ubiquitous; and any breach in the ramparts of our resistance will be seized on by the storming parties of the enemy. Syphilis, the greatest racial poison of the world, undoubtedly predisposes to pulmonary tuberculosis.

There are many types of tuberculosis, but only that type will be dealt with which is of greatest Public Health importance—that affecting the lungs—consumption. Although tuber-

culosis of the skin is common, and although tuberculosis of other organs slays its thousands, the victims of pulmonary tuberculosis are numbered in tens of thousands.

Tuberculosis is a notifiable disease; that is, the medical attendant who diagnoses the disease must intimate the fact to the Medical Officer of Health for the district in which the patient resides. The principle of notification is essential in dealing with any menace to the Public Health. It is impossible to frame measures for dealing with any problem until the nature of it is ascertained and the extent of it is delimited. So far as disease is concerned, this can only be done by notification. The gathering of intelligence about the enemy, his morale, his munitions, his strength, and the disposition of his forces, is necessary before the opposing commander can make adequate plans for the offensive.

The following figures for England and Wales are interesting as showing the notifications from 1921 to 1924:

| Year | Pulmonary | Non-Pulmonary | Total, all forms |
|---|---|---|---|
| 1921 | 62,479 | 16,643 | 79,122 |
| 1922 | 55,798 | 16,178 | 71,976 |
| 1923 | 60,586 | 19,273 | 79,859 |
| 1924 | 62,537 | 19,436 | 81,973 |

It will be seen that there were 1,951 more new notifications of pulmonary tuberculosis in 1924 than in 1923, whereas the increase in non-pulmonary tuberculosis in 1924 from the previous year was only 163. The increase in pulmonary tuberculosis is probably more apparent than real and is due to increasing skill in diagnosis, to the greater use by general practitioners of the microscopical examination of sputa, and to more perfect compliance with the regulations regarding notification sent out by the Ministry of Health.

The following table shows the number of deaths in England and Wales due to tuberculosis from 1921 to 1924:

| Year | Deaths from Pulmonary Tuberculosis | | | Deaths from other forms of Tuberculosis | | |
|---|---|---|---|---|---|---|
| | Males | Females | Total | Males | Females | Total |
| 1921 | 18,121 | 15,384 | 33,505 | 4,778 | 4,295 | 9,173 |
| 1922 | 18,656 | 15,263 | 33,919 | 4,660 | 4,198 | 8,858 |
| 1923 | 17,571 | 14,526 | 32,097 | 3,514 | 4,177 | 8,691 |
| 1924 | 17,970 | 14,720 | 32,690 | 4,380 | 4,033 | 8,413 |

The increase in the number of deaths from pulmonary tuberculosis, both in males and in females, would appear to be due, in some

measure at least, to the poverty and underfeeding associated with unemployment. It has been found that in certain areas where unemployment is acute, the death-rate from pulmonary tuberculosis rises. A similar state of affairs is seen where housing conditions are bad.

The Tuberculosis Scheme in England is carried out by 360 Tuberculosis Officers who are highly trained specialists in this most important work. There are 460 residential institutions for the treatment of this disease, giving a bed-accommodation for 20,750 patients. On April 1st 1925 there were, occupying those beds, 12,163 adults and 5,104 children, giving a total of 17,267 actually under institutional treatment.

Pulmonary tuberculosis, phthisis, or consumption, is the most important form of the disease, so that this form will now be briefly described.

There are two main types: the acute and the chronic. In the affected lung itself, two varieties can be distinguished according to the mode of infection. If the infection has been by the inhalation of tubercle bacilli, the disease affects a large part of the lung, a lobe, or perhaps the whole organ. When, on the other hand, the bacilli are carried to the lungs by the

blood- or lymph-streams, the tubercles are not in one large area, but are scattered here and there throughout the tissue of the organ.

The acute tuberculosis of the lungs is what is popularly known as "galloping consumption", and men are more frequently attacked than women. The disease commences suddenly with a chill, often in a healthy individual who may or may not have been exposed to cold. The temperature rapidly rises; there is cough and pain in the chest. The case in every way resembles one of ordinary pneumonia, but about the seventh day, instead of a crisis occurring, the patient becomes very much worse. The temperature swings up and down, sweating occurs, the pulse becomes very rapid, the cough increases, and the sputum is now of a green colour and, when examined, tubercle bacilli are found in it. Unless the spit is so examined, it may not be realized that the case is not one of pneumonia but of tuberculosis. Death may occur within two weeks but usually within three months. Occasionally the acute symptoms subside, and the disease becomes chronic.

The great majority of cases of pulmonary tuberculosis belong to the chronic type. The seat of the trouble is generally at the top of the lungs—the apices. The tubercles may increase

in size, soften, and ulcerate. In other cases, instead of softening, the tubercle may become hard and firm, which is really a process of healing. When ulceration takes place, a cavity is formed in the lung, and where there are several of these they may unite and form a large one.

In chronic tuberculosis of the lungs, the onset of the disease is, as a rule, a gradual one. Sometimes all that the patient complains of is a feeling of being "below par", of a general "seediness"; and, unless carefully sought for, any signs of lung trouble may be undiscovered. Among young girls and children the first signs may be those referred to the stomach, dyspepsia, and vomiting. Anæmia, weakness, palpitation, and a slight rise of temperature in the afternoon may be the first signals of consumption. Often the initial sign is a sharp bleeding from the lungs, the patient coughing up some bright red frothy blood. After that, the disease usually progresses very rapidly. The vast majority of cases, however, begin with an ordinary bronchitis—a neglected "cold". This is especially apt to occur in those who are liable to "catch colds readily", and who are the subjects of catarrh of the nose and throat.

Cough is one of the earliest signs of consumption, and is almost constantly present. It may

be so slight as scarcely to attract the attention of the patient, but as a rule it becomes more constant and insistent as time goes on. It may become so persistent as to cause vomiting, so that the patient may become very weak and emaciated. The sputum, in the early stage, is somewhat scanty and resembles grains of sago, but the characteristic appearance of tubercular disease is the presence of greyish little purulent masses. When there are cavities present, the sputum from these is coin-shaped circular flat masses which sink in water. The coughing up of blood is by no means uncommon, occurring in about 80 per cent. of cases.

Fever is a most important symptom, the temperature usually rising in the afternoon or early evening. Occasionally, however, extensive disease may be present which occasions no rise in temperature. One of the most distressing signs of consumption is severe and drenching perspiration occurring as a rule in the very early morning hours. The fever and the sweating combine to reduce the patient to a markedly emaciated state. In pulmonary tuberculosis the weighing machine gives the surest indication as to the progress of the disease.

There are five usual methods by which

consumption may end in death. It may first of all take place by a gradual failure of strength, the patient slowly and peacefully sinking into oblivion, retaining consciousness almost till the end. In cases of galloping consumption suffocation (asphyxia) may ring down the curtain. Death by syncope is not a common occurrence. Hæmorrhage ends life from the rupture of a blood-vessel in a cavity of the lung. The patient may bleed to death into his own lung, none of the blood being coughed up. In a few cases, death may be due to a tubercular inflammation of the coverings of the brain (meningitis).

The treatment of tuberculosis is a matter of supreme importance, and so is its prevention In discussing its causes we have realized how much can be done towards preventing it. Fresh air, good and sufficient food, sunshine, smoke-abatement, good housing, short hours, hygienic workshops, good wages, healthy recreations, are all needed. All this may seem Utopian, but it is not. It is but decent conditions under which to live human life. It is desired equally by the Communist and by the Capitalist. The amount of money spent by Great Britain alone in the manufacture of means wherewith to destroy human life during the Great War, would, properly handled, have

almost obliterated tuberculosis, and considerably reduced the incidence of venereal disease, cancer, and alcoholism.

Whatever other means may be adopted, the first principle in the treatment of tuberculosis is *open air*. There are not sufficient sanatoria to accommodate the tubercular population, so that of necessity the great majority of such patients have to be treated in their own homes. There are many difficulties in the way of doing this, but most of them can be surmounted by careful teaching and the use of a modicum of intelligence by the patient and his friends and relatives. The results, when commonsense is used, are extremely gratifying. There is, however, a great dread, especially among the middle classes of society, of sleeping out of doors. This, however, anyone can be trained to do; at least there is no real hardship in sleeping with the windows open. A tram ride through the industrial part of an English city will show, however, that the characteristics of the windows are that they are closed, are curtained, and in 90 per cent. of them the area left uncovered by curtains is occupied by an aspidistra. While there is any fever, the patient should be kept in bed; and unless the weather is extremely boisterous, the windows should be kept as wide open as possible. How-

ever, home treatment is but a poor substitute for that in a sanatorium.

There are four essentials for the success of sanatorium treatment:

(1) Cases must be sent to a sanatorium in the early stages of the disease;

(2) The patient must reside in the sanatorium for a sufficiently long period;

(3) The principles of sanatorium treatment and discipline must be thoroughly and intelligently applied;

(4) There must be proper after-care of patients when they have left the sanatorium.

Where all these are heeded, cases of pulmonary tuberculosis, even in the second stage where the disease is well established, show a survival rate of 56·8 per cent. of males and 67·4 of females at the end of five years.

It is important to realize that only in early cases can sanatorium treatment exert its full effect, and that it is perfectly hopeless to expect patients in an advanced condition to derive any benefit, much less cure, from it. Early diagnosis and early notification are the foundation-stones upon which recovery by open-air methods is based.

The benefits of residence in a sanatorium are evident after a very few weeks, and there is

a popular idea that a stay of a few months is sufficient to establish a cure. This is a very long way from the truth. Patients who have been admitted to such an institution must place themselves unreservedly in the hands of the Medical Superintendent as regards the length of their sojourn. To leave too early will inevitably result in a relapse; and generally speaking, the last condition of the patient is worse than the first, and he may then be an unsuitable case for such treatment. Furthermore, the time and money spent upon his institutional treatment in the first instance will have been thrown away.

For the patient who has to earn money to keep himself and his family there is undoubtedly a great incentive to curtail his sanatorium treatment as soon as he begins to feel well. It is difficult to see how this can be overcome in any way except by the State adequately providing for the dependents of the patient. Until this is done, until the mind of the consumptive is freed from financial anxiety as to his family, a high proportion of patients will leave the sanatorium with the disease not cured, but merely arrested. Soon after he returns to his environment and the labour which engendered the disease, the tuberculous process again flares up. The financial con-

dition of the patient does not allow him to leave his employment for a second time ; he " sticks it " till he can do so no longer, and by that time he has ceased to be suitable for sanatorium treatment. He dies at home, infecting many other people in the process.

In the poorer homes it is impossible to apply sanatorium principles correctly. The situation is bad, the rooms are small, adequate rest and nursing cannot be had, suitable food is often unobtainable—in short, it is an unequal struggle with the odds very much in favour of the tubercle bacillus.

So long, therefore, as patients leaving a sanatorium are forced to return to bad hygienic conditions, for just so long will sanatorium treatment fail and be largely a waste of money. The after-care of the consumptive is a most important problem, and its solution entails a great deal of expense. The institution of village settlements for such patients seems to be the only method. Several of these have already been started, suitable open-air employment being found for the patients. Their labour is graduated, is carefully supervised, and during it all they are under competent medical observation and control. Everything is so arranged that the patient should not only be able to hold his own against the disease, but

that he should be assisted to make some progress. In many instances such patients have to be trained to new occupations which will enable them to become money-earning members of the community without returning to their former unhealthy labour. It must be borne in mind, however, that training in a new occupation is of no value unless the patient can be assured of employment in that occupation. It has been found that there are great difficulties in this respect. In the absence of a specific treatment for tuberculosis, the plain fact is that the consumptive will be a high cost to the State. He must be kept, nursed, and controlled. Unless that is done, he simply becomes a moving disseminator of tuberculosis throughout the rest of the community. It is clear, then, that however expensive the Tuberculosis Scheme may be, it is money well invested. The hope of the future is that there may be placed in our hands some really curative measure.

Much has been written, thought, and spoken of the Spahlinger treatment. From what has been reported by competent investigators this treatment seems to be most hopeful. Financial conditions appear to have been acting adversely towards M. Spahlinger in his researches, handicapping him severely in the preparation of his

serum in anything like adequate quantities. One cannot help thinking that those who, perhaps from no personal effort, are in possession of much wealth, would obtain more satisfaction from financing a research of this nature than in unearthing the tombs of the long-dead Pharaohs or building airships with which to fly to the North Pole. This serum is to be tested by the Ministry of Health when enough of it is available.

Research has also been proceeding along the lines of injecting into the patient derivatives from fatty oils, such as that of the cod's liver. It is well known that the effect of taking cod liver oil is to build up the patient's resistance against the attacks of the tubercle bacillus. The work that has been done with a substance in cod liver oil, named sodium morrhuate, is already very encouraging. All that can be claimed at present is that, while no actual cure can be attributed to it, in most cases very marked improvement has resulted from its use.

In Copenhagen a good deal of work is being done with gold salts. The substance used has been termed " Sanocrysin ", and it is thought to have a specially destructive action upon tubercle bacilli. This salt is a very powerful one, and its use is not unattended with danger.

It can only be administered safely by an expert; and in view of the serious results which may happen, the patient, during the treatment, must be under careful medical observation.

There are certain conclusions now available as regards the treatment of tuberculosis with Dreyer's vaccine. The Medical Research Council have investigated this substance and have been unable to discover that it has any value in active consumption. It is not suitable for use in cases where there is fever; but it has been found helpful in the more chronic cases where it has been used in conjunction with sanatorium treatment. Taking it all in all, this method has not succeeded in raising one's hopes.

To summarize the position, one may say that a great deal of consumption can be prevented by care, and by eliminating bad hygienic conditions; that cure can be brought about by early diagnosis and sanatorium treatment, but that at present there is no curative remedy available. The urgent requirements are: money for village settlements and for the after-care of the consumptive, as well as funds for research work.

## CHAPTER V

# ALCOHOLISM

THIS scourge differs from the others in that it is, to a great extent, based upon the deliberate intention of the individual. In this instance there is no microbic cause—no bacillus of drinking. There is no infection or contagion about the matter. Alcoholism is simply the outward expression of a particular type of mentality.

To attribute alcoholism to *habit* is simply getting nowhere. It conveys no real information; it is a mere camouflage to mental laziness in seeking the cause. The important thing is to discover what engenders and perpetuates the custom of taking alcohol and the constant desire for it. The alcoholic person indulges in drink for exactly the same reasons that the drug addict sips his laudanum or snuffs his cocaine. He does it deliberately. He does it because he obtains a very certain, definite, and, to him, desirable result. Alcohol may increase his waist measurement, redden

his nose, make coarse his features, or give him cirrhosis of the liver; but he does not take it in order to acquire these physical adornments. He realizes that these things do not enhance his æsthetic value; he knows full well that alcoholic excesses will shorten his life, but that knowledge does not act as a deterrent. The pity of his friends, the contempt of his acquaintances, the shame of his relatives, do not count with him. To him there is something to be gained from alcohol which completely outweighs all these disadvantages. The drunkard realizes and thoroughly appreciates the fact that alcohol induces in him a certain condition for which his whole mental being craves. It is a means to a long-sought end; and to attain that end is the one compelling thing in the life of such a person. He is prepared to pursue it right up to the portal of Death, even if it costs physical health and material prosperity. This end has become a necessity for him, and he has discovered that the surest means by which he can reach it is by taking a sufficiency of alcohol. The drunkard and the martyr are shaped from the same raw mental material.

The vast majority of people who take alcohol are by no means "alcoholics". They feel no compulsion to drink. A glass of beer with lunch is no more alcoholism than a weekly

visit to church is religious mania. An ante-dinner cocktail is to many merely a custom in no way different from changing one's clothes for that meal. There are, on the other hand, certain individuals who take alcohol, not as a beverage, not from custom, but with a very definite object in view which has nothing whatever to do with habit or social intercourse. They take it as a drug, in overdoses.

The world in which we live reacts upon the consciousness of each of us in a different manner. Each human being is an instrument upon which the surroundings play. Some are more delicate than others, more easily put out of tune, more apt to produce discord. In some cases there has been a flaw in their manufacture; and, despite the most careful handling, it seems impossible to extract harmony from them. They cannot be attuned to the realities of life, they will not keep at its " concert pitch ".

To a certain extent this is true of us all. There are times when each of us craves for a temporary respite from our responsibilities, and so thrive the " cinema ", the fiction library, and the drama. The cotton merchant seeks forgetfulness from the vagaries of the market in watching a prize-fight; the surgeon may seek to evade the strain of the operating theatre in attending the Grand National. All of us find

relaxation in mixing socially with our fellow beings; and such relaxation is essential for mental health and efficiency. The fact is that a good dinner and a glass or two of wine for some people, a pint of beer and a discussion on the relative merits of "Manchester City" and "Manchester United" for others, constitute perfectly normal and blameless proceedings. The taking of a moderate amount of alcohol is a powerful factor in creating sociability, in saving sanity, and in protecting civilization from boredom.

But there are some natures so constituted that the external world of reality appears overwhelming and terrifying. The demands made upon their consciousness are too insistent for them to meet. They crave for some sanctuary from the jarrings and annoyances of life. These people have found, probably by accident in the first instance, that alcohol acts in a manner similar to an anæsthetic. It blunts their receptiveness; it protects the exposed and quivering sensibilities of their personality. Under its influence they can withdraw from the turmoil, recede into themselves, and live in a sphere where all their dreams come true. The monastic recluse possesses the same temperament. Fleeing from the World, the Flesh, and the Devil, the religious takes refuge behind the

monastery walls. He refuses to stand and fight, but shelters himself from the bitter blasts of life with the warm mantle of religion. Alcohol is the monastery of the hypersensitive materialist.

In alcohol does he find peace, quietness from the stress around him, an easy, cheap, and pleasant way of escape. Once he has found that road he will, whenever the need arises, again tread the same path ; and each succeeding time will be easier than the one before. It is his " Golden Road to Samarkand ". Eventually he gives up all effort to face the battle ; the line of least resistance lies invitingly open, and he gladly drifts along it. His indulgence saps his resisting power, and so a vicious circle becomes established.

What has been said of alcohol applies with equal force to other drugs such as opium and cocaine. That alcoholism has assumed the dimensions of a scourge is due to its cheapness, its strength, and the ease with which it can be obtained. Practically any person can purchase it in some form. It is very necessary to make a careful distinction between alcohol as a beverage and alcohol as a drug or poison.

A beverage may be defined as a pleasant, palatable, and refreshing drink which quenches the thirst and possesses no bad after-effects.

Certain preparations of alcohol taken in certain doses comply with this definition. But other preparations, or the same ones given in larger doses, have entirely different properties ; these assume the characteristics of poisons. Alcoholism then implies the use of alcoholic drinks of such strength or with such frequency that the effects secured are not those of a beverage but of a drug or poison. An individual may on occasion, either deliberately or accidentally, become drunk, but that does not constitute alcoholism. The alcoholic is he who deliberately and habitually takes overdoses of alcohol for the specific purpose of temporarily altering his mental outlook and escaping from the realities of life. While in this condition, actually under the influence of alcohol, he may not be " drunk " in the police-court sense of the term.

Alcohol, or to be more correct chemically, *ethyl* alcohol, is a colourless fluid possessing a pungent taste and a characteristic smell. It is this substance which confers upon fermented drinks their property of causing intoxication. In nature, alcohol occurs in certain vegetables and plants. It is produced by the fermentation of sugar. The plants which are most suitable for the production of alcohol are those which are rich in starch or sugar

In former times the strength of an alcoholic solution was roughly arrived at by pouring the fluid over some gunpowder and then setting fire to it. If the solution burned for a time, and only at the very end ignited the gunpowder, it was said to have " stood the proof " and was referred to as " *proof spirit* ". At the present day, however, proof spirit is a mixture of alcohol and water which contains 57·27 per cent. by volume and 49·5 per cent. by weight of alcohol. It has a specific gravity of 0·9186 (water being reckoned as 1). When a solution is *overproof*, it means that the amount of alcohol present is in excess of that in " proof spirit ". For example: spirit of wine has a specific gravity of 0·83 and is 54 " overproof ". It would therefore require to be diluted with 54 per cent. of water to reduce its strength to that of proof spirit. When whisky is said to be 35 under proof it means that 35 per cent. of alcohol would have to be added to it to bring it up to the strength of proof spirit.

Alcohol has a very strong attraction for water; and when the two are mixed heat is produced, and the volume of the mixture is less than the sum of the volumes of alcohol and of water used. This property of alcohol gives it one of its main characteristics as a poison. When it is taken internally, it extracts water

from the tissues, thereby causing damage to them.

Practically all over the world, and from the very earliest times, alcohol in some form has been used by human beings as a beverage or as a drug. In this country it is chiefly consumed as beer, whisky, brandy, gin, or wine. When taken fasting, alcohol has an immediate effect upon the stomach, causing a dilatation of the blood-vessels and a general congestion of the lining of that organ. It is absorbed from the stomach as alcohol; that is, it does not undergo any process of digestion. At first the rate of absorption is very rapid; but after a time, owing to its poisoning effect upon the absorptive cells of the stomach wall, absorption takes place more and more slowly. After it is absorbed, it quickly undergoes oxidation, during which process it liberates energy in the form of heat. The oxidation of 1 gramme of alcohol produces enough heat to raise the temperature of 1 kilogramme of water through 7 degrees centigrade. The energy value of alcohol is thus 7 calories per gramme. This is less than that of fat, but more than that of sugar. But between the oxidation of fats or sugars and that of alcohol there is a great difference. The former are usually oxidized completely; but even when this does not occur,

fats and sugars are stored up in certain organs and tissues of the body to be used when required. The amount of alcohol which can be completely oxidized is very limited—about 2 ounces in 24 hours—and it cannot be stored for future use. Its value, therefore, as a food and as a source of energy is very slight indeed.

The physiological effects of alcohol are definite and are very well known. It stimulates and quickens the heart, causing a dilatation of the blood-vessels, especially those of the skin. It thus engenders a general feeling of warmth and well-being. The blood is transferred from the internal organs to the surface of the body. On passing through the vessels of the skin, however, the blood is rapidly cooled by the outside air, so that the general temperature of the body falls very quickly. Alcohol thus acts like a drug upon the circulatory system, causing an evanescent stimulation which is rapidly succeeded by depression.

It is essential that the question of alcoholism should be studied and presented dispassionately and in a strictly scientific manner. Exaggeration does nothing but harm; but if one considers alcohol as alcohol and not as a beverage, there is no room for doubting that it is a powerful tissue-poison, and that if it is taken in large quantities over a prolonged period,

it inflicts damage upon the consumer. It is also true that the dose varies with the individual, as also does the time which must elapse before signs of damage appear. In suitable doses, however, it has a distinct value in bringing about a mental restfulness, in sounding a truce to the unending conflict between our personality and our environment, and in promoting that essential conviviality in social intercourse without which existence would scarcely be bearable.

Alcohol has, under certain conditions, a definite though small medicinal value. While it is not a true stimulant, there are certain bodily and mental conditions in which small doses have a distinct use. There are, of course, other drugs which exert a similar effect, but usually they are not immediately available, and they are not nearly so palatable. It is this palatability of some alcoholic drinks which constitutes a very real danger for many people. One's personal view is that, while admitting that alcohol is not a necessity to life, and that its toxic properties can be very great indeed, the modern world is better with it than without it, except in the case of those who are apparently unable to use it in any other way than as a poison. The moderate use of alcohol increases both the health and the happiness

of many people. In this chapter, however, we are not concerned so much with the praise of alcohol, as with the blame attaching to alcoholism.

The toxic effects are principally seen in the nervous system and in the mental sphere. The nervous system has been most aptly termed the *Master Tissue of the Body*. It is through this tissue that the intelligence manifests itself. The nervous system is the medium through which the personality expresses itself. It is the means by which the mind enters into intelligent relationship with the environment. Although one regards the intelligence as being something distinct from the brain, something entirely separate from and above a mere mass of nerve-cells, nevertheless it is only through nervous tissue that the personality of a living body can declare and develop itself. The action and reaction of the mind takes place through the senses.

The nervous system has, perforce, to be highly delicate and finely adjusted. As it has developed and become highly specialized during the evolution of man, so have the higher mental attributes been evolved from very elementary emotions. The rudimentary sex instinct which in the early dawn of the world was not even interpreted as being essential for the preserva-

tion and continuance of the race, has developed into the emotions of love, self-sacrifice, modesty, patriotism, courage, and indeed into all those things which serve to distinguish culture from brutishness. That instinct, wrongly developed or improperly controlled, may, however, lead to hatred, war, and murder. The higher psychical faculties are comparatively recent developments in the history of man. They are, even in this twentieth century, but lightly impressed upon the personality, while the more primitive instincts are graven deeply. The emotion of peaceful mother-love, as seen in the sweet-faced Madonna and child, is but derived from the lioness fighting savagely to protect her cubs, and transmuted through centuries of mental and moral progress. It is upon these raw elemental instincts that is built the wonderful, but far from completed, structure of human psychical development.

It is upon this delicate, nervous mechanism—the transmitter and interpreter of the intelligence, the custodian of all that raises man above the beasts—that the toxic effects of alcohol show themselves most clearly. Mental stability or normality is the balance between instinctive rudimentary tendencies and the forces which guide and control them. A certain dose of alcohol has the effect of in-

hibiting these higher and more recently developed controlling forces. The result is that the equilibrium is disturbed and the more primitive instincts come to the surface. There is thus an apparent mental stimulation. Properly interpreted, however, there has been no stimulation, but merely a lulling to sleep of control, a temporary removal of the veneer of culture and an exhibition of the coarser underlying material.

Acute alcoholic poisoning occurs where a large quantity of alcohol has been rapidly consumed. The amount of alcohol required to produce this condition varies with different individuals. One man may consume half a bottle of whisky and show no signs of drunkenness, while another may drink a small glass of port and be quite evidently inebriated. The first sign of intoxication or poisoning is an increased liveliness of manner. Self-consciousness disappears; the "dull dog" becomes brilliant in his conversation; the taciturn man becomes loquacious; the shy individual will insist upon favouring the company with one or more songs.

Soon the sense of proportion and the power of judgement go. Things are exaggerated, lying takes the place of truth, boasting replaces modesty. The appreciation of danger

is lessened, and there is a general lack of mental control. The guidance of muscular movements soon becomes impaired and is usually most noticeable in the staggering gait. The muscles of the tongue cannot be properly co-ordinated, and so the articulation becomes slurring and indistinct. The pronunciation of phrases such as "The British Constitution" becomes a matter of difficulty, if not of impossibility. The patient has a flushed, sometimes a bluish face. The pulse is full and the breathing deep. There is dilatation of the pupils, and the temperature is usually below normal. The intoxicated man gradually becomes sleepy and eventually loses all control of his limbs. The respirations become very slow and finally unconsciousness sets in. This latter, however, is rarely so deep that he cannot to some extent be roused. Sometimes the poisoning is so severe that the heart and the respiratory system become paralysed, and coma is followed by death.

In other cases stupor does not occur, but the patient passes into a very excitable state. He is unreasonably mirthful, or may give way to a fit of violent anger during which he may fight savagely with more than his usual strength. In this condition he may do himself or others serious bodily injury. This state is known as

alcoholic mania. It is succeeded by a period of profound depression, and death is apt to occur from sudden heart or respiratory failure. In a few cases the maniacal stage is closed by a convulsive seizure of a very violent character. This is rapidly followed by a series of others, each gradually becoming less severe until unconsciousness supervenes.

In some instances the drunken person becomes depressed from the commencement. This is especially so in women, who tend to become lachrymose.

A bout of acute intoxication is usually succeeded next morning by a state of alcoholic remorse in which good intentions of the usual fragile nature figure prominently.

Chronic alcoholism results from the taking of overdoses of alcohol for a prolonged period. The whole body becomes permeated with the drug, and so every organ and tissue becomes poisoned to a certain degree. The nervous system, the heart, the lungs, the liver, and the kidneys are the organs which suffer most ; but before them all the master tissue again bears the brunt of the attack. The mentality of the chronic alcoholic undergoes a profound alteration. In the early morning there is dullness, a wandering of the attention, irritability, forgetfulness, and a strong disinclination for

mental effort. This does not wear off until the patient is able to obtain another dose of alcohol. The moral character changes; dishonesty in small things occurs, the sense of truth becomes blunted, the will-power is weakened, and finally a condition of dementia may supervene. There is a particular triad of symptoms which is characteristic of chronic alcoholics: neuritis, forgetfulness, and erroneous ideas as to the patient's relationship to time and place. He is also prone to give quite imaginary and usually grossly exaggerated explanations of real occurrences.

Delirium tremens* occurs in chronic alcoholism. When a usually temperate person indulges in a bout of drinking, this condition rarely occurs. It seems to be specially reserved for the habitual steady toper who has an acute outburst of heavy drinking. In such persons, even in the absence of a "spree", delirium tremens may be brought on by an injury, a sudden fright, or by an acute illness such as pneumonia. The patient suffers from insomnia; he becomes very restless and depressed. Delirium sets in, the patient talking incessantly while his whole body is continually in motion. Visual and auditory hallucinations then develop. He sees snakes, lizards, reptiles of

* Delirium associated with muscular tremors.

all kinds, rats, and demons. He hears terrifying and threatening voices which may make the most revolting suggestions to him. During the whole of this time the muscles all over the body are in a state of twitching. The delusions may be so vivid and horrible that in order to escape from the zoological collection with which he is surrounded, the patient may attempt to commit suicide. After this restless stage has persisted for three or four days, the patient gradually becomes quiet and eventually falls asleep. On waking, the delusions are gone, but the tremor may persist for some time. In fatal cases the delirium does not abate, the temperature rises, there is severe prostration, and, with the gradual failure of the heart, the patient dies.

From the above description it will be seen that most of the symptoms are referable to a poisoning of the brain and nervous system. When the brain of a person who has died in delirium tremens is examined, there is found to be a severe degree of congestion of the membranes covering that organ (meningitis).

One of the most common symptoms of chronic alcoholism is gastric catarrh. The patient has a foul tongue and breath. In the morning there is a feeling of nausea, and vomiting may actually take place. There is usually

but little desire for food, and constipation is the rule. In persons who drink large quantities of beer, in addition to catarrh of the stomach there is generally a marked dilatation of that organ.

Alcohol has a very distinct and serious effect upon the liver; there is an abnormal increase in the amount of fibrous tissue, known as *cirrhosis of the liver.* Alcoholic cirrhosis of the liver attacks as a rule middle-aged men who have been heavy drinkers of spirits. The beer-drinker usually escapes. Cirrhosis of the liver is sometimes found in the children of alcoholic or syphilitic parents. A certain number of cases of cirrhosis of the liver are also associated with acute tuberculosis; but of all instances of cirrhosis, alcohol is the cause in an overwhelming proportion. Owing to the hindrance to the flow of blood through the liver, certain obstructive symptoms are present. There is congestion of the stomach with catarrh and vomiting. There is frequently bleeding both from the stomach and the bowels. Nose bleeding is not uncommon. The most striking sign of the venous obstruction is dropsy, in which fluid is effused into the abdominal cavity. On account of this, the abdomen may assume hyper-aldermanic proportions.

In the early stages, the liver may be enlarged

and tender. The patient is thin in the face; the eyes are hollow and watery. The complexion is muddy, and the cheeks show many distended small veins. Hæmorrhoids are common. In addition there are certain symptoms of poisoning, and chief among these are delirium, stupor, and convulsions—all referable to the nervous system. The outlook in any case of cirrhosis of the liver is very grave indeed, and this is especially so when dropsy is present.

In chronic alcoholism the heart and arteries show severe degenerative changes. The condition is known as *arterio-sclerosis* and consists of a thickening and hardening of the vessels. Their elasticity becomes lost. These changes eventually lead to faulty nutrition and degeneration of vital organs. One of the effects of arterio-sclerosis is to cause dilatation of the heart. The changes that take place in the kidneys are probably not directly due to the alcohol but to arterial damage; in any case, the end-results are serious.

It becomes necessary now to consider, briefly, some of the *physiological effects of alcohol* as distinguished from the pathological. A great many experiments have been made with the object of determining what value, if any, is possessed by alcohol as a food. A food may be defined as a substance which provides either

material or energy to the body. A food can be used to produce heat or muscular work, and it prevents loss of weight. Before alcohol can be regarded as a food it must be able to replace the other constituents of diet—proteins, carbohydrates, and fats. The values of these, as food, are estimated in heat-units or calories; thus one gramme of protein is equivalent to 4 calories, 1 gramme of carbohydrate to 4 calories, and 1 gramme of fat to 8·9 calories. It has already been seen that the caloric value of 1 gramme of alcohol is 7. The ordinary person requires about 3,000 calories a day, so that a diet of 100 grammes of protein, 500 grammes of carbohydrate, and 100 grammes of fat would be a sufficient diet, possessing 3,300 calories.

To a certain extent these foodstuffs are interchangeable, but there are certain limits. For example, only protein can replace the tissue wear and tear, for it alone contains nitrogen, so that if 3,000 calories are given as carbohydrate and fat with no protein, the body will lose nitrogen because it gets none from the food. If the carbohydrates be reduced below a certain amount, the body will use up its own proteins. A food must preserve the body-weight, and should cause neither loss nor gain of nitrogen. Alcohol contains no nitrogen and

it therefore cannot replace proteins. If it is a food, it must be able to replace to some extent carbohydrate and fat. Experiments have shown that the utilization of alcohol for the production of muscular work is wasteful, and is a cause of mechanical inefficiency. In short, alcohol has been proved to be quite inefficient from the point of view of a food, where either maximum muscular efforts or delicate muscular movements have to be made. On the other hand, in small doses it is beneficial from its mental effect, from its stimulation of the appetite, and from the fact that it decreases mental worry and promotes sleep.

In disease, alcohol can certainly claim to be a food, and a good one. It does not require to be digested and it is rapidly absorbed from the stomach. For a person confined to bed, 50 per cent. of the necessary food can be given (1,500 calories) in the form of alcohol; for example, 10 ounces of brandy in 24 hours. This amount, spaced out during the 16 waking hours, and suitably diluted, will not cause intoxication. In severe wasting fevers alcohol used in this fashion is invaluable.

Alcohol has a tendency to promote sleep, but has no real value in combating fatigue. Occasionally alcohol will for a time appear to drive tiredness away; but it is merely a

borrower of energy, and that has to be repaid later on in the form of a prolonged interval of rest when the effect is over.

So much for the individual. We must now consider alcohol and alcoholism as it affects the race. It is from this standpoint that a judgement must be arrived at, not only as to the position of alcohol, but as to the necessity for the control of its use and the treatment of those who are addicted to it.

It is probably no exaggeration to say that at least 80 per cent. of the male population of this country partake of small doses of alcohol. It is taken as a means of counteracting and getting rid of the unnatural selfishness and estrangement from his fellows which the individual acquires in his struggle for personal advancement and material gain. The saying is only too true: "There is no sentiment and no friendship in business"; and it is because of the inherent desire of man for sentiment and for friendship that when he discards his harness at the end of the day, he finds that a little alcohol again puts him *en rapport* with his fellows as a human being and not as a money-making machine. Even in business a certain amount of joy is essential to complete attainment; and there can be no doubt whatever that the moderate use of alcohol does conduce

to good-fellowship, harmony, and happiness, and that in so far as it does so, it must be regarded as of distinct advantage to the race. It is this which separates alcohol from such drugs as opium and cocaine. These are essentially selfish ; they separate the individual from the community ; like overdoses of alcohol, they are taken with the deliberate intention of secluding the individual from his fellows.

Most human beings are deeply concerned with the duration of life ; as a rule they are more interested in that than in the question of a future life after death. The advocates of total abstention from alcohol have repeatedly stated that not only does the taking of alcohol shorten human life, but that the key to longevity is abstinence. The whole question of alcohol and mortality has been statistically investigated by Professor Raymond Pearl, Professor of Biometry and Vital Statistics, School of Hygiene and Public Health, in the John Hopkins University of Baltimore. He finds that it is the moderate drinker rather than the total abstainer who has the advantage as regards increased expectation of life. Furthermore, it is a matter of common experience in medical and surgical practice that the teetotaller does not exhibit any marked superiority of physical health or mental activity

over his temperate brother. Indeed it would seem, when the matter is investigated dispassionately, that the key to longevity and good health is the sane and moderate use of alcohol.

During and since the Great War much work has been done upon certain nervous diseases which were in great part due to that orgy of bloody insanity. These have been investigated by the late Sir Frederick Mott, Pathologist to the London County Council's Asylums. He found that a large proportion of patients suffering from " disordered action of the heart " and from " shell shock " were total abstainers. The explanation is not, of course, that total abstinence is the cause of these diseases, but that such persons have an inherent faulty nervous and mental constitution, and that abstinence from alcohol is an instinctive effort at self-preservation. There can be no doubt that exactly the same thing makes the drunkard as makes the teetotaller. In 50 per cent. of such total-abstaining psycho-neurotic patients there was a history of drunkenness in the parents and grandparents. It all depends upon a peculiar temperament ; and when its equilibrium is upset, either inebriety or teetotal fanaticism may result. When religion is concerned, exactly the same thing is seen—there may be produced a Torquemada or a blasphe-

mous atheist. One's conclusion is that there is not and never has been the slightest evidence to support the oft-made assertion that the moderate use of alcohol is evil, that it causes ill-health and moral deterioration; but that, on the contrary, it has been productive of much mental rest, enjoyment, happiness, and good-fellowship, and that it is conducive to a healthy life and a bright mental outlook.

At the same time the excessive use of alcohol is undoubtedly a cause of much disease and crime. But it must be borne in mind that alcohol is only one link in the chain of causes and effects that produce alcoholism. The first of these is *example*. Whether or not a man feels thirsty, if his mates are quaffing mugs of beer, he does likewise. It may be an absurd thing to do under most circumstances, although it is based upon the herd-instinct. When one sheep jumps, the others do so too. It is an instinct that may be modified, guided, and controlled, but will never be eradicated. It is something essentially beneficial to the herd, but it can pour like a torrent along dangerous channels. It is the call of the tribe which, in time of war, makes men throw down their tools and enter the recruiting station. It accounts for a great proportion of church attendances—and for absences. It is the

cause of "bobbed" heads, braided dress trousers, fish knives, and much of the head-baring when passing the Cenotaph. It is on the whole useful; but can be detrimental. So far as alcohol is concerned, the herd—especially the foremost portion—realize that drunkenness is contemptible and is a thing arousing shame when one is sober. But still in certain sections of the herd, especially in those whose occupations bring them into the way of taking alcohol many times a day, example is undoubtedly stronger than precept. A glance at the mortality tables for alcoholism will show that cab-drivers, porters, seamen, labourers, hawkers, and publicans have the highest death-rates.

Another cause of drunkenness is the popular and, one might almost say, therefore erroneous, idea that alcohol is of value in enabling one to undertake and to continue doing heavy muscular work. The average navvy is honestly and firmly convinced that he works better by continually refreshing himself with pints of beer. No doubt by doing so he is more satisfied with himself and with his work, but his boss knows that both the quantity and the quality of the work deteriorate.

Social conditions which are unsatisfactory are an incentive to drunkenness. An over-

crowded, dirty home in a slum, the continuous noise of fretful children, badly cooked and insufficient food, a tired, overworked, bedraggled and consequently ill-tempered wife, will send many a man to the public-house with the deliberate intention of drugging himself into a temporary forgetfulness. And in these days when beer alone will not give him that solace quickly enough, he may lace his tankard with a dash or two of methylated spirits. All these causes just quoted are remediable; but the next cause is much more difficult to deal with.

It is when the fault lies in the nervous make-up of the individual, when there is a flaw which has rendered him all along incapable of reacting in a normal fashion to his surroundings. He wishes to forget his real environment, and he therefore drinks. But when he does so, the alcohol at the same time weakens whatever higher faculties he possesses, and it is these which enable the normal person to adjust himself to reality with some comfort. The more he indulges in alcohol, therefore, the less able is he to attune himself to life.

Such a one, born with a nervous flaw, is a congenital inebriate. If alcohol is available he will inevitably become a drunkard; if alcohol is abolished, his nervous defect will remain. He is degenerate, and in the absence

of alcohol that degeneration will express itself in some other manner.

When alcohol is available, this class of people gradually eliminates itself. The chronic alcoholic becomes unable to reproduce; in time he becomes sterile. It is interesting and important in this connection to consider the results of certain breeding experiments* with reference to alcohol. These have been carried on for more than twelve years; and the conclusion from these investigations is that during three generations the descendants of alcoholic great-great-grandparents show a constant eradication of defectives, and that the final group consist of very strong and healthy individuals. All the unfit have been weeded out. If one surveys the genus man, one sees the same thing in human history. Those peoples which have an alcoholic history are the strong races of to-day—mentally, morally, and physically. In these there has been the consistent elimination by alcohol of the unfit. The principal effect of the total prohibition of alcohol is to encourage the perpetuation of an inherently degenerate stock, the degeneration becoming more marked as time goes on.

One's view is that alcohol has a definite and valuable place in human life, but that it must

* Guinea-pigs were the animals used.

be kept strictly to its proper uses. When it oversteps its bounds, then indeed it is a scourge —but a minor one. How is it to be controlled ?

If no alcohol were made, then, of course, alcoholism could not exist. But the causes of alcoholism, the innate instability of certain individuals, would remain, and there would in succeeding generations be a higher proportion of such. In the prohibitionist United States of America there is a distinct national neurosis expressing itself in more insanity, more violent crime, and in certain peculiarities in art, literature, the drama, and religion. It has even been asserted that in the United States there are now more deaths from alcohol and more chronic alcoholism than there were before the adoption of prohibition, which has become a greater scourge than alcoholism and much more expensive.

No legislative methods will cure alcoholism. It is impossible to make people sane by Act of Parliament. The whole problem is a psychological one, and it must so be tackled. Until it is realized that the important part of the individual is not the physical but the mental, which controls and conditions the physical, then all attempts at the solution of this, and many other problems, will be futile. But apart from that, there are certain things which can

be done towards preventing the abuse of alcohol. The effect of public opinion has already been seen. It is, at the present day, an unheard of thing for men invariably to seek their couches in a state of drunkenness; and yet, almost within living memory, for a man to go to bed sober was for him to be considered a milksop. Education, wider interests, a higher appreciation of the arts, a more accurate conception of the value and the objects of human existence have wrought these changes. Commencing in that class so much despised by the Communist—the Bourgeoisie, these views have spread both up and down, and the time will eventually come when the whole mass will be leavened.

But drunkenness, apart from alcoholism, is more apt for several reasons to affect the industrial classes. The provision of places for the consumption of alcohol only, is often very inferior. The public-house in the slums is merely a drinking-den; it is, as a rule, a malodorous dungeon into which a man would not care to bring his family. It is tucked away, very often, down some side street; it is furtive and secret. Comfort is conspicuous by its absence; clients are expected to stand at the bar and to drink quickly and often. The man who takes half an hour to drink his half-pint

in quiet conversation with his friend is not too popular. He occupies too much time and too much room for his investment of fourpence halfpenny. Again, the quality of the liquor served, especially the spirits, is often bad. One of the most dangerous things is to go to a bar and order "whisky", without specifying a brand, for something may be dispensed bearing that name which is much more of a poison than a beverage.

The strength of alcoholic drinks could very well be reduced considerably, and at the same time the characteristic flavour be maintained. Long before an individual shows signs of intoxication he should be full of fluid. Where concentration of alcohol is desired, it should be so expensive as to place it in the category of a luxury.

By a sane appreciation of the matter, by realizing that the use of alcohol is beneficial to mankind in increasing the sum of human happiness and making life more worth living, one in no way denies that when alcohol is taken to excess it is a very evil thing and that its effects are disastrous individually and collectively. There has been too little sanity shown about this question; and there can be no doubt that much harm has been done to the cause of real temperance by the "teetotal"

and prohibition fanatic who possesses exactly the same nervous instability that produces the inebriate.

The temperance reformer should concentrate upon those remediable causes of drunkenness, bad housing and so on. He should endeavour to raise the standard of alcoholic beverages and also that of the places in which they are drunk. By the careful and tactful guidance of public opinion, drunkenness has become a recognized instance of bad manners, and the intoxicated person is rightly regarded as a public nuisance. On occasion he can be a public danger ; and it is the soundest of good sense to punish with imprisonment the drunken driver of a motor-car.

For the chronic alcoholic there are certain lines of treatment that occasionally prove effective. Most certainly he should be confined in an institution or home of some kind so that he will be continually under observation and control, and where every effort will be made to build up his moral character again. Hypnosis has been of great value. One thing seems certain and that is that such an individual should not be allowed to breed. There is everything to be said for the sterilization of the incurable alcoholic and the incurable criminal.

## CHAPTER VI

## CONCLUSION

THE preceding chapters have dealt individually with the four great scourges of to-day ; it is now time to consider the relationships between them, how one reacts upon the other.

From the very earliest times a close affinity has been recognized between Bacchus and Venus. Experience has shown that now, as ever, alcohol plays no inconsiderable part as a cause of venereal disease. As has already been explained, one of the early effects of alcohol is to paralyse the higher faculties and to release the more primitive instincts. The most powerful is that of sex. Undoubtedly the effect of alcohol is, in the majority of cases, to give an impulse to the sexual instinct. The individual loses his moral control, his power of critical judgement is weakened, and his sense of caution becomes more or less obliterated. Through his alcoholic eyes the painted harlot —from whom, were he sober, he would recoil

—now seems to him a creature of infinite attraction. Such a man does not exercise any care in the selection of his partner ; all that he is concerned with is that she is able and willing to gratify this instinct which is driving him.

This is well recognized by those who constitute the oldest profession. Those of them who are no longer in the first rank of beauty obtain their clients principally from among the intoxicated. They know that such a man is not going to be too particular ; all he wants is a woman. Where drunkenness is rife, there congregate the lowest and most highly infected prostitutes. The ground upon which venereal disease and prostitution flourish best is one that has been well treated with alcohol.

A certain proportion of men infected with venereal disease do, no doubt, invoke alcohol merely as an excuse of some kind to account for their moral lapse after the fashion of the murderer who pleads, " I did not mean to kill him ; I was drunk at the time." But making allowance for all that, there is no doubt whatever that drunkenness is a very frequent cause of men utilizing the services of prostitutes.

Drunkenness, as a rule, causes the sexual act to be prolonged, and thus the liability of venereal infection is increased. Furthermore, whatever knowledge the man when sober may

possess as to the means of prevention, is all forgotten under the influence of drink. He takes no precautions to avoid venereal infection; indeed, when he recovers from his "spree", he may have no recollection whatever as to what happened during it. He may therefore after a time be greatly surprised, and perhaps somewhat indignant, to find himself suffering from syphilis or gonorrhœa.

Drunkenness and sexuality are closely associated. The greater the amount of drunkenness, the greater is the amount of venereal disease. The drunken man is the special quarry of the lowest, most drunken, and therefore the most infected class of prostitute.

It is quite common to find that two men—one drunk and one sober—have exposed themselves to venereal infection with the same woman within, say, an hour of each other, and that while the sober man escapes, his alcoholic companion acquires infection. The explanation of at least some of these cases is that alcohol causes a lowering of the threshold of resistance to syphilis and gonorrhœa.

A man who is already the possessor of a venereal disease and who becomes intoxicated, is also tempted to sexual irregularities. He has lost his appreciation of right and wrong, and has no hesitation in indulging his desires.

By this, of course, he is doing his very best to spread the disease. When syphilis or gonorrhœa has become established in a patient, the taking of alcohol is harmful. To a well-marked degree, it nullifies the effect of treatment.

The onset of pulmonary tuberculosis is, in many instances, due to an alcoholic debauch. The initial rise of temperature and feeling of well-being are quickly succeeded by a prolonged period of depression. The body temperature is lowered, and in the open air, perhaps in most inclement weather, the intoxicated person contracts a chill. Pneumonia and pleurisy commonly result. The resistance of the lungs to disease is, in consequence, markedly lowered; and these are just the conditions which enable the ubiquitous bacillus tuberculosis to establish itself in the pulmonary tissues, where, in due time, it will manifest itself as consumption. To the consumptive, alcohol in small carefully regulated doses may be of great value; but overdoses will undoubtedly have but one effect—that of reducing his fighting power. The disease will then progress by leaps and bounds. Drunkenness is one of the surest and most pleasant methods by which the consumptive can commit suicide.

Chronic alcoholism has a real influence in the causation of cancer of the digestive tract. It

sets up a continued irritation of the stomach and intestines, in the form of a catarrh, and, as has been seen, such irritation is a potent factor in the production of malignant disease.

Cancer and tuberculosis may, by creating despair in the mind of the sufferer, drive him to seek forgetfulness or consolation in alcohol. If he takes enough he will achieve his object, but at the same time he will stimulate the disease and hasten his demise.

Syphilis undoubtedly predisposes to tuberculosis of the lungs. The virus of this disease is so powerful a tissue poison that no portion of the body escapes its influence; and post-mortem examinations have shown that the lungs are very frequently involved in cases where, during life, there was no suspicion of anything of the kind. The lungs of the syphilitic are "damaged goods", and form an admirable soil for the tubercle bacillus.

Tuberculosis of the skin may be the starting-point of cancer; and, as has already been indicated, syphilis of the tongue frequently is the forerunner of malignant disease of that organ.

These Four Horsemen are all riding for the same stable, the owner of which is Death. The first three especially constitute serious menaces both to the individual and to the race; and

as has been shown, alcoholism is a cause powerfully predisposing to the other scourges, although it is not in itself remarkable as a killer.

The solution of the problem of drunkenness is largely a political one; that of alcoholism is entirely a psychological one. It would appear that the first thing which is required is a sane outlook, for "teetotalism" has been erected into almost a religion so far as an anti-anything can really be so. The total abolition of alcohol is unnecessary, undesirable, impossible. Nay more, even if such a thing were brought to pass, the underlying cause of alcoholism would not only remain but would be strengthened.

Venereal Disease, Cancer, and Tuberculosis are all unnecessary diseases. They are all curable; they can all be diagnosed definitely, and at an early stage. Vast sums of money are being expended upon their treatment; but the trouble is that in spite of all the noise which is being made, little is being done as regards prevention. There is a great deal of mediævalism still about not only among the laity but among the medical profession. Much more attention is given to diagnosis and treatment than to prevention. One will find general agreement with the truism "Prevention is

better than cure", but the real position is that at present it is impossible to cure the majority of cases of cancer and tuberculosis. They are seen too late. The overwhelming proportion of such cases could be prevented by giving heed to certain warnings which have been referred to in the foregoing chapters. The few cases which even then might occur, could most certainly be cured were they but diagnosed sufficiently early.

The venereal diseases could be almost entirely eliminated from our midst within a few years. Everything is known about them which is necessary for their complete control and eradication. Still, little is being done, except soothsaying.

What one would suggest as required is a greater element of compulsion, and that must come as a well-expressed desire from the public. When the magnitude of these scourges is realized, the public will demand that the legislature and the medical profession deal with them on a businesslike footing.

The means of preventing venereal disease, cancer, and tuberculosis are well known. Every politician knows that bad housing, for example, is a cause of consumption, and yet one sees nothing but mental inertia. The very people who are most affected by the disease

are fettered by trades union rules which prevent their laying more than a certain number of bricks per day, and are bound to prevent others laying any more. Much money is spent in taking consumptives from the slums, housing them in admirable and expensive sanatoria, and then when they are cured, sending them back to their hovels again.

During the war, certain people by very simple and commonsense methods were able practically to eradicate venereal disease from among the troops with which they had to deal. These methods can be applied equally well in civil life; and yet every attempt to do so is received with hostility from certain members of the general community, of the clergy, and of the medical profession. A large amount of the money spent in providing treatment for venereal patients is wasted because there is no power given to compel patients to continue attending till they are cured.

The prevention of cancer largely lies in the hands of the people themselves; but they must be taught. Fortunately this is now being done.

Education is what is wanted all along the line. The medical profession itself must widen its outlook. It must concentrate not exclusively upon the individual. The general practitioner must cultivate more of the Public

Health spirit of prevention. The training of the medical student must be more concentrated upon essentials; and venereal disease, cancer, and tuberculosis are more essential, more special separate subjects and of more public importance than Insanity, Ophthalmology, and Diseases of the Skin. The practitioner must be willing and anxious to avail himself of the services of the expert, for no one man to-day can be competent in all the branches of the healing art.

The public must take an interest in its own health, not only individually but collectively. The community must cease to pin its faith to bottles of medicine or boxes of pills. It must realize that man is essentially a healthy animal, and that most disease is man-made—due to carelessness, selfishness, and ignorance. It must demand from its medical advisers nothing less than the best, and be content with nothing less.

Like the poor, the fool and the charlatan are always with us, both among the general public and among what are humorously termed the "learned professions". The former must be cured of his folly, if possible, or, at the very least, measures taken to prevent its causing trouble to his fellows. The charlatan among healers is by no means unknown. On the

Medical Register there are herbalists, osteopaths, and qualified medical men who are also charlatans, but happily they are comparatively few. The herbalist who " cures " syphilis with sarsaparilla, the bone-setter who breaks down a tubercular joint, the doctor who treats a lump in the breast of a woman of forty with poultices and who does not send her to see a surgeon—all are charlatans and knaves, and merit punishment.

Because a thing or a line of treatment is unorthodox, is not in itself proof of its wrongness ; and it is just as ridiculous and dangerous for the public to fly to unorthodox methods simply because they are new or well advertised as it is for the medical man to condemn these things for the same reasons. Antiseptic surgery and hypnotism were once sneered at by the leaders of the medical profession. Doubtless hypnotism was exploited by charlatans.

The public can rest assured that the truth will prevail ; they can be certain that in dealing with these scourges, orthodox medicine and surgery are not asleep but that much research is being done, and that every new method *from whatever source* is being patiently investigated and tested by trained and highly scientific brains.

It has been the endeavour in this little book

to focus public attention upon these scourges of to-day, and to point out their public importance. They are all conquerable. All that is required is a little patience, a sense of duty, some commonsense, and a considerable amount of determination. The appreciation of the importance of these matters and the problems arising from them is a necessary part of citizenship, it is a patriotic duty, and, above all, it is the essence of that service which each individual owes to his fellows.