The tobacco habit: its history and pathology : a study in birth-rates. Smokers compared with non-smokers.

KHARTOUM,

SHIRBURN ROAD,

TORQUAY.

Dear Sir,

I beg you to accept a copy of my book, "The Tobacco Habit." I hope the importance of the subject, both in the Home and in the Empire, will induce you to consider the impartial evidence which I have collected from widely different sources, and which has not yet been disproved. I may truly say that both medical and scientific books declare that tobacco-smoking causes many diseases, therefore I wonder that so many learned men in the professions of Divinity, Law and Medicine are to be found among the ranks of habitual smokers. Such examples are a stumbling-block to those with less learning, who naturally look to those in the higher walks of life for guidance.

I beg to call your attention to my attempt to give a clear and comprehensive definition of Temperance (page 9), as I feel it is necessary for those who are wishful to promote this virtue to be ready to mention the actual habits which are to be avoided, so that men may learn how to lead "godly, righteous, and sober lives," and so help the Church to be militant, and, finally, triumphant.

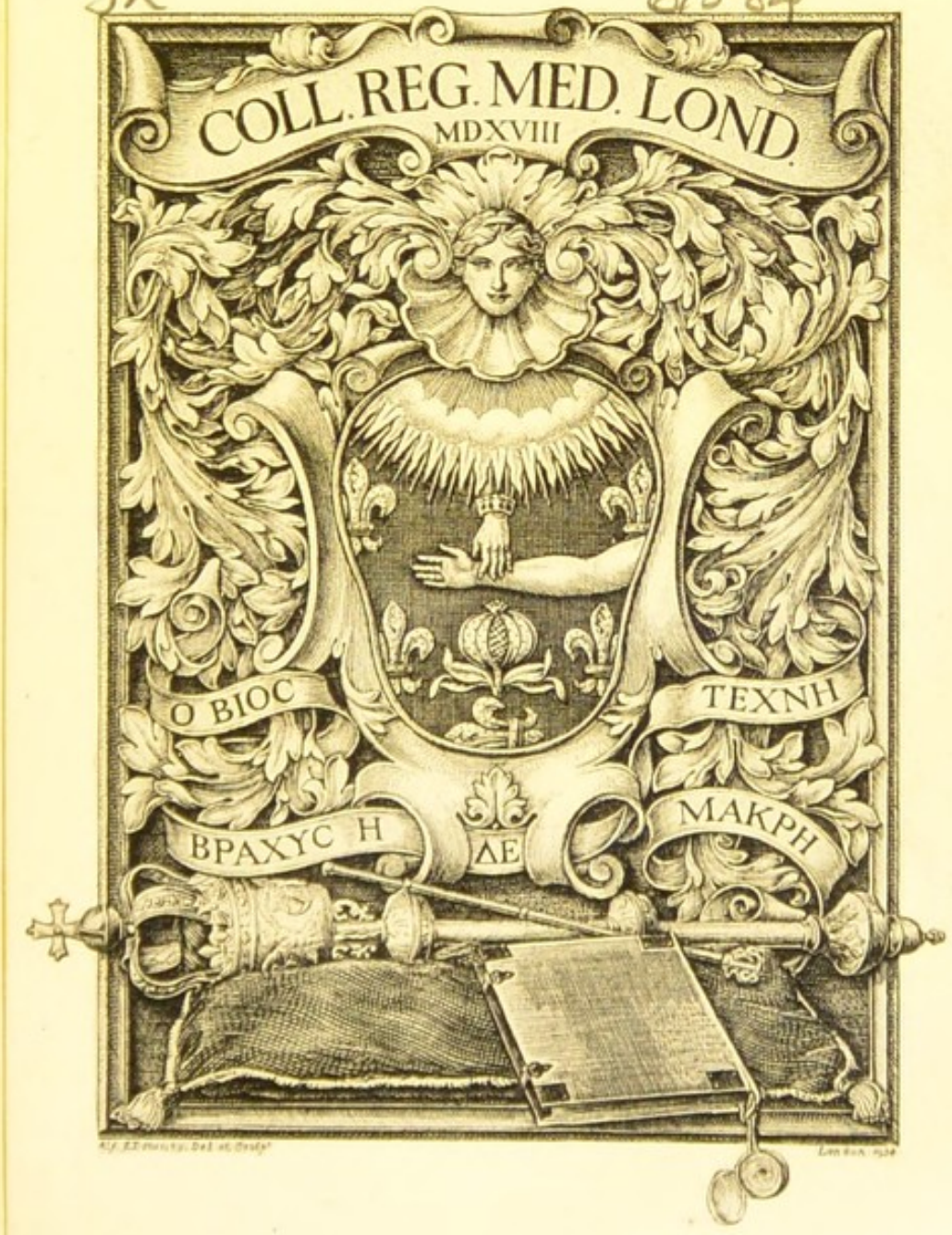
I quite realise that it will be at least unpleasant to attack the tobacco habit, but when men realise that tobacco has been a false friend, and a veritable wolf in sheep's clothing, they will learn to respect those who are trying to save them from the wolf.

The book may be had from any bookseller, price 3/6 net.

Yours faithfully,

H. H. TIDSWELL.

With the author's
compliments



THE TOBACCO HABIT.

THE TOBACCO HABIT

ITS HISTORY AND PATHOLOGY

A STUDY IN BIRTH-RATES. SMOKERS COMPARED WITH NON-SMOKERS

BY

HERBERT H. TIDSWELL

MEMBER OF THE ROYAL COLLEGE OF SURGEONS, ENGLAND;
LICENTIATE OF THE ROYAL COLLEGE OF PHYSICIANS, LONDON;
LATE HOUSE-SURGEON TO ST. GEORGE'S HOSPITAL
AND NORTHAMPTON INFIRMARY

An Appeal to Medical Students and all Members of the Medical Profession who are true Christians and zealous in promoting true Hygiene and Temperance

LONDON
J. & A. CHURCHILL
7 GREAT MARLBOROUGH STREET
1912

DEDICATION

In Loving Memory of

A GOOD FATHER AND A GOOD MOTHER,

To whom I am indebted, under Divine Providence, for all my spiritual and temporal blessings. To my Mother's wisdom and moral courage I owe my emancipation from the slavery of the Tobacco Habit, which I unhappily acquired in the Medical School of St. George's Hospital, London.

Consider the words of the Prophet Jeremiah:

"Is there no physician there? Why then is not the health of the daughter of My people recovered?"

—*Jeremiah* viii. *22.*

PREFACE

The Author's aim is to call attention to the ill effects of Tobacco on all the functions of the body, but chiefly on those of the generative functions. The causes of sterility, abortion, still-birth, and other diseases of pregnancy are dealt with in detail. The causes of the falling birth-rates are discussed briefly, in simple language, so as to be intelligible to any educated person.

H. H. T.

KHARTOUM,
TORQUAY.

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CHAPTER I.

An Appeal to Medical Students and all Members of the Medical Profession who are true Christians, and zealous in the cause of Hygiene.

Brother Chips and Fellow-Labourers,

Let us consider for what purpose God has provided and trained a large body of medical practitioners? Why has He imparted to us knowledge and wisdom to relieve suffering, to prolong life, and even to stamp out or prevent the spread of many terrible diseases which once devastated our land?

I think God's purpose is that we should fulfil the work that Christ commenced, that is, the work of regenerating degenerate mankind. In order that we may fulfil our divine mission, God has bestowed upon us His Divine Spirit. His gifts of skill and wisdom are given now to His faithful ministers in answer to prayer, as in the days of the early Church.

God is the giver of wisdom and knowledge through the indwelling of the Holy Spirit. The art of healing the sick and relieving suffering is truly a divine gift, and we should consider ourselves highly honoured by God and the King, who rules by divine right, when we are admitted as members of the medical profession.

It is necessary that we should be loyal to our spiritual Head, Christ the Saviour; we must glorify His name and be faithful witnesses for Him. We are ministers of Christ in the same degree as the bishops, clergy, and other ministers of the Gospel, but we do not wish to exalt our office above theirs. Our work is only partly spiritual, their work is, or should be, entirely spiritual. We are

obliged to serve the needs of the body, but we do our work in a Christian spirit, knowing that the body of a Christian is a temple for the indwelling of the Holy Spirit.

Let each medical student and practitioner ask himself these questions: What is my purpose in life? Who comes first in all my thoughts in my daily work? God or self? Man's duty is to place God first, because man is the son of God. "For as many as are led by the Spirit of God, these are sons of God" (*Romans* viii. 14).

St. Paul was the greatest thinker and the clearest teacher that God has raised, and he wrote these trenchant and elevating words: "For we are labourers together with God: ye are God's husbandry, ye are God's building. . . . Know ye not that ye are the temple of God, and that the Spirit of God dwelleth in you? If any man defile the temple of God, him shall God destroy; for the temple of God is holy, which temple ye are" (1 *Corinthians* iii. 9, 16, 17). It is obvious that St. Paul taught that the body of a Christian is holy and must not be abused. We, therefore, who profess to be Christian medical men, must not forget the high position we occupy as fellow-workers with God. But if we make the mistake of placing our own glorification as the chief purpose of life, and forget to honour God as we should, then our work will be in vain, for God will not bless us. We are specially called upon to be living witnesses for Christ, and to lead "godly, righteous, and sober lives."

How is it we have nearly all gone astray in our student days, and commenced our professional lives under false ideals? The two words "curriculum" and "examination" are the ruling factors in the life of a modern medical student. I spent my first two winters of the medical course in the unsavoury atmosphere of the dissecting room, in which smoking was permitted after one o'clock. Such is the usual environment of the medical student in his early days. Picture the scene, once so familiar! There is a table containing a corpse, with students commencing their dissections; at other tables separate limbs are being dissected. In the morning the demonstrator is always giving instruction, in the afternoon the scene is different. There is general conversation going on among some groups, and demonstrations among others. The results of football matches and

examinations are keenly discussed. In this way our higher instincts are blunted, and we acquire the smoking habit as we learn our anatomy. So we are handicapped in the beginning of our profession, for we retain a "blind spot" in all our future study. That "blind spot" for the evil of narcotism is responsible for the ruin of many men, not only in our profession but in all ranks of life, from the duke to the peasant. If you will pause and consider your responsibility, and sieze your opportunity for getting right with God and your neighbour, take your Bible and read through the first chapter of the prophet Isaiah.

I have tried to describe the true relation of a Christian medical man to the Divine Master, the Great Physician. I will now try to explain the duty of a medical man to the King who rules over our Empire.

The medical profession of the United Kingdom consists of an amalgamation of rival Corporations and Colleges, which can give degrees and diplomas. But, strange to say, there is no chief medical officer to speak with authority in the name of the whole profession. On reference to the Book of Common Prayer of the Church of England, I find the following: Article XXXVII.—"*Of the Civil Magistrates.* The King's Majesty hath the chief power in this Realm of England, and other his Dominions, unto whom the chief Government of all Estates of this Realm, whether they be Ecclesiastical or Civil, in all causes doth appertain, and is not, nor aught to be, subject to any foreign jurisdiction." We may regard our King as the head of the whole profession. Does he not trust to our honour and intelligence, as legally qualified and registered practitioners, to be faithful and diligent teachers of the laws of health in his realms and dominions?

May I offer my brother practitioners a simple rule for their guidance amidst the perplexities of this modern life. In all questions remember that our first duty is to the Great Physician of souls, the Christ; our second duty is to our King and Country; our third duty is towards our patients and ourselves. The whole object of our medical training is to acquire a sound knowledge of the laws of health, that we may help men and women and children to avoid sickness and disease. The regeneration of humanity from moral, mental, and physical disorder is our appointed task. Our helper will be the Great Physician, who is able

to supply us with power and wisdom to fulfil his work. Our mission is to teach the gospel of hygiene.

I may claim to have some experience of the effects of tobacco smoking on the human body, having studied the subject in all its bearings for over thirty-eight years. I commenced my medical studies in 1873 at St. George's Hospital Medical School. The habit of smoking tobacco was prevalent among the students, and I had the misfortune to follow the multitude in that respect. I learnt to smoke, and soon I experienced the slavery and fascination of narcotism. I did not give myself up to idleness or pleasure, but I found the habit a serious hindrance in the strenuous life which I had determined to follow. At length I discovered my health was beginning to suffer, and that I must break myself of the habit at all costs. The result was satisfactory; I soon recovered my health and then I began to warn others of the injurious effects of tobacco. It may be truly described as suicide or self-destruction by easy instalments.

Can such a habit be defended by the members of the learned professions, divinity, law, and medicine? The members of these professions have been specially educated to act as preachers, judges, and medical advisers respectively. Consequently their habits, actions, and words are closely observed and copied by the less learned people. When learned men stoop to folly, it is not surprising that the unlearned follow their example. It is my desire to induce the members of the learned professions to inquire whether they are doing their duty in allowing themselves to indulge in the use of a narcotic (which tobacco is) which has been condemned by wise and good men on religious and scientific grounds. I urge all who wish to enjoy health of mind and body to abstain from all narcotics, as tobacco, opium, cocaine, etc., and from the abuse of alcohol.

The highest aim of medical men is to study the causes of diseases, in the hope of discovering some means for their prevention. We cannot hope to treat any disease successfully until we understand its cause and nature. We are told that property has its responsibility, so also has the possession of expert knowledge. Medical men are trusted as honourable men to warn their patients against all injurious articles of food and drink. Surely

also they should always be prepared to pronounce a verdict as to the use or non-use of tobacco. Unless it can be proved that the habitual use of tobacco for mere sensual gratification is essential to the health, and cannot possibly injure the user, or his wife, or his offspring, we should withhold our consent. That is surely a safe position to assume. A medical man is watched by many observing people, because he is looked upon as possessing special knowledge on health matters. His words and actions carry weight. Will he show a true light or a false one? Will he guide the ignorant to avoid tobacco, or will he encourage them in a habit which may lead to disease and death?

Our profession has done and is still doing a noble work in educating the nation as to the dangers of excessive indulgence in alcoholic beverages. I trust I may persuade my brethren to study the diseases caused by the abuse of tobacco, with equal diligence and impartiality. We must then give the public the benefit of our knowledge. If you come to the conclusion that it engenders moral, mental, or physical degeneration, you will no doubt be true to the best traditions of medicine and protest on all sides, until you succeed in educating public opinion against the habit. I hope every man will do his best to warn innocent boys against cigarettes. The promotion of health and the prevention of disease is a work worthy of Prophets, Priests, and Kings.

Owing to the recent advances in medical science, the writings of authors of the last generation are seldom consulted, and are little known to the present generation. When I first began to search for medical opinions on the effects of tobacco, I was referred to *The Lancet* for 1857 (Vol. I.), and I was surprised to read the number of letters written on the subject. The writers engaged in that controversy were not men of one school of thought, but men who had seen practice in all parts of the world, and who had the interests of the human race at heart. Surely it is time for a revival of the Tobacco Controversy. These letters prove that many members of the medical profession of the last generation were fully aware of the diseases caused by tobacco, and endeavoured to check the evil by warning the public.

Many of the writers were men of mark and position in

their day, and their opinions deserve the attention of all earnest students and practitioners. Every generation must learn from the experience of former ones. Though science advances, the human body remains the same sensitive organism through all ages, re-acting to external influences in a similar manner. Nature changes not. As in the beginning, so is nature now. The customs of men may change, but if these are contrary to the laws of nature, they will be attended with evil consequences. The civilised inhabitants of Great Britain, Europe, and America have indulged in the use of tobacco for over three hundred years.

It is high time to enquire if the result of this modern habit is good or bad ? Surely wise men will not continue a habit of such a costly nature if they are convinced that it is injurious.

I cannot regard tobacco as food. No one pretends to classify it under that heading. It is not drink, therefore it seems reasonable to classify it as a medicine or a drug. Therefore, I enquire why healthy men require to take medicine habitually ? From my own experience I am prepared to state that under no circumstances is there any advantage in this country from the smoking or chewing of tobacco. I am also firmly persuaded that the majority of intelligent physicians are of the same opinion. No writer on anatomy has yet described a structure or organ in the human body specially created for burning tobacco. It is certainly an abuse of the respiratory passages to apply them to burning tobocco for the purpose of inhaling the smoke so produced. No writer on physiology or therapeutics has even ventured to suggest that any functions of the human body would be better performed under the influence of a narcotic drug. There is no room for doubt as to the harmful nature of tobacco when smoked, chewed, or used as snuff. Therefore, we cannot plead any excuse for such indulgence by ourselves or our patients. Every offence against the laws of the Creator invariably meets with some form of suffering or death. Illness often results from imperfect chemical changes (metabolism) in the digestive organs as the result of tobacco toxæmia.

When a man commences a bad and unnatural habit, he injures not only his own nature, but the natures of those who are dependent on him. The wives and children are

made partakers of the husband's moral, mental, and physical sufferings and diseases. The husband is the head of the wife, both spiritually and socially, and when he dishonours himself, he dishonours his wife, because they have been made "one flesh," so that they re-act on each other—when the man rejoices, the wife rejoices; when the man is gloomy, the woman is gloomy; when the man is honoured, the wife is honoured. There is a proverb that "birds of a feather flock together," and it seems to apply to men who smoke, for they seem to flock together and to forsake the society of the gentler sex. Smokers congregate in clubs, public houses, cafés, at race meetings, football matches, etc., forsaking the partners of their joys and sorrows. Consequently the single and married women do not enjoy their due share of the society of the stronger and more selfish sex. The men have made a poor exchange, if they have forfeited the love and respect of womankind for the comfort and suffering associated with indulgence in narcotism. Is it possible that the tobacco weed has prevented the healing of the nations under the regenerating power of the Holy Spirit? We are living in a Christian country, and we boast of our civilisation, but we groan beneath a burden of unrest, discontent, hysteria, and insanity. We cry aloud to one another for relief, and want to be restored to health, and we appeal to our legislators to find a cure for the ills that afflict us. I have come to the conclusion that we have inflicted these ills on ourselves by disregarding the laws of the Creator, who is the lord of our health, and who has appointed physicians for the express purpose of teaching people how to preserve health. More than fifty years ago a plain and strong warning was published in the leading medical journal called *The Lancet*, describing the diseases caused by tobacco smoking. Since then the medical profession has carried on an active crusade against the drink curse. In spite of these warnings the drink bill for the United Kingdom reaches the fabulous sum of £160,000,000 each year; while the annual bill for tobacco and smokers' sundries, is over £25,000,000 a year.

The nation is now groaning under self-bought and self-afflicted plagues which torment them day and night, and from which they see no way of escape. I venture to say that there is a way of escape, and I hope that the

medical professson will undertake to proclaim the same truth. I maintain that the way to restore health and wealth is to teach the people to live temperately and to work together in a spirit of brotherly love to promote national health and prosperity. Our aim as medical men should be to purify the homes of England, so that every home may be a sanatorium and a model dwelling-house. We are responsible for the health of 45,000,000 people, including 6,000,000 children in our elementary schools. We must interest ourselves more in guarding these children from the evil effects of cramming. It would be wise to begin with the children, for they need our help most, and we may hope to win over the parents to our principles by showing our love to their children. When they see we are working for the good of their children, we may ultimately gain the confidence of the parents and lead them to be temperate.

Hygiene is a very wide subject, including the teaching of discipline, self-control, and temperance. We need a clear and precise definition of temperance that will be helpful to teachers in all classes of society. As medical men, we must not be bigoted or fanatical, but we must not suggest compromises with conscience or truth. We cannot go so far as to declare that moderate use of alcoholic beverages is harmful in all cases, therefore we cannot declare they are poisonous and therefore unlawful. We may feel sure that the safer course is to adopt total abstinence as a general rule, both for physiological and financial reasons, but we should not promote the interests of the nation by advocating extreme measures. The case of tobacco smoking is on a different footing. Custom in this country has so far limited the indulgence to the men, but now we are threatened with smoking women. We also have seen, with regret, the growth of the habit among boys under ten years of age.

We have now the advantage of an Act of Parliament to prevent smoking under sixteen years of age. This is not a preventive, but it is a sign that the conscience of the nation can be stirred, and it must be the aim of the whole medical profession never to let the national conscience have ease until the habit of using tobacco becomes a stigma and a disgrace. We dare not give any encouragement to the continued indulgence in any drug

habit, and we regard the smoking habit as a form of narcophilia,* which may soon develop into narcomania.

I will now give my definition of temperance for the guidance of medical reformers and others. Temperance should stand for: moderation in efforts at education and in all forms of school work and study; moderation in eating and drinking, especially the use of tea and alcoholic beverages; finally it should stand for total abstinence from all things which are not lawful, such as tobacco and other narcotic and stimulant drugs. One of the evils which afflict the children of our land is intemperate education.

Our first duty will be to study the etiology of all diseases, and for this purpose we must visit the homes of our patients frequently, and keep in touch with them all the year round. After a few years experience one will know the constitution of each patient, and in time the practitioner will learn how many diseases are preventable. Each season brings its own dangers. Since the advent of the hot weather I have seen two boys suffering from chill, the result of bathing too long in the sea, and one girl with acute congestion of the liver from exposure to the sun. The basis of etiology is:

(1) A knowledge of the stimulants and narcotics our patients indulge in.

(2) A knowledge of the school-masters' methods of forcing the brains of children.

(3) A knowledge of the school environment.

(4) A knowledge of the home environment.

(5) A knowledge of the sports indulged in.

(6) A knowledge of the occupations of adults.

(7) A knowledge of the food and water, and sanitary state of the home and the workshop.

(8) A knowledge of the religious environment, whether normal, abnormal, or nil.

The first essential for a practitioner to become a skilful etiologist is an earnest desire to search for truth, and never to be in a hurry. Every clinical fact should be written down at the time, in fact the note-book should always be

* Narcophilia = loving narcotism — idleness — dreaming.

in the hands ready to take down the sayings of the patient or his friends. The value of such a plan will become obvious to the reader, when he peruses my series of family histories of the non-smokers and smokers on genealogical lines. I venture to state that this method of taking histories will throw more light on the cause of the declining birth-rate than the haphazard method now adopted of collecting statistics of births, deaths and marriages. The utility of the Annual Reports of the Registrar General is seriously diminished, and the value of all statistics is uncertain, owing to the want of a definite nomenclature.

We all admit the defects in our Public Health Service; in some directions there is over-lapping of official departments, and in other directions there is under-lapping. All these State officials are useful, but we could spare them better than the under-paid and over-worked army of general practitioners; they still constitute the first line of defence against disease in its earliest stage. If they will become experts in etiology, and teach the value of temperance, they may deliver the Empire from the evils which threaten to destroy her existence. It is important to ascertain the nature and extent of diseases which are inherited, and then to enquire whether the parents were addicted to the use of tobacco, to state the exact amount smoked each week, and the age when the habit commenced.

When there are a number of skilful etiologists in the profession, an effort should be made to induce the Government to take a census of the United Kingdom, by a staff consisting of medical men who have become specialists in etiology. By this means much valuable and correct information would be acquired as to the direct or indirect causes of tubercule, cancer, insanity, arterial degeneration, chorea, hay-fever, myopia, congenital defects of mind, etc. True progress must be slow at first, for we have to deal with vested interests and British prejudice, and pride and ignorance. But these will yield in due time if we faint not.

I am confident that if the members of the three learned professions will abandon those habits which hinder their own spiritual and temporal progress, and that of the nation, and adopt habits of temperance, and work in a spirit of brotherly love, teaching the blessings that may be confidently anticipated from national tem-

perance, there will be a rapid decrease in the records of crime, disease, insanity, destitution and suicide.

I appeal to the members of the three learned professions to form a society for promoting health and temperance in the homes of our Empire. Union gives strength. If you still doubt the need for temperance reform, read the newspapers and note how many Christians in name have become victims of sin and disease through alcohol and tobacco. If you will not become an active reformer, please pray for a blessing on my book.

Consider the words of St. Paul, which were addressed to the Christian converts who were living in Rome: "I beseech you therefore, brethren, by the mercies of God, to present your bodies a living sacrifice, holy, acceptable unto God, which is your reasonable service. And be not fashioned according to this world: but be transformed by the renewing of your mind, that ye may prove what is the good and acceptable and perfect will of God" (*Romans* xii. 1, 2).

CHAPTER II.

The History and Antiquity of the Tobacco Habit.

Gilbert Burnett, F.L.S., in his "Outlines of Botany," published 1835, writes, "There are about thirty species of nicotiana, and some of these are natives or naturalized in most parts of the world; for, although its use was unknown in Europe before the discovery of America, indulgence in its use is so common, nay universal, among the Chinese, and their forms of bamboo pipes and their methods of inhaling so peculiar, that Pallas and many others have been led to believe that the custom is aboriginal with them, and that they and other nations of the East were acquainted with its use before its introduction into the West. Two or more species, *N. Sinensis* and *N. Fructicasa*, are also believed to be natives of China, and *N. Nepaulensis*, of Hindustan. Chardin states that its use was common in Persia, long before the discovery of America, and that it is a native of that country, or at least was naturalized there as early as 1260. The origin of the word tobacco is doubtful. Like coffee and Peruvian bark, tobacco encountered violent opposition when its half-inebriating and soothing properties recommended it to popular use.

"Many governments attempted to restrain its consumption by penal edicts. The Sultan Amurath IV. forbade its importation into Turkey, and condemned to death those found guilty of smoking, from a fear that it produced barrenness. The Grand Duke of Moscow prohibited its entrance into his dominions under pain of the knout for the first offence, and death for the next; and in other parts of Russia the practice of smoking was denounced,

and all smokers condemned to have their noses cut off. The Shah of Persia and other sovereigns were equally severe in their enactments; and Pope Urban VIII. anathematized all those who smoked in churches. In 1654 the Council of one of the Swiss cantons cited all smokers before them; every innkeeper was ordered to inform against all those who were found smoking in their houses. But not only legislators, but philosophers, entered into a crusade against tobacco."

King James I. had a strong dislike of smoking, and wrote a book to condemn its use. Here follows an extract from his famous "Counterblaste," "Surely smoke becomes a kitchen, far better than a dining chamber, and yet it makes a kitchen oftentimes in the inward parts of men, soyling and infecting them with an unctuous and oyly kind of soote as hath been found in some great tobacco takers, that after their death were opened."

The smoking of tobacco has been practised in China, Hindostan, Burmah, and other countries of the East from time immemorial. I do not know whether the powerful nations of Assyria and Persia indulged in the habit, but I am not aware of any evidence being at hand from cylinders or stone carvings. How far it has kept back and helped to degrade different races in days of old, we shall never know. In later times when the Greeks and Romans raised their Empires, and cultivated the arts and sciences, they accomplished their grand work without the aid of tobacco. Chivalry, bravery, and religion flourished in England before the introduction of tobacco. It is worth while considering the manner in which the habit of smoking was introduced into this country.

The tobacco plant is not a native of this country, and was not introduced till the time of Queen Elizabeth. Sir Walter Ralegh acquired the habit of smoking tobacco from the natives of North America. He brought the weed to England, and it appears that he recommended it as a remedy for dyspepsia; whether he described it as a panacea for other aches and pains I do not know. Probably he pushed it with all the assurance of a man who wished to derive a good income from it. He laid himself out to obtain a monopoly for its sale, and cultivated it on all his Irish estates. So we learn that people began to smoke tobacco at the advice and on the responsibility of a brave

adventurer and a gay courtier, who had obtained a powerfully poisonous drug that was much used by some of the ignorant savages of North America. The medical profession was in no way responsible for its introduction; it rapidly became a fashionable habit in the court of Queen Elizabeth, and we are told that even the ladies were enticed to draw the fumes into their mouths. At Sir Walter's house at Islington he frequently entertained his guests, the only refreshments he offered them being a mug of ale with nutmeg, and a pipe of tobacco. Ralegh became a victim to the charms of Lady Nicotine, and worshipped her to the day of his death. He was ambitious to accumulate wealth, and he turned his attention to the Liquor Trade, and secured from Queen Elizabeth a valuable patent of the monoply of licensing taverns, and retailing wines throughout all England. Thus he combined the business of growing tobacco and retailing wine. However, in the next reign he became mixed up with plots against his lawful sovereign King James and was committed to the Tower. While a prisoner he attempted his life. He enjoyed the society of many learned men who were fellow prisoners. He was the favourite of Queen Elizabeth and was a man of great influence at her court. His misfortunes commenced in the court of King James. His later days were full to the brim of sorrow, sickness, and misfortune. When the morning of his execution came, he awaited his fate with calm, christian fortitude. He poised the axe, felt its edge, and then said with a smile, "This is a sharp medicine, but it will cure all diseases." His estates were forfeited, and his widow left broken-hearted and penniless. Such was the unhappy end of the man who was responsible for starting the habit of smoking in England.

It is interesting to learn from the writings of Camden, the famous historian, what his opinions were on tobacco smoking. Speaking of the return of the first Colonists from Virginia in 1586, he writes thus: "These men that were thus brought back, were the first that, I know of, that brought into England, that Indian plant which they call tobacco and nicotia, which they used against crudities,*

*Crudities = an obsolete term applied to undigested substances in the stomach.

being taught it by the Indians. Certainly from that time forward it began to grow into great request, and to be sold at a high rate, whilst in a short time, many men, everywhere, some for wantonness, some for health sake, with an unsatiable desire and greediness, sucked in the stinking smoke thereof, through an earthen pipe, which presently they blew out again at their nostrils, insomuch that tobacco shops are now as ordinary as taverns and tap-houses."

From a fair and temperate consideration of the origin of the smoking habit in the time of "good Queen Bess," it is evident that the spirit of scientific inquiry as to the real action and effect of tobacco was absent. Extravagant statements as to the valuable properties of tobacco for the relief of indigestion, probably helped to make it popular. It is also stated that it was considered a cure for syphilis by the American Indians, and that the Spanish sailors who returned to Spain with Columbus, infected with this disease, thoroughly believed it was the only cure for the malady.

The new habit met with considerable opposition from King James I. He published a strong letter to his people pointing out the poisonous properties of tobacco, and calling attention to the numerous diseases resulting therefrom. His warning did not cause the smokers to abandon the habit.

In the year 1615 the Vice-Chancellor of Cambridge found it necessary to proclaim that "No graduate, scholler, or student presume to take tobacco into St. Mary's Church, upon payne of final expellinge the Universitie."

In 1651 the House of Commons considered the advisability of banishing tobacco from England.

King Charles I. was opposed to smoking; and King Charles II. wrote a letter to the University of Cambridge forbidding the members to wear periwigs, smoke tobacco, or read their sermons.

In the time of James I. the price of tobacco was 18/- per pound, and was chiefly sold in the shops of apothecaries.

Cromwell was an occasional smoker; many of the Puritans indulged in tobacco, and the following rhyme in

"The Wits Recreation, 1650," proves how general smoking was in the Commonwealth period :

"Tobacco engages
Both sexes, all ages,
The poor, as well as the wealthy,
From court to the cottage,
From childhood to dotage,
Both those that are sick and the healthy.

It plainly appears,
That in a few years,
Tobacco more custom hath gained
Than sack or than ale,
Though they double the tale,
Of the times, wherein they have reigned."

At the time of the Great Plague in London people came to believe that smoking tobacco was a sure preventive against the disease, and so women and even children were encouraged to smoke. In some schools, even at Eton College, the boys had lessons in smoking every morning. It is related that a certain Etonian was soundly whipped for not "smoaking" at his master's bidding.

It appears that the Quakers made a formal protest against tobacco smoking. Their aversion to it has continued up to the present, because they consider it contrary to the laws of the Creator for his children to depend on a narcotic drug for peace of mind and comfort.

The habit continued to spread during the reign of William III. It became so general among the members of the House of Commons that it became necessary to make a rule that no member was to take tobacco into the gallery or to the table sitting at Committees.

In the time of Queen Anne the poorer classes had become habitual smokers, the average cost being one penny a day all the year round. From the time of Queen Elizabeth to that of Queen Anne the smoking of pipes had been considered a sign of gentility and a fashionable accomplishment ; but when the habit became general among the poor people, "the quality" became uneasy at the spectacle of the poor man doing the same as the rich, so they forsook their pipes and stopped the smoking, and started a new accomplishment which they learnt from the

French. When tobacco is finely powdered it is called snuff; the leaders of society began to fill their nostrils with snuff, and to enjoy the new sensation.

The habits of the upper class were thus described in the year 1711 by some writers in the *Spectator :*

> "To such a height with these is fashion grown,
> They feed their very nostrils with a spoon."

Another writer complained of the handing round of the snuff box in church and chapel. It appears that chewing was much in vogue in churches, for he adds, "kneeling in church is prevented by the large amount of tobacco saliva ejected in all directions." The smoking of cigars was introduced into England by the military, who had learnt the habit in Spain, during the Peninsular War, while the habit of smoking cigarettes was acquired by our soldiers during the Crimean War. In the year 1795, the Wesleyan Conference passed a rule, that "no preacher shall use tobacco for smoking, for chewing or in snuff, unless it be prescribed by a physician." In the year 1877, the Wesleyan Conference refused to rescind this rule. This rule is now ignored. At most of the Conferences smoking rooms are provided. The habit of smoking has been indulged in by a large number of the Bishops and Clergy of the Church of England. The only prohibitions of which I have knowledge, are the "Counterblaste" of King James I., and the letter written by King Charles II. to the University of Cambridge. There are many of the Bishops and Clergy who do not smoke, but what a sad example a smoking clergyman sets the world. I presume they acquired the habit at the same time they were attending divinity lectures, and did it with the knowledge, if not the sanction, of their tutors and professors. I cannot believe it is right for the authorities at our Universities to permit the undergraduates to acquire a habit which lowers the moral nature, and lessens mental energy and bodily vigour. It would be better for a young man to be deprived of the advantages of a University than to run the risk of acquiring one of the worst habits of modern times.

It is truly a difficult task to rouse this nation to the danger of this habit. Indeed the task is beyond the power of man, singly or in combination, but with God, nothing is impossible. Our Lord's orders to His disciples

were simple, "Watch and pray." If we obey as a nation we shall conquer the habit and flourish as a nation, but if the nation continues in disobedience, smoking and slumbering, the nation will suffer.

About the year 1880, the cigarette became the fashion, and was soon taken up by boys and by foolish women. The evil of juvenile smoking soon became so great as to cause alarm. In the year 1907, the Legislature passed an Act, rendering smoking illegal under the age of sixteen. In the year 1909, I made inquiries of "General Booth" as to the regulations in the Salvation Army, and I received the following statement in reply :—

"Great Britain—

Local Officers	32,229
Bandsmen	13,904
Corps Cadets	5,038

"Colonies and Foreign Countries—

Local Officers	24,457
Bandsmen	7,208
Corps Cadets	5,191

"All these officers are total abstainers from alcohol and tobacco. (Signed), Theodore Kitching, Lieut.-Col."

If General Booth has authority to insist on all his officers and bandsmen being abstainers from alcohol and tobacco, I wonder why the leaders of our own Church of England do not follow his excellent example. I have no doubt that one of the reasons of the energy and zeal of the Salvation Army is the power they receive from the Holy Spirit which dwells only in temples which are sweet and holy. The activities and philanthropic works of the Salvation Army are the admiration of Christendom. There is no depressing narcotic in their blood to cause languor and hebetude. Their minds are clear, their nerves are steady, because they lead natural lives. Many smokers have set up pharyngeal and laryngeal catarrh and loss of power of singing and reading through the irritation of smoke on the mucous membranes.

CHAPTER III.

A List of the Names of the Medical Men who contributed Letters to *The Lancet*, to be found in Vol. I., 1857, condemning the use of Tobacco.

(1) Samuel Solly, F.R.S., Surgeon to St. Thomas's Hospital, London.
(2) David Johnson, M.R.C.S., Dudley.
(3) J. Pidduck, M.D., London.
(4) W. Pugh, M.D.
(5) Maurice Evans, M.R.C.S.
(6) W. Cortis, M.R.C.S., Filey.
(7) J. Ronald Martin, F.R.S., London.
(8) J. Higginbottom, F.R.S., Nottingham.
(9) S. Booth, L.S.A., Huddersfield.
(10) W. McDonald.
(11) C. B. Garrett, M.D., Hastings.
(12) G. Butler, M.R.C.S.
(13) Dr. Schneider.

I regard the letters written by the above-named gentlemen as worth reading, for they contain an amount of clinical knowledge on the evils of tobacco never before collected and brought to a focus. The whole controversy is too long to be included in my book, but I may state there is not one opinion or one fact which is not true. I will content myself by quoting the following:

Letter from an Oxford graduate to the editor of *The Lancet*: "Sir,—I have perused with great interest the tobacco controversy that has lately been carried on in your pages. Permit me, as an Oxford man, to bear witness to the

bad effects of 'the weed and the pipe.' As far as my experience goes, it is my opinion that *nine out of ten* first-class men are non-smokers, or, at least, smoke so little as not to deserve the name of *smokers*. Again, its weakening effects are borne witness to by the fact that men in training for boat races are *strictly* prohibited tobacco. When, sir, I see the pale and sallow faces of habitual smokers; when I hear them deplore the habit (or rather the necessity); when I hear them confess they are *unable* to begin their day's work without a pipe (or, at least, they would be miserable without the indulgence); when I see our College servants aping their masters, and thinking it fine to be seen with a villainous cigar or 'short clay' in their mouths; when I see the boys of Oxford (and even the little white-robed choristers of our College chapel) taking up the odious habit, making their little faces thin and pale, and ruining their constitutions; when I see all this, what conclusion can I come to but that tobacco is an evil—a *tremendous* evil; that Sir Walter Ralegh has been a curse to his country; that to him the sickly faces, stunted forms, and shortened lives of so many of our once sturdy countrymen, are in a great degree owing."

Extract from Editor's Article in *The Lancet*, 1857: "To the young man, and more especially to the medical student, in whom we are peculiarly interested, we would say: Shun the habit of smoking as you would shun self-destruction. As you value your physical and moral well-being, avoid a habit, which for you can offer no advantage to compare with the dangers you incur by using it. The bright hopefulness of youth, its undaunted aspirations, and its ardent impulses, require no halo of smoke through which to look forward upon the approaching struggle of life. Your manner of living must be bad indeed if you require anything further than sleep, exercise, and diet, to fit you for your duties as students. Your minds must be emasculated indeed, and arrant cowards must you be, totally unfit for the stern realities of what is to come, if you cannot face your present few and comparatively small anxieties, without having recourse to the daily use of narcotics. We speak from a large experience of medical students, when we say that the intemperate smoker is the intemperate indulger, as a general rule, in all that partakes of the nature of sensual gratification. It matters not that

many may, and do, pass through the ordeal unscathed. Vast numbers do *not*. Listless minds and languid bodies, slakeless thirst and shaking hands, delirium tremens, madness, and death, we have distinctly and surely seen to follow the unhallowed indulgence in youths who began their studies with bright promise of success, with fair characters, and honest purposes. It is not open to impressible and wavering youths to say, 'Thus far will I go, and no further.'

"To commence the downward course is too easy—to retrace the false step is too difficult; the risk is too great, the advantage too infinitesimally small, the interests at stake too supremely important, to allow the student once to begin. It is no sign of manliness to toy with danger, and sport upon the brink of a precipice. The impulse which may plunge the unreflecting boy into ruin may come, he knows not when, nor with how great force; let him prove his strength by avoiding, not by courting, danger.

"Let us enquire further, whether the physiological effects produced in the course of smoking afford any indications to what constitutes excess. Profuse salvation can hardly be compatible with the idea of *moderation*. Perpetual irritation of a mucous membrane can hardly be kept up with impunity. A large proportion of smokers must be aware that heartburn, eructations and apepsia surely follow one or two pipes, or one or two cigars, beyond the wonted allowance. The same excess is certainly followed by loss of appetite, and especially by loss of morning relish of food. Let the pulse be watched. Does it not decline in frequency below the normal standard, and is it not irregular after a very slight excess? Do not palpitation and præcordial anxiety much oftener annoy the habitual smoker than he would exactly like to confess? Is not the inclination to seek the recumbent posture, or to respire cold air, of frequent occurrence, when the smoker would hardly like to own it? Do not giddiness, dimness of vision, tremors, nausea, clammy perspirations, and tinnitus aurium frequently occur in the course of a long smoke? And do not each and all of these effects clearly and irrefragably establish *excess* in every case? We affirm most unhesitatingly that, setting aside idiosyncrasies, there is hardly an *habitual* smoker to excess who cannot be

condemned by the most casual observation of his bodily functions. And the further we move upwards in the social gamut, the more striking will be the physiological evidences of excess in every individual case.

"It is almost unnecessary to make a separate inquiry into the pathological conditions which follow upon excessive smoking. They have been referred to by the way. Moreover, abundant evidence has been adduced in the correspondence in our columns of the gigantic evils which attend the abuse of tobacco. Let it be granted at once that there is such a thing as *moderate* smoking, and let it be admitted that we cannot accuse tobacco of being guilty of the whole of Cullen's "Nosology," it still remains that there is a long catalogue of frightful penalties attached to its abuse.

Let us briefly recapitulate:

"(1) To smoke early in the day is *excess*.

"(2) As people are generally constituted, to smoke more than one or two pipes of tobacco, or one or two cigars daily is *excess*.

"(3) Youthful indulgence in smoking is *excess*.

"(4) There are physiological indications which, occurring in any individual case, are criteria of *excess*.

"We most earnestly desire to see the habit of smoking diminished, and we entreat the youth of this country to abandon it altogether. Let them give up a dubious pleasure for a certain good. Ten years hence we shall receive their thanks."

Arguments of a Defender of Tobacco, and the Answer thereto.

A defender of the use of tobacco, a member of the medical profession, wrote to *The Lancet*, 17 January, 1857, as follows: "The fact of smoking being almost universal, appears alone to indicate that there can be no very great harm in it; and so long as thousands and thousands by their acts and its results prove to me that smoking is not injurious, so long shall I despise all theories and statements to the contrary."

In answer to this remark, a letter appeared in *The Lancet*, January 31, 1857, by Dr. D. Johnson, as follows:

"The absurdity of such an argument for this worse than useless practice, appears evident from the following similar examples of reasoning. Opium eating is very prevalent in some other countries, intemperance in others; *ergo*, there can be no very great harm resulting from them. It is, in my judgment, anything but an evidence of wisdom, to argue the harmlessness of any practice on the ground of its universality."

Further on, Dr. Johnson wrote: "It seems very difficult for any man to go through this world with his eyes open, without perceiving thousands of persons who are suffering physically, mentally and morally, through indulgence in this obnoxious habit. What then is the testimony of facts on the subject of smoking? Why, for one inveterate smoker who will bear testimony favourable to the practice, ninety-nine such of the candid of these, are found to declare their belief, that this practice is injurious; and I scarcely ever met one habitual smoker, who did not in his candid moments, regret his commencement of the practice. It is a certain fact, that devoted smokers are liable both to constitutional and local disorders, of very serious characters. Among the former we notice giddiness, sickness, vomiting, dyspepsia, diarrhœa, angina pectoris; diseases of the liver, pancreas, and heart, nervousness, amaurosis, paralysis, apoplexy, atrophy, deafness, and mania.

"Most of these results I have selected from authors of some *locus standi*, amongst whom I may mention Doctors Prout, Bright, Laycock, Radcliffe, Ranking, Pereira, Orfeila, Trousseau, Johnstone, Sir Benjamin Brodie, and Professor Lizars."

Dr. Taylor in his valuable work on poisons, says, "That a poisonous substance like tobacco, whether in powder, juice, or vapour, cannot be brought in contact with an absorbing surface like mucous membrane without in many cases producing disorder of the system, which the consumer is probably quite ready to attribute to any other cause than that which could render it necessary for him to deprive himself of what he considers not merely a luxury, but an article actually necessary for his existence.

"The quantity of this poisonous weed entered for 'home consumption,' in the eleven months ending November, 1856, was 29,776,082 pounds. The deleterious

effects which this enormous amount of tobacco produced upon its victims, both physically, mentally and morally, admits of no possible calculation."

Dr. Schneider wrote as follows to *The Lancet*, January 31, 1857: "Sir,—Having had much experience of the baneful effects of smoking in my own country, Germany, which may be considered 'the great tobacco furnace of the age,' which is affected by her reeking atmosphere in many ways. I trust that my opinion may have some weight with your readers.

"The tendency of Germans to diseases of the lungs may be traced to their incredible passion for smoking, and our principal medical men and physiologists compute that out of twenty deaths of men between the ages of eighteen and twenty-five, ten originate in the waste of the constitution by smoking. So frequently is vision impaired by the constant use of tobacco, that spectacles may be said to be a part and parcel of a German, as a hat is to an Englishman.

"In America, likewise, where my practice has extended, I have noted the same pernicious effects, and it is a well attested fact that the Americans wear themselves out by the use of tobacco."

CHAPTER IV.

On "The Use and Abuse of Tobacco," by Wm. Marsden, M.D., living in Quebec in 1860, Fellow of the Medical Society of London.

"I was asked a few days since by one of our ablest surgeons and most distinguished physicians, whether I had remarked the decided increase in the number of deaths from diseases of the brain since my coming into practice. Having admitted the proposition, my friend whose shrewdness and quickness of perception is characteristic, was disposed to assign as the principal cause the character and quality of the spirituous liquors so largely indulged in by all classes. My own experience and opinion, however, turn to another cause—the excessive use of tobacco, and had I not since laid my hand on Dr. Lizar's invaluable book, my own observation in the course of a long and extensive practice would have furnished me with proofs innumerable.

"For several years past the discussion of what has been called the 'tobacco question' has engaged the attention of medical, as well as non-medical writers in Great Britain, and my quondam fellow-student, Mr. Solly, now a surgeon of St. Thomas's Hospital, London, has taken a prominent part in the discussion, and although the evils of excessive smoking prevail as extensively in Quebec, as in Great Britain, the medical profession, to which the public looks as the rational exponent of sound principles in relation to man's health and physical habits, has hitherto been almost silent on the subject. If any medical man feels that by simply raising his voice he may

be the means of saving the life, or preserving the health of a single fellow being, who may be unconsciously shortening his days by indulging in what he calls an innocent pastime and luxury, *he is culpably negligent if he remains silent.*

" ' The profession,' says Mr. Solly, ' have no idea of the ignorance of the public regarding the nature of tobacco. Even intelligent, well educated men stare in astonishment when you tell them tobacco is one of the most powerful poisons we possess. Now is this right? Has the medical profession done its duty? Ought we not, as a body, to have told the public that of all our poisons, it is the most insidious, uncertain, and in full doses the most deadly ? '

" Dr. Lizars enumerates the constitutional effects of tobacco by stating that they are ' numerous and varied, consisting of giddiness, sickness, vomiting, dyspepsia, vitiated taste of the mouth, loose bowels, diseased liver, congestion of the brain, apoplexy, palsy, mania, loss of memory, blindness, deafness, nervousness, emasculation, and cowardice.'

" Frightful as is this list of ills, I can from my own experience endorse its accuracy, and yet how large a number of our own profession are addicted to the vice, and how fatal must be the effect of their example upon the unthinking.

" Professor Laycock, of Edinburgh University, says in a most temperate paper in the *Medical Gazette*, October 2, 1846 : ' I have known many instances in which I was unable to prove that the ordinary use of tobacco did any harm ; I have known many more in which I could prove that it did do harm ; and I have not known any good from it that might not have been obtained by other less objectionable means.'

" I will only make a few more extracts from Dr. Lizar's paper, in order to support the view I have enunciated that tobacco is the fruitful source of paralytic affections :

" ' Congestion of the brain, which is a frequent precursor of palsy, occurs almost only in those much addicted to smoking, in whom a cigar is never out of the mouth. It is denoted by headache, want of sleep, or rather restless nights, and occasionally flushing of the countenance. Apoplexy has been noticed by several authors supervening the smoking of tobacco, also the immoderate use of snuff.

The form of palsy produced by excessive smoking is almost always hemiplegia, and is usually incurable. Mania is a fearful result of the excessive use of tobacco, two cases of which I have witnessed. I have also to mention that a gentleman called on me and thanked me for my observations on tobacco, and related to me with deep emotion what had occurred in his own family from smoking tobacco. Two amiable younger brothers had gone deranged and committed suicide.'

"'I lately visited a gentleman in a lunatic asylum,' says Dr. Lizars, 'labouring under general paralysis, and his mind becoming idiotic. On corresponding with his former medical attendant, I understand his habits were temperate as regarded drink, but he worked hard in a mercantile house and smoked to excess.'

"Dr. Webster cites among the causes of mental diseases the great use of tobacco, and he supports this opinion by a reference to the statistics of insanity in Germany.

"'Loss of memory,' says Dr. Lizars, 'takes place in an extraordinary degree in the smoker, much more so than in the drunkard.'

"A valued and talented medical friend, whose pipe is scarcely out of his mouth when at leisure, is an instance of the foregoing condition, and who, besides, suffers from fearful neuralgic attacks of the head; but alas! I have failed to convince him that tobacco is in any way the cause. To all who have suffered or may be suffering under the pernicious influences of tobacco, I cannot give any more useful or proper advice than is contained in the stereotyped phrase of Dr. Lizars, in the treatment of the different species of disease, induced by the use of tobacco, '*Throw away tobacco for ever.*' (*Signed*) W. Marsden."

I think it should greatly aid me in my task, if I here insert an extract from "Essays by the late Sir Morell Mackenzie, M.D.," etc. The MSS. came to the hands of his brother, by whom they were published in 1898.

There can be no doubt but that the professional opinions of that eminent throat specialist must have very great weight in the minds of my readers, especially so if they will consider the fact, that although Sir Morell was a smoker, yet, in his "Essay on Tobacco," with the whole force of his professional talent, he gave his unbiassed opinion to the world, as to the detrimental effects of the

tobacco habit. Surely these opinions are worth credence, and must inevitably carry conviction to *all* reasonable minds.

Sir Morell Mackenzie wrote thus : "Medical men, who have eyes for such things, can see the baneful effects of immoderate smoking writ large on nearly every part of the mucous membrane of the throat. It is often the abuse of tobacco that is at the bottom of chronic congestion or other deviations from the normal condition of the throat which are put down to other causes.

"The effects of tobacco on the body are both general and local, it acts on the nervous centres and on the heart, as well as on the parts with which the smoke or the juice comes immediately in contact. It usually finds expression in what is vaguely called 'nervousness,' the pulse becomes flurried, and the muscles more or less relaxed and unsteady : this is why smoking is so strictly forbidden to men training for athletic feats. An occasional pipe or cigar would probably not be hurtful, but trainers are unanimous in forbidding tobacco in any form. The cause of their attitude in this matter is, no doubt, the fear that moderation might lead to excess, and convinced as I am of the deplorable effects of over-indulgence in smoking on steadiness and precision of muscular movement, I cannot say that I feel surprised at the apprehension of trainers.

"So marked is the effect of tobacco in relaxing the whole of the muscular system, that before the days of chloroform it was employed in surgical operation, in which it was necessary that the muscles should be perfectly limp. It will thus be readily understood that under the influence of a drug possessing these properties, the delicate adjustments of the complicated vocal machinery are to some extent disordered, and the voice is out of tune and harsh. Something analagous to what takes place in the eye as the result of the abuse of tobacco occurs in the larynx, or in the part of the brain which governs the movement of that organ. Oculists are familiar with "tobacco amblyopia," that is, *dimness* of sight, due to what may be called figuratively, *blurring* of the retina by tobacco smoke.

"The tongue often suffers severely from the effects of tobacco. Small excoriations, blisters, superficial inflammation, and white patches are formed on the surface of the organ, and a permanently unhealthy condition is

induced, which in those predisposed to cancer is apt, under the influence of advancing age, or as the result of prolonged vocal irritation, to lead to the development of that disease. The same observation applies to the superficial ulceration which affects the sides of the root of the tongue. In this situation there are a number of delicate projections, or so-called "papillæ," the exquisitely fine points of which readily become inflamed when exposed to irritation. It is in this situation that cancer of the tongue is exceedingly apt to commence.

"Smoking at times causes chronic inflammation of the lips, which gives rise to cracks which are always very troublesome, and not infrequently end in deadly disease.

"The effects of smoking on the throat, when the habit has not been too long indulged in, can as a rule be easily cured by the simple remedy of discontinuing the practice which engenders them. In considering the evils produced by smoking, it should be borne in mind that there are two bad qualities in the fumes of tobacco: the one is the poisonous nicotine, and the other is the high temperature of the burning tobacco. The Oriental hookah, in which the smoke is cooled by being passed through water before reaching the mouth, is probably the least harmful form of indulgence in tobacco; and the cigarette, which is so much in vogue now-a-days, is most certainly the worst. It owes this 'bad eminence' to the very mildness of its action, people being tempted to smoke all day long, and easily accustoming themselves to inhale the fumes into their lungs, and thus saturating their lungs with poison.

"If smoking is indulged in to excess the habit is always injurious, and I am sure that a great many persons either cannot see, or wilfully shut their eyes to, the 'scientific frontier' which separates moderation from abuse.

"To conclude with a little practical advice: Let him who wishes to keep in the 'perfect way' refrain from inhaling smoke, and take it as an axiom, that the man in whom tobacco increases the flow of saliva to any marked degree is not intended by nature to smoke."

The Opinions of a Parsee.

"Smoking," he says, "juvenile or adult, is to be condemned from a worldly as well as a medical point of

view. One of the smallest and yet most prosperous nations in the world, the Bombay merchants—the Parsees—who number no more than a hundred thousand, is forbidden by its religion to smoke; and as a result it stands at the head of the myriad races and castes and creeds of India, all of them addicted to the luxuries of the smoking habit; and it can claim to have a higher percentage of clever men than any other nation."

How to check Juvenile Smoking.

Employers of youths, doctors and teachers, should unite in opposing cigarette smoking among youths. Many expensive blunders in business may be traced to a tobacco brain-fagged clerk. In a great school the head-master asks every boy on leaving to sign, if he will, a promise not to touch tobacco or alcohol till he is twenty-one. It is not surprising that the school has a fine record for successful pupils, seeing that the majority of boys have signed.

A Dissertation on the Use and Abuse of Tobacco, by Adam Clarke.

"To those who are not yet incorporated in the fashionable company of tobacco smokers I would say: Never enter.

"To those who are entered I would say: Desist. First, for the sake of your health, which must be seriously affected by it. Secondly, for the sake of your property, which, if you are a poor man, must be seriously impaired by it. Thirdly, for the sake of your time. Fourthly, for the sake of your friends who may be annoyed. Fifthly, for the sake of your voice, which will be ruined by smoke. Sixthly, for the sake of your memory, that it may be clear and retentive to the end. Lastly, for the sake of your soul. Do you not think that God will visit you for your waste of your talents, your time and your money, and needless self-indulgence?

"Have you not seen that the use of tobacco leads to drunkenness?"

CHAPTER V.

Remarks on *The Lancet* Tobacco Controversy of 1857, by the Author.

It must not be supposed that those medical men who enjoyed the charms of "Lady Nicotine" were not greatly excited when their habit was assailed. Many letters were written to justify the uses of tobacco and praise its virtues, but no facts were mentioned to prove its benefit, and therefore I refrain from reproducing the letters. The views of the Editor of *The Lancet* were expressed in a diplomatic spirit; he did not deny the terrible evils of excessive smoking, and he wisely urged all youths under twenty-one years to abstain entirely. His advice to all confirmed smokers to be strictly moderate, seems to show that he either under estimated the seducing power of tobacco to make slaves of its votaries, or he over estimated the self-control of the ordinary smoker. It is morally wrong, in my opinion, to recommend a bad habit even in moderation. Give the devil an inch and he will take a mile.

I think the former Editor would be grieved and alarmed for the future of the British race if he were alive now, and witnessed the crowded smoking carriages on the railways, full of men on their way to business, commencing the day by filling their lungs with poison. I notice much smoking in this town (Torquay) on the streets before 9 o'clock in the morning. I would urge all men who wish to fulfil their duties in life to break off a habit which can do no good and may do much harm, and which certainly is a self imposed tax. It is true that many great thinkers and writers have praised tobacco at some time while they were

under the influence of its soothing effects, but could we only hear their final verdict during the declining years of life, it might be different.

The medical profession has a great responsibility, and if we fail as a body to realize the evil effects of the tobacco habit, we shall be unworthy of the confidence of the public. I can quite endorse Mr. Solly's statement of the widespread ignorance of the public as to the poisonous nature of tobacco.

Is it not possible for the medical officers in the Army and Navy to take steps to check this evil? How can we expect to preserve health, while the springs of life are poisoned by tobacco? We know that professional athletes and others always abstain from tobacco when in training; should not our soldiers and sailors take the same care of their health? Is it not their duty, as defenders of their country, to be always fit and ready for any emergency?

Many critics will doubtless argue that the opponents of tobacco have described only the evil effects of excessive smoking, and they will perhaps try to prove that smoking in moderation is harmless and perhaps beneficial in a medical or therapeutic sense. If tobacco is of use in the treatment of disease, it is strange that no place is found for it in the British Pharmacopœia. Is there any evidence to prove that smoking in moderation is beneficial to a healthy man? It seems absurd to suggest that a healthy man can require a moderate dose of narcotic poison every day to quieten and soothe his nerves. I think I know enough of human nature to realise that young men, when they begin to smoke, do not inquire as to the action of tobacco smoking on the mind and body, but are only influenced by a desire to do as their elders, because it is considered a sign of manliness by boys. I sympathise with boys in their desire to be manly, but I regret that they should have such a false idea of manliness. I do not deny there are many moderate smokers, but I am convinced there are far more immoderate smokers, while the transition from the one class to the other goes on constantly and imperceptibly. A man who boasts that he is a moderate smoker, and says he does not injure his mind or body, is a danger to society, because his example is likely to be followed by young lads who may become slaves to the habit and shorten their days thereby. I admit it is

possible for a man who possesses a strong will to limit himself to one pipe or cigar a day, and not to know that his organism is injuriously affected thereby ; but my opinion, as a medical man, is that it is extremely unwise and hazardous to indulge in a narcotic poison even in strict moderation. I ask if it is right to allow the rising generation to acquire a habit that may do infinite harm to mind and body and cannot possibly do any good.

I remember once noticing a friend of mine smoking a large wooden pipe with the word "hebetude" carved on the bowl. I asked him the meaning of the word. He smiled, and told me his father had frequently told him that he would smoke himself into a state of "hebetude," but he offered me no explanation of the meaning of the word. His father's words were true. My friend continued to smoke heavily all his life, and became incapable of active bodily exercise ; he was abstemious in alcohol, but I verily believe his whole system was always saturated with nicotine. He died recently in the prime of life after a short illness.

I must now explain the meaning of the word "hebetude," it is a noun meaning dulness or stupidity ; it is derived from the Latin word,

"*Hebeto*," I make blunt or dull ; I dim, deaden, or weaken.

There is also the verb,

"*Hebeo*," I am blunt or dull, sluggish, inactive, not lively, lounge about.

The English language derives the following words from the Latin :

"Hebetate," to blunt, stupefy ; as, to hebetate the intellectual faculties.

"Hebetation," the act of rendering blunt, dull or stupid.

"Hebetude," meaning dulness, stupidity.

Does not this word describe accurately the state of mind produced by excessive smoking ?

Am I correct in my opinion that a part of the British nation is silently, heedlessly, blindly, drifting into a state of hebetude, idleness and decrepitude ? Am I correct in thinking that the prophetic words of Mr. Solly, which he wrote fifty years ago, have proved true ? "I believe, if

the habit of smoking in England advances as it has done in the last ten or twelve years, that the English character will lose that combination of energy and solidity which has hitherto distinguished it, and that England will sink in the scale of nations."

Mr. Solly was an eminent surgeon in his day, and a Fellow of the Royal Society. He could not shut his eyes to the evil effects of the tobacco habit, and he tried to influence his professional brothers to speak the truth as far as they could of the different diseases resulting from smoking. His efforts were successful in rousing great interest, and a vast amount of reliable evidence was recorded in the pages of *The Lancet*. The fact that these letters were written fifty years ago does not detract from their value. They bear the stamp of careful enquiry and sincerity, and are the experience of men who practised medicine in different parts of our empire. Many of them had been smokers and experienced in themselves unpleasant symptoms, hence they wisely gave it up. When they emerged from darkness into light they hastened to spread the truth, to prevent others groping in darkness. I still rejoice at my own liberation from the delusion that tobacco is a panacea for all the ills of life. I am convinced that smoking is a hindrance to the full enjoyment and exercise of the faculties of mind and body. What is the verdict of many an honest smoker? I have heard many smokers express deep regret at being slaves to the habit, confessing its uselessness and its expense, and other drawbacks.

Tobacco tends to make the bread-winner dull of intellect, disinclined for hard work, feeble of digestion, short-winded, short-sighted, dry in the throat, and often thirsting for intoxicating drink. So the unfortunate man has to supply his craving for tobacco and drink before he satisfies the claim of his wife and children. The wife and children are deprived of necessary food and clothing and become feeble and debilitated, if not actually victims to disease. We cannot eradicate disease entirely, but we acknowledge that a great many diseases are preventable, and certainly those which are induced by tobacco and alcohol are preventable.

The medical profession has, at last, roused itself to warn the public about the dangers of excessive drinking, and at last it recognises that the value of alcohol as medicine

has been greatly over-rated—the cause of truth advances slowly in our country, because we are so disinclined to think for ourselves and to break through old customs. Is it not our duty to help the rising generation to grow up strong and healthy and free from narcotic taint? Is not hygiene a neglected science amongst the rich and poor? Books on hygiene do not recommend the use of tobacco even in moderation.

The evils of tobacco inebriety are truthfully described by Dr. Crothers in his work on "Morphinism and Narcomanias from other Drugs," published by Saunders & Co., London, 1902, he writes thus: "The tobacco addiction is usually associated with alcohol or other drugs, hence the tobacco disability is seldom considered. In reality, tobacco is a narcotic poison, and its use is not only dangerous, but it is certain to be followed with debility, mental perversion and exhaustion. Statistics show that students and brain workers who use tobacco have less vigour, both mental and physical, and are more liable to disease."

I maintain that the education of a medical man is not complete if he fails to realize the harm of smoking. The subject should be taught in all medical schools as a part of the curriculum. It is unreasonable to expect greater knowledge among the laity than medical men. We must lead the way, teach the truth, and show our consistency by acting up to our knowledge. Who can deny the truth of the evidence contained in the pages of *The Lancet* which I have quoted? The fact that a few men can smoke without harmful consequences, does not prove that it is beneficial to them. No man is justified in playing with poison. I am convinced that the smoker has less resisting power to disease than others.

My opinion is corroborated by the results of the experiments of Metchnikoff, who has discovered that the white corpuscles of the blood, which he calls phagocytes, eat up intrusive bacteria and other germs, and are the chief means in warding off disease; so that the man or animal who has the normal quantity of healthy active phagocytes is immune, that is to say, he cannot be effectively attacked by disease germs.

Metchnikoff's conclusion is that the phagocytes in our bodies should be stimulated in their activity, in order to

successfully fight the germs of infection. He states that alcohol, opium, and quinine hinder the phagocytic action. He does not refer to tobacco, as far as I know, but he declares that opium hinders the activity of the phagocytes (*vide* Address by Professor Ray Lankester, at the meeting of the British Association, reported in the *British Medical Journal* of August 11, 1906). For all we know to the contrary, tobacco may be extremely fatal to them. We depend for immunity, from the attacks of disease germs, on the efficiency of our phagocytes; they form the first line of defence, therefore it is the height of folly, and almost suicidal, to impair their efficiency.

What about the old belief that smoking was a safeguard against infection? It was based on a want of knowledge, and it was a capital excuse for those who liked tobacco. The light of scientific investigation has come to our help, and clearly indicates the dangers of tobacco and other narcotics in rendering the phagocytes inefficient for their physiological functions. We owe a debt of gratitude to Metchnikoff for his discoveries. There is now no excuse for using tobacco, except for simple indulgence, as a form of mental intoxication. Whether it is dear at the price is a matter of opinion. *Chacun à son goût.*

This consideration opens up an important question for medical officers in the Army and Navy. Ought they not to avoid smoking, and teach their men to do the same? It is a serious question and demands instant attention.

We want an efficient army and navy to protect our country, our colonies, our Indian empire and our commerce.

We need efficient, clear-headed, far-seeing statesmen and legislators to govern wisely.

We need ministers of religion to set an example of the Christian life, and to show us the advantage of leading a "godly, righteous, and sober life."

We need medical men who will live up to the spirit of the ancient Hippocrates, and warn their patients against "anything harmful and mischievous."

We need parents and teachers to persuade boys, girls, young men and women to avoid the smoking mania.

We need a long pull, a strong pull, and a pull all together, to save the rising generation from falling victims to a big snare and delusion.

Does smoking promote frivolity of mind? I think no

one will deny that the present generation is frivolous. It may appear absurd to connect this phase of character with tobacco, but I know from my personal experience that my own character underwent an extraordinary change under the influence of tobacco. I account for it in this way: one of the known effects of tobacco is to cause forgetfulness, especially of higher things. A dreamy reverie takes the place of manly activity. The discipline and simplicity of early days is forgotten in the clouds of tobacco, and the man who was once in serious earnest in his work may become frivolous, capricious and lethargic.

Look at the countries of Europe now, mostly absorbed in frivolous amusements, and doing little to help the oppressed, or to relieve the sufferings of humanity. The whole body is sick, but the frivolous take no heed. "Let us eat and drink and smoke and enjoy ourselves" is the guiding principle of the multitude. Frivolity must be considered a disease of the mind.

We want healthy minds and bodies, and I ask how can men reasonably expect to be strong, vigorous, and contented who perpetually imbibe a narcotic poison which stupifies the brain? I am quite certain that smoking does cause forgetfulness and stupidity, and I am of opinion that many serious accidents are the result of temporary oblivion, the immediate result of narcotic poison.

Seeing that tobacco obscures the reason and the intellectual powers, it may be answerable for the want of chivalry, and the want of religion, which we deplore among the Christian nations of Europe and America. It is obvious that forgetfulness is a common result of smoking. I notice it every day of my life. The young men who are smokers are most forgetful, even in the ordinary affairs of business. Many notes of warning have been recently uttered by thoughtful men of various schools, but the people heed them not. The only remedy is to teach the rising generation to abstain from tobacco.

Personal Experiences.

I dread touching on this subject, for I consider that the day when I began to smoke was the most unfortunate day in my whole life. I have often testified to the injurious effect it had on me, morally, mentally and physically. I

broke myself of the habit finally, with great difficulty, many years ago, and I would not take it up again if I were offered untold wealth to do so.

I decline to describe the sufferings I endured, and the paniful struggles of conscience; it is enough for me to say that I am fully convinced that tobacco can become a quencher of the Holy Spirit in a man. I may mention one of the ill effects I experienced from tobacco, viz., occasional loss of sleep after smoking a cigar; only those who have been deprived of a good night's sleep can appreciate its value. Natural sleep is the most precious medicine Nature can give. Art can supply no substitute. This proves that tobacco has a disturbing or exciting action on the brain, resulting from the weak action of the heart, and not to the direct action of tobacco on the nerve cells of the brain.

Insomnia is one of the evils of the day, and is often the result of excessive brain work and anxiety. Can tobacco be recommended as an antidote for a weary, overworked brain? My prescription would be—rest, and food, and fresh air, together with entire abstinence from alcohol and tobacco.

How does tobacco affect a married man in his home? Under the influence of tobacco he becomes dreamy, lazy, and disinclined for any exertion. He is tempted to shirk many little domestic duties which he might perform, but he hopes his wife will save him all trouble and let him enjoy his reverie. He is no comfort to his wife, and she gets little sympathy from him. Her life becomes one long dreary never-ending task; if sickness attacks the children, all the responsibility is thrust on her shoulders; if the husband is out of work, the wife must go out as a charwoman to provide bread for the husband and children. The willing horse does all the work, but she must be a strong woman if her health will stand such a heavy strain. I think this is no exceptional case: I see so many pale, haggard, thin, care-worn, wrinkled, and yet young women, and I wonder what are the causes, and I think I have pointed out one, at least. Not only is the poor wife overworked all day, but she is liable to be poisoned by night by the exhalations of nicotine which rise from the skin and the lungs of her husband. Then she has headache, faintness, and giddiness, but no one

suspects these are the symptoms of nicotine poisoning! The true causes of such symptoms are never suspected.

It is nobody's business to trace disease to its original causes, unless the general practitioner undertakes it. As a rule he has little time for such an enquiry, or feels that it is useless.

I have heard medical men argue that smoking cannot be one of the chief causes of insanity because the asylums have more female inmates than male. I ask if it is unreasonable to suggest that the gross and brutal selfishness on the part of a husband is not calculated to cause insanity in the wife?

Nothing is more difficult than to trace mental disease or insanity to its true origin; there is, however, only too much evidence to show that excessive smoking has often caused insanity. Experience teaches that the mental condition of a husband influences that of his wife: if he is cheerful, hopeful and contented, it helps the wife to be like him; on the other hand, when the husband is morose, dull, idle, or fond of drink and tobacco, he exerts a bad influence over the wife. Hence, the husband who abuses himself with tobacco and alcohol will ultimately destroy his wife's health and happiness. An unhealthy woman is unable to rear healthy children, even in a good environment, and this, I believe, is the explanation of the excessive amount of disease amongst the children of the rich and poor in the countries of Great Britain, Europe and America. Sickly children are always peevish and fretful, and when the parents get weary of their crying they give them sweets to pacify them. A craving for sweets is acquired early in life, and prevents the proper nourishment of the child. The sickly and stunted children that now crowd the schools of this country are a source of grave anxiety to all thoughtful people.

The report of the Inter-Departmental Committee on Physical Deterioration contains ample evidence of the widespread evil of alcoholic excess among men and women, both as a cause of disease and poverty. The evils of juvenile smoking in checking growth were emphasized by Professor Cunningham, but no inquiries were made as to the evils of excessive smoking among adults. This is a serious omission, as superficial observers are apt to conclude that smoking is a harmless pastime. In my opinion it is a

dangerous habit for a youth under twenty-one, and is liable to lead to gambling, drinking and other vices. It always seems illogical to suggest or assert that smoking is harmful before the age of twenty-one, and harmless after that age. I have never yet received an explanation on this point.

It puzzles me to know how boys will be prevented from smoking and injuring their prospects so long as they see their parents and teachers set such store on it. I was speaking to a man lately, and he said, "smoking is the only pleasure I have in life." Are there not many like him? When I was in London two years ago I noticed a number of "unemployed" sitting contentedly on the seats and parapets on the Thames Embankment. The majority had their pipes in their mouths and their hands in their pockets, and they did not look eager for work. Now everyone knows that tobacco is not food, but the craving for a smoke is so strong in some men that they are content to starve their stomachs in order to satisfy the craving for a whiff of poison. Such men soon fall victims to consumption and other diseases.

All observers are agreed that the chief factors in causing disease are over-crowding in small tenements, female factory labour, and want of proper care of infants and children. We must not be content with these statements, but we must inquire how it happens that these people are living under such conditions. Why are they so poor that they cannot afford to pay the rent of a nice cottage? In too many cases their poverty is caused by their indulgence in tobacco and strong drink. What proof can I give of this statement? Is there any village or town so poor that it cannot support one or more public houses and many tobacconists? The very poorest districts can pay for these injurious luxuries.

The law takes care of the property of youths under twenty-one, and does not allow a minor to have control of his property, he is placed under guardians: why does not the law also take an equal care for the health of his body? The most critical time of a lad's life is just after leaving school; if he forms bad habits then he may never be able to regain his self-respect; he needs guidance, help, and protection till he reaches the age of twenty-one. Do fathers and mothers always realize their responsibilities?

and do they behave themselves in such a way as to be entitled to the "honour" which children are commanded by God to give to their parents? Do parents try and help their children to keep the Fifth Commandment? Can children honour and obey parents who stagger, and fight like demons, when under the influence of drink? Have we traced the craving for alcohol to its origin? It is not a natural craving, it is acquired. In my experience non-smokers hardly ever become drunkards, while nearly all drunkards are smokers. I am of opinion that the only way to check intemperance is to persuade the lads of our country to pledge themselves to abstain from tobacco and alcohol until they reach the age of twenty-one. Does this suggestion seem impossible? by no means, if the Christian men and women combine and determine to organize societies all over the country to effect this purpose; the majority of lads will see that it is for their good and gladly give the pledge. I appeal to all those who love and serve our Lord Jesus Christ to help in this work.

The words of the poet Longfellow must be our watch-word and our motto:

"The wrong shall fail,
The right prevail,
With peace on earth,
Goodwill to men."

It will be a hard fight to reclaim our lads for purity and sobriety, but "if God be for us, who can be against us?"

CHAPTER VI.

MIND YOUR MIND AND YOUR MIND WILL MIND YOUR BODY, AND YOU WILL POSSESS A SOUND MIND IN A SOUND BODY.

IT is my opinion, that many diseases which are now ascribed to alcohol, are really due to tobacco. It seems strange that the medical teachers should fail to see the connection between tobacco and the ever increasing disorders of the nervous system, the arterial system, the digestive system and the pulmonary system. Last, but not least, are the disorders of the sexual system which occur in the male and the female. When the costs and penalties of the tobacco habit are fully and fairly considered, we must certainly agree with the opinion of the late Sir B. Ward Richardson, M.D., "that smoking is a doubtful pleasure with a certain penalty."

I have heard many arguments from all sorts of men, and many ingenious excuses for a puff, but the only one that meets my approval is the case of a man with a scolding wife, who goes out of doors to look at the stars and smoke a pipe to keep his wife at a safe distance. I plead specially with medical men, because they are trusted by the public to speak the truth, the whole truth, and nothing but the truth, in all matters which concern the health. We are not compelled to denounce the use of alcoholic beverages in moderation, but we ought to denounce every drug habit as highly dangerous.

I regard the smoking of tobacco as the most universal and pernicious of all drug habits. It is instructive to trace the origin of the tobacco habit, and compare it with the origin of the alcoholic habit. Wine is mentioned frequently in the Holy Scriptures, and our Lord, by a miracle at

the marriage feast in Cana, turned water into wine. The use of wine has the best credentials, but the smoking habit was copied from unlettered savages. It is still a universal habit among uncivilised races. It is more common among women than men in Uganda. I hope some smoker may follow the example of the black woman, who of her own free will gave up smoking when she became a Christian, because the missionaries had taught her, that her body was intended to be a temple for the dwelling of the Holy Spirit, and she felt it would be wrong to blacken such a temple with tobacco smoke.

"HONOUR THY FATHER AND THY MOTHER, THAT THY DAYS MAY BE LONG IN THE LAND."

To disobey is to dishonour. I know of many young men of great promise, and of excellent character, who after beginning to smoke, have come to utter grief, and brought sorrow and shame on their parents. When I lived in London I was intimate with five young men, all brothers, well educated men, with good prospects; four of them began to smoke, and one by one they died off, having accomplished nothing to their credit. Tobacco and drink were the causes of their downfall. The only one of that family, now alive, refrained from smoking, and he is an active, clever, and prosperous man. There is nothing more distressing than to see a man become a wreck through his own folly. I know these young men acted contrary to the wishes of their father, for I know he hated smoking. The habits of his sons were a source of great grief to him.

There are some people who try to argue that tobacco is good for some, and bad for others. Every medical man knows that tobacco contains a deadly poison called nicotine. If a man swallows a few drops of nicotine, he will fall down insensible at once, and probably die from the effects in a few minutes. Some men argue that smoking is not forbidden in the Bible. I think that the Sixth Commandment is applicable, "Thou shalt do no murder." There are different ways of committing murder; there is the sudden murder, and the slow murder. If a man takes frequent whiffs of poisonous smoke, he is shortening his life, therefore he is killing himself by slow degrees; this is murder by slow processes. There is a great uncertainty about the effects of tobacco; sometimes

it causes sudden death by stopping the heart's action. We know that God has great respect for human life. Cain was banished for killing his brother Abel. The answer which went up from the first murderer is often repeated in our own day, "Am I my brother's keeper?" What answer does our Lord give to this question; he answers, "Thou shalt love thy neighbour as thyself." It seems to me, therefore, it is the duty of all who know the evil effects of smoking, to do all they can to warn those who are ignorant. Every man knows that smoking is particularly detrimental to boys under twenty-one. It will stop their growth, weaken their minds, and make them short-winded and weak. Do boys know all this? Now I venture to say, if men and women would combine and use their authority, the boys could soon be reduced to obedience. It requires a little patient remonstrance, and a few words of kind warning.

I cannot imagine why boys smoke, it is very unpleasant. No one would dream of climbing on the roof of a house and holding his head over a chimney and breathing the smoke, and yet coal smoke is less poisonous than tobacco smoke. The only explanation I can give is, that we have a great idol in this land called Fashion. Fashion is stronger than the King. Fashion is an autocratic tyrant, his subjects are slaves, and are not allowed to think for themselves or choose between right and wrong. This is not right; we are the children of God, and we must not let Fashion rule over us. God alone should rule over us; He should be our supreme Ruler, and we should disregard the fashion of the world when it is contrary to God's laws. I am quite convinced that smoking poison cannot be pleasing in God's sight.

There are many popular delusions about tobacco; many people believe that tobacco keeps off the infection of disease. I don't believe it for a moment. That is an old-fashioned belief. With regard to boys, it spoils them for cricket, football, and all athletic sports. Is there anything manly in it? Does it require any skill or courage to smoke cigarettes? No! any fool can smoke and lounge about.

I am a practical man, and know it is impossible to stamp out all diseases, or to prevent accidents, but there is no reason why we should actually go to the cost of spending millions of money on two things which we know produce,

by their consumption, a large percentage of the deaths which occur, and which also lead to crime, insanity, disease and poverty. These are facts which cannot be controverted. I now make an earnest appeal to my professional brethren in all parts of the British Empire to take a forward step at once, and set the example of self-denial and abstinence from all hurtful things. Let us show to the world that we regard alcoholic beverages merely as luxuries, which should rarely be indulged in, if at all, and also let us speak the truth about the dangers of all drug habits, such as tobacco, opium, morphia, cocaine, Indian hemp, &c. &c.

I have no desire to dictate to the members of my profession who have learnt to regard the daily use of tobacco as a necessity, but I do wish to remind them that the habit has frequently induced physiological discord in the human body, and turned a healthy man into an incurable invalid. I cannot hope to write a complete history of the diseases caused by tobacco, for there is not an organ or tissue of the body which is not liable to disease from the poisons which enter the blood; but I hope to write enough to awaken an interest in the importance of tracing all illnesses and diseases to their true sources. This branch of medicine is called Etiology; it is difficult, but may be acquired by experience. It is highly useful to the practitioner, who is often puzzled to explain the origin of an illness.

The object of Education is the Training of the Mental Faculties to discriminate between good and evil, truth and falsehood, to help us to avoid evil habits. An intelligent man can always give a sound reason for his opinions and actions. I have frequently asked men who smoke to explain what advantages they derive from the use of tobacco. I have never yet had a satisfactory explanation. The usual answer is: "It is a habit, it passes the time." That amounts to a confession of its uselessness. Why should a man smoke and inhale poison to pass away the time? God has made us for higher and nobler purposes than puffing tobacco smoke into our nostrils and lungs. Do we intend to educate our boys to seek comfort in tobacco, rather than in the sympathy and friendship of the Great Physician? If that is our purpose we should be consistent, and instead of offering

up the incense of tobacco in our homes and in the streets, we should offer it in our places of worship, and call ourselves " Narcotists," and not Christians.

I maintain that every medical man should be conversant with the diseases caused by tobacco smoking, and should use his best endeavours to save humanity from the slavery and dangers of narcotism. I am fully convinced that tobacco smoking has come to be the source of many of the evils which now afflict us, and I believe it promotes a craving for strong drink. My feelings prompted me to read a paper on this subject before the State Medicine Section of the British Medical Association at the Annual Meeting held at Exeter in 1907. There was a poor attendance, and I was requested to cut short my address before I had been ten minutes on my feet, as some members wished to catch a train to attend a luncheon party at a distance. I urged the importance of promoting definite teaching of the evil effects of tobacco in all medical schools, and that an effort should be made throughout the Empire to save the rising generation from acquiring the smoking habit. I called special attention to the intimate connection between the use of tobacco and mental disorder, proving that tobacco is a frequent cause of insanity.

I can only characterise the discussion which followed the reading of my address as frivolous and puerile and utterly unworthy of the Association. After making further efforts to procure a sub-committee to inquire into the diseases caused by tobacco and meeting with no support, I lost confidence in the principles and practice of the Association and withdrew my name from the roll of members. I determined henceforth to carry on a crusade against tobacco by God's help alone, trusting to the guidance of the Holy Spirit. When I realize how many members of the learned professions have become slaves to tobacco, and that the Church and Medicine and the Law suffer from tobacco blindness, I tremble, lest the love of tobacco, which stands for narcotism, should be able to destroy our Church and Nation. If seventy per cent. of the Church and Nation use tobacco, then it follows that the same number of people are liable to tobacco paralysis and other evils which promote decay and disease. I believe that over seventy per cent. of men between the ages of

eighteen and fifty are habitual smokers. They have commenced a habit which promotes the downfall of the individual. If seventy per cent. of the men of this Empire are destroying their manhood, what will happen to the women of the Empire, and what sort of children will be born of these smokers? It is my duty and pleasure to state that I received many letters of congratulation from strangers who had seen reports of my address at Exeter in the daily papers.

The two following letters from medical men show that the "medical conscience" is awake at home and in Canada in at least two men:

"Dear Sir,—I have only now been able to finish reading over the pamphlets you so kindly sent me, and it is a very pleasant surprise to me to find there are so many organizations, and such efforts in existence to endeavour to diminish smoking. I had not known of any of them, and it is especially satisfactory to know that they exist at Aldershot, as it is here, and at all recruiting depôts, that scientific proofs can be collected of the injury smoking entails on the heart, and therefore on all the organs of the body.

"Unfortunately a very serious drawback to any crusade against smoking is its very wide prevalence among medical men, who ought to know and hence act better; and this is always cited as a reason against its being harmful; and now that women are commencing to smoke, and to allow it in their sitting rooms and all over their houses, a potent restraint to men is being removed. I hope at all our medical meetings we may have a similar manly protest against it, as you made at Exeter; and that the future medical instructors at Training Colleges for school teachers will fairly, at all events, state the disadvantage of smoking or using tobacco.

"I smoked to keep away smell and infection when dissecting, and then continued it until, when in India, it and the warm climate made me so shaky and limp that I felt ashamed in the presence of native apothecaries and assistants, and then and there I gave up tobacco and alcohol, and soon I could do cataract or any other eye operation; and now I can enjoy all the varied perfumes of Nature and can at once detect injurious emanations.

"Again thanking you very much.—Yours truly, W. M. Harman, late Surgeon-Major Army. Winchester, August 18th, 1907."

"Toronto, Canada, September 4th, 1907.

"My dear Sir,—Permit me to congratulate you, the British Medical Association, and the Public on starting a crusade against the most costly, most health-destroying, most filthy and disgusting savage habit of modern civilisation—tobacco. During sixteen years, as editor of the *Canada Health Journal*, I did all I could to suppress the vile habit, regarding it as vastly more injurious to the constitution than alcoholic beverages, which to write the least came down to us from the highest, the Apostles and their Master; tobacco from the savages, up through the slums. It is a marvel that the profession takes to it so kindly. Again, with warm congratulations and hopes of good and abundant fruit from the new tobacco crusade, —I am, Sir, very truly yours, Edward Playter."

I wrote and thanked Dr. Playter for his letter, and I was obliged to inform him that he was under a false impression, as I had completely failed to persuade the executive of the British Medical Association to take any steps to promote efficient teaching as to the diseases caused by tobacco smoking, or to utter any manifesto to the public, as to the dangers of the habit. The following is a newspaper report of what transpired in the State Medicine section, when I read my address. I had barely ten minutes for the task, as the section was eager to catch an early train for a luncheon party at a distance. Several members treated the subject as a joke. The address was widely reported in the lay-papers, but was omitted from the *British Medical Journal*:

"The Use of Tobacco.

"Dr. Tidswell (Torquay) read a paper on 'The effect of tobacco smoking on the health of the individual and the nation.' He asserted that tobacco could not be defended on scientific grounds, and it was quite opposed to the laws of hygiene. He believed that no boy under twenty-one could escape injury from tobacco smoking. Animals and birds shunned tobacco. He advocated abstention from

smoking for two reasons—the first a selfish one, on the ground that the practice was injurious to health, and secondly, because they were interested in the rising generation. They wanted army and navy men of strong nerves, and legislators of sound judgment. He could not calculate the nicotine produced by the millions of pounds of tobacco smoked. He thought the easiest way of dealing with the difficulty was the formation of anti-smoking societies, and by that means boys and girls might be induced to pledge themselves not to smoke until the age of fifty years was reached. He had not been able to find anybody who could tell him of any benefit that accrued from the practice. He proceeded to give a long catalogue of diseases which he said were sometimes attributable to tobacco smoking. There was a close association between cancer of the tongue and smoking, and a much closer connection between the practice and insanity, much closer than many believed. He thought the Medical Association could assist in the guidance of public opinion by the appointment of lectures all over the Empire. The President said they all agreed with Dr. Tidiswell's remarks regarding juvenile smoking.

"A Different View.

"Dr. Drury (Halifax) said he had hoped to hear a little more argument against the moderate use of tobacco. There was a danger of extremists wanting to attribute all the diseases which troubled mankind to the particular matter which they took up. He understood that tobacco was discovered, or invented, by a Devonshire man, and thousands of men must have blessed him for it, but Dr. Tidswell seemed to dispute this fact, for on the back of the pamphlet issued by him appeared a suggestion that it was an invention of Satan. That was not quite sound. He claimed that it had been scientifically demonstrated that there were some virtues in tobacco. The fatal germ of tubercle was destroyed by the smoke of tobacco. If there was virtue such as that, surely it was not the dreadful thing they had heard that morning. After visiting the slums he often gave himself a good smoking, and he found that assisted him. Against smoking too early they all agreed, but there were many things which a man should do for which a boy should wait.

"Dr. McWalter (Dublin) expressed the belief that smoking prevented tuberculosis. When treating patients suffering from this, he found that among the young men who were about the age of twenty-two, the great majority were non-smokers. He thought that was rather remarkable. He admitted the evil effect on boys.

"Dr. Wynne (Leigh) thought it would be an irrational thing to cut themselves off from a thing simply because it was abused by some. He had seen hundreds of patients literally killed by excessive meat eating. He smoked as a boy, and had smoked excessively ever since, and had always enjoyed good health.

"The Chairman said it would be unfortunate if two statements made during the discussion were allowed to go out to the public as representing the scientific position. Dr. McWalter had said that in his experience many of the tuberculous patients that came under his notice did not smoke. It would be rather strange, of course, if there were not many more non-smokers than smokers at that early age, and unless Dr. McWalter had exact figures this claim must fail altogether as non-proven. As to the statement that tobacco had been proved to kill tubercle bacilli, that was most dangerous without explanation. It was what had happened under certain conditions. If three or more persons were imprisoned in a railway compartment with all the windows and other ventilation closed, the bacilli might be killed by the smoke from all, but the people themselves might be killed, because tobacco in a concentrated dose was an acute poison, and it only killed tubercle bacilli in such a concentrated dose. He pointed out that in public bars smoking was practised extensively, but bar servants suffered from pulmonary consumption more than any other class.

"Dr. Tidswell shortly reviewed the discussion, and said that many of his friends who smoked had fallen victims to phthisis. He was sure the connection between tobacco and cancer could not be treated as a joke."

I felt indignant at the apathy of the Association with regard to a habit which promotes disease and inefficiency, and I sent in my resignation and ceased to be a member. I consider inaction in such a matter amounts to blood-guiltiness and is a professional scandal.

How can the medical profession be militant or triumphant, when seventy per cent. of her members are indulging in the pleasures of narcotism and making their bodies unholy and filthy, and offering prayers which stink of tobacco? Is it not awful presumption for a nation, from the highest to the lowest, to prostitute itself by tobacco debauchery, and then profess to be servants of Jesus Christ—the preacher of righteousness, holiness, and purity. How can a man who is a slave to tobacco repeat the lines of that beautiful hymn?

"Abide with me from morn till eve,
For without Thee I cannot live:
Abide with me when night is nigh,
For without Thee I dare not die."

And yet I fear that many choir boys and other boys who sang these words with true joy in their early days have insensibly lost the desire to abide with Christ, owing to the action of a narcotic poison, paralysing the mental faculties, and creating a strong craving for tobacco which often kills the man's spiritual nature.

There are many smokers who require the comfort of a pipe during the night, and who are so selfish as to indulge their habit, to the annoyance of the wife, who cannot have pure air to breathe. Such a man may be said to look at his pipe as he goes to bed, saying, "Abide with me when night is nigh," and he dies with his pipe (and not his Bible) on the chair at his bed-side.

A very important medico-legal question arises as to the correct way of certifying the death of a man who has been an habitual smoker. If it is certain that the deceased has died from disease caused by the use of tobacco, or that disease was aggravated by it, then the duty of the doctor is to state the fact on the death certificate. I have only felt justified in one case in certifying death due to tobacco. A better plan would be to pass a law to compel the medical attendant to fill up a special form, stating whether the deceased had ever used tobacco, and if so, to what extent, specifying the number of years, and the nature and form in which it was used, whether cigarettes, cigars, pipe tobacco, chewing or snuffing. Such a fund of information, when published, might cause people to think seriously on the sin of self-intoxication.

No one would wish to see a true epitaph over the grave of a smoker in the following style:

SACRED TO THE MEMORY OF A. B.
WHO WAS BAPTIZED INTO THE CHURCH OF CHRIST,
WAS EDUCATED IN A CHRISTIAN SCHOOL.
HE JOINED THE NOBLE ARMY OF SMOKERS AT AN EARLY AGE,
AND CONTINUED TO SMOKE REGULARLY,
UNTIL DEATH ENDED ALL HIS EFFORTS AT THE AGE OF —
IT IS RECKONED THAT HE SMOKED AT THE RATE OF
OZS. A WEEK FOR YEARS,
AND ACCORDING TO THIS RECKONING,
HE USED OZS. OF TOBACCO DURING HIS LIFE.

I once attended an inveterate smoker during his last illness, and I felt grieved, for he had been a hard-working man, and probably had never been taught by his betters to avoid tobacco. Surely it is the duty of medical men to inform the whole nation that tobacco smoking is destroying the life, both moral and physical of the nation. I know of three things which a Christian man and woman should fear.

First . . . . . Infidelity.
Second . . . . . Tobacco.
Third . . . . . Alcohol.

These are the enemies of civilisation; they are dangerous enemies, but though they combine their forces with the king of hell, they cannot wreck the ship in which the Master of earth and heaven is resting at the helm.

I honestly believe that the majority of medical men view the habit of smoking with disapproval, but are too much engrossed in their particular duties to devote sufficient time to make a full enquiry as to the evil consequences. Perhaps some think that the habit is so deeply rooted that any attempt to check it would be useless and a waste of time. I know some men would not be convinced they were injuring themselves if an Archangel were to warn them, but some smokers are open to argument and to reason, and in justice they can demand our sympathy and help. In this matter of smoking it seems as if the profession as a whole had gone to sleep for half a century, and now finds that the habit is so popular and so universal,

that the best policy is not to make a great fuss lest an uproar and social revolt should arise.

If the habit were not dangerous to life we could adopt a neutral attitude in our public capacity, and content ourselves with advising our private patients, and hoping in course of time that the mass of the people would smoke less and less, and finally drop it entirely.

It is my opinion that the evil is so great as to constitute a national danger. Therefore I appeal to the patriotism of the members of our noble profession to go forward and help to educate the people.

Will not some of the Medical Societies undertake to give public lectures on health and training, with special reference to the abuse of alcohol and tobacco? I believe that those medical men who smoke are thereby unconsciously lessening their moral power and influence over their patients. We should remember that a patient is not merely an animal, but that he is a compound of the divine and human, and though the latter is the part which mostly needs our attention, we shall have more power to improve the body by working through the higher nature, that is the soul and mind. I believe that the greatest danger of smoking is the effect on the mind, acting through the nervous system. It has been frequently observed that the highest honours in schools and colleges are usually won by the non-smokers.

Men who smoke cigarettes are liable to frontal headache, loss of memory, loss of appetite and palpitation of the heart, also tremor of the hands and melancholia. Excessive smoking occasionally leads to acute homicidal mania, delirium tremens, or chronic insanity.

CHAPTER VII.

A LETTER FROM C. J. RUSSELL, M.D., DATED FROM CHRISTCHURCH, NEW ZEALAND, 1907, TO THE EDITOR OF *Beacon Light*, THE OFFICIAL ORGAN OF THE BRITISH ANTI-TOBACCO LEAGUE.

"DEAR SIR,—The literature you have been good enough to send me has arrived in good condition, and affords me satisfaction to state that it will assist me in my work here very much, and in many ways. It will give me much pleasure to accede to your request, and accept your kind invitation to co-operate with you, and do all in my power to remove this terrible menace to the best interests of the individual and the Empire.

"We seem to forget that a sound, healthy, well-developed physical organization is the only suitable casket to contain an active, vigorous, tenacious, well-balanced mind, brain, and nervous system. This (in the most exalted and refined degree) can only be attained by a careful, constant, and righteous regard for those natural laws which have been provided for the healthy development of all vital forces. These laws are unalterable, and of such an exacting nature, that any attempt to violate them brings its own punishment to both the mind and body.

"Most of the ills to which man is heir are creatures of his own voluntary creation, brought into being meditatively to satisfy the demands of some feature of his depraved selfishness and voracity, disposition for gain, or so-called personal pleasure and gratification. The tobacco and alcohol habits are two powerful illustrations of the position

above stated, and forcibly bring to mind those words of Scripture : ' These ! are thy Gods, O Israel.'

" Nations that we look upon as heathen or pagan have for centuries been watching our western methods of civilization ; they may have been slow to speak or write, but they have been swift to observe and to think ; they know much more of the nature of our virtues and vices than we give them credit for, and they have made such use of the former as to astonish us by the strides they have made in national progress, and the fears they have awakened in the minds of many as to the final results of awakening.

" Take, for illustration, China. It is reported on the best of authority, that the fiat has gone forth, that no officer or man in the army or navy will be allowed to smoke opium. The government has been made fully aware of the terrible consequences to the individual, and the danger and loss to the Empire ; therefore it has not only taken to set its house in order, but it has appealed to its neighbours to remove the temptation out of the way of health and progress. So much for China. But what has the English Government done ? Instead of remembering what strict discipline did at Trafalgar and Waterloo, it has relaxed healthy regard for the best interests of the forces, and minimised its influence on the masses of the people, to the danger and safety of the Empire. If our fighting generals and their men are to preserve the best form, steadiest of nerves, and clearness of brain, they will insist on perfect freedom from the influence of tobacco and strong drink. It is a painful statement to make, nevertheless true, that our present form of civilization is a retrogade one, every year bringing us under the influence of pernicious, demoralising, unnerving, prostrating habits, hurtful to the best interests of mankind, threatening the safety and integrity of the Empire, and materially discounting our influence for good upon other nations with whom we have to do.

" It is now nearly seventy-seven years since my eyes first beheld the light of day, more than fifty years of that time have been spent in the practice of my profession in one way or another ; and never during all those years, from my birth to the present time, has strong drink or tobacco been personally indulged in, or prescribed for any one of my patients ; and how medical men, ministers of religion,

ministers of state, masters of schools, and educated people (who from their educations and positions, must know the true nature of the two poisons, and their influence on the nation, and its social, moral, and political life) can indulge in, or lend their influence in support of, customs so foreign to the best interests of a common humanity, is to my mind most painful and inexplicible. O! when will we learn the simple lesson of self-preservation, and hand to the starving world the legitimate produce of the millions upon millions of acres of the very best land in the world, now devoted to the growth and material, to be consumed and destroyed in the manufacture of alcohol and tobacco in their various forms? What a stupendous problem for a professedly Christian and a progressive nation to contemplate, in all its bearings, on the individual, society, the state, and the world! When will simple wisdom, natural living, and loving humanity, mark our treatment of ourselves and our neighbours. The more one thinks, the greater is the desire to express one's thoughts, but my words must have an end.—(Signed) C. J. Russell."

Memoir.

Charles James Russell, M.D., was born in the United States of America, February 25th, 1830, remained at home with his mother (his father having died when his son was nine months old), who was a godly woman, fully alive to the many rocks and shoals so often met with while navigating the ocean of life, and took great care in teaching her only charge to box well his compass, and hold fast the tiller in all kinds of weather.

At four and a half years of age he became a Sabbath School scholar, and a member of the Juvenile Temperance Society (connected with the Sunday School), which held its meeting on the first Monday in every month. At those meetings all kinds of alcoholic drinks, and the use of tobacco in any and every form were denounced; and they were taught that a simple life was the most conducive to health, longevity and success in fighting the battle of life.

Dr. Russell having, during the whole of his life, adhered most strictly to those early teachings, is one of the few octogenarians who have lived a strenuous life, and been true to his convictions. One peculiar feature in the Doctor's early life, was his fondness for the company of

aged people, from whom he could learn much, and to whom he could impart much pleasure by reading aloud to them.

From a very early period in his child-life, he was taught that change of occupation was recreation, and he found it a noble lesson, and opened to his mind new fields of interest and profit, and most perfectly solved the problem of "nothing-to-do"; for every occupation brought with it a burning desire to undertake some new subject, included in the catalogue of "always do something," and always let that something be something good and something well done.

At the age of sixteen he began to read medicine, left the Bible Class for the teacher's chair and social work; at the same time, continued those studies necessary to enable him to reach the higher standard required for his medical education, the profession of his choice. But, he states, he was not long in learning that the medical profession brought him in close contact and relation to the inner social life of all classes of society, and that to be a successful physician and surgeon he must study the nature of every social problem that would in any way influence his success as a medical man, a citizen, and a philanthropist. On a close investigation of these problems he found, from his standpoint, that the medical practitioner held a most unique position in society. First at the birth of life, and last at the ebb and end of the vital forces, he could look along the tortuous way of life and find something at every crook and turn to engage his attention, something to do for his patients, for the community in which he lived, and as much for his King and Country.

Having finished his course of study, and five years as an assistant to two eminent medical men, where large opportunities were afforded him to acquire a practical knowledge of his profession, and spending years in walking three different hospitals—one in America, one in Scotland, and one in France (the Hotel Dieu Paris),—he took minor degrees in Scotland in 1848, and the M.D. in America in 1876. Since 1876 he has conducted his professional and social work at the same time, feeling that as society is at present constituted, they are inseparable. The Doctor is a popular public speaker; hundreds of thousands have listened to his addresses on many phases of the many social questions that are engaging the attention of the public mind. On one occasion it is said that in an audience

of 3,000, nearly 400 took the Total Abstinence Pledge. He has assisted in the conduct of a number of missions against strong drink, tobacco, and every form of gambling, in America, Canada, England, Scotland, France, Australia, and New Zealand. He was one of the five medical men who first formed the British Medical Temperance Association in London; was one of the six medical men selected to speak in Exeter Hall, London, on "the Medical Aspect of the Temperance Question," and took an active part in the debate at the breakfast tendered to the members of the British Medical Association, when in session at Sheffield. The Doctor also read a most interesting paper on narcotics before the British Anti-Tobacco, and Anti-Narcotic League at Manchester, of which he was then, *and is now* a member. He was a member of the Grand Lodge of the I.O.G.T., and held office in that body, and still continues a Good Templar in New Zealand; and a year ago he was made a member of the Royal Society of Arts, London, founded 1754.

In 1880 the Doctor removed to New Zealand, where he still conducts a large practice, and spends much time in delivering courses of lectures on health and kindred subjects, which are largely attended and highly appreciated. He is patron, vice-patron, president, vice-president, chairman, councillor, or member of more than thirty associations and societies, and a few weeks ago he was elected by an unusually large majority, to a seat on the Board of Education for the Central District of North Canterbury. The Doctor is looked upon as a genial, liberal, good-hearted philanthropist, proud to be identified with every phase of true social reform. He has the courage of his belief, and is not afraid to give expession to his convictions, and treats the most delicate social questions in a most lucid and pleasant manner, and in such a way as to give no offence to the most fastidious. He has just ordered 25,000 tracts and literature, upon the evils of alcoholic drinks and tobacco, for free circulation through the city and suburbs of Christchurch; this looks very much like "good business," and I wish him, his friends, and their noble work, every success.

I am informed that notwithstanding his advanced age (81 years), he works night and day professionally as well as socially, has his five senses almost perfect, and his work

is a pleasure to him, and is so varied as to furnish pleasing, healthy recreation, requiring no holiday travels in search of health ; and this happy and enviable position he states is due to his life long abstinence from strong drink and tobacco, as well as care for his bodily condition.

CHAPTER VIII.

THE EVILS OF TOBACCO SMOKING IN FRANCE. LETTER FROM DR. HALL. THE ACTION OF TOBACCO ON THE NERVOUS SYSTEM AND THE HEART. THE OPINIONS OF FRENCH, ENGLISH, AND AMERICAN PHYSICIANS. MALINGERING IN THE ARMY. EFFECTS OF TOBACCO ON SOLDIERS AND SAILORS.

THE evils of Tobacco smoking have been fully recognised by certain members of the medical profession in France, who have issued a useful magazine for the last thirty-five years, describing the diseases caused thereby. This society offered a prize of one thousand francs for the best essay on the effects of tobacco on the health of men of letters and its influence on the future of French literature. Dr. Fleury gained the prize. At the time he wrote his essay he was a smoker. Soon after, he found himself suffering from dyspepsia, which he attributed to tobacco, so he wisely gave up smoking and soon got rid of dyspepsia. He has written a most interesting book, called "Medicine and the Mind," from which I have taken the following extracts:

Victor Hugo considers smoking injurious to the intellect; he said, "thought became reverie." One author stated, "the cigarette is only dreaming and resignation, a deadly pastime, completely useless." Another wrote, "tobacco changes manly projects into reverie." Dumas wrote, "I gave up tobacco when I found it caused me giddiness." "In my belief tobacco with alcohol is the most formidable adversary of intellect." J. Barbier wrote, "I have been a great smoker, and I narrowly escaped paying for that deplorable and delicious habit with my

life. By degrees the beating of the heart became irregular, a few more cigars and it would have stopped. The elimination of the nicotine was slow, it took more than a year to get rid of its effects." One writer said he had brought on angina pectoris by smoking, and that soon after he ceased smoking he recovered. Another author wrote, "I am not a doctor; all I can tell you is that after having smoked for forty years I had to renounce that pleasant intoxication which was leading me too fast to the grave." Another wrote, "I was in fact a great smoker, and I found it hard to renounce tobacco. But I was absolutely constrained to do so, some years ago, by the increase of certain nervous complications, which I had for a long time refused to attribute to nicotine, and which in reality had no other cause. I was forced to yield to a conviction of the truth when these nervous affections, gastric vertigo among the number, became more frequent and intolerable." Dr. Fleury considers many clever men have been hindered in their literary work through the effects of nicotine. I believe Dr. Fleury is right in his opinions. I regard frequent inhalations of nicotine as having the power to decrease mental efficiency. The brain is directly injured by the blood, which is poisoned by the slightest taint of nicotine, and the whole nervous system is affected. Dr. Fleury was not a bigot, he was a smoker until he began to suffer in health, and when he found tobacco was poisoning his blood he wisely gave it up. After a full enquiry about the work accomplished by smokers and non-smokers, he came to the conclusion that the latter accomplished far better work than the former. As examples of fine intellects among non-smokers, he mentions Goethe the German poet, Victor Hugo, Balzac, Michelet, and Dumas the elder.

I will now take leave of Dr. Fleury, wishing his book may be the means of spreading a desire to know the real effects of tobacco among all civilized people.

I will now introduce the reader to an American physician, Dr. W. S. Hall, M.D., a professor of physiology. He has written a personal letter to young men which was published in the *School Physiology Journal*. It begins thus: "There are two reasons why I feel justified in addressing to the young men of our great Republic a personal letter upon the subject of tobacco. In the first place, I have

been associated with young men for many years in several institutions of learning, and have come to know the young American in general and several thousands of them in particular. In the second place, I have had personal experience of tobacco, and am very familiar with its effects upon the system, from having experienced all of its pleasures and many of its objectionable features. My readers will pardon me if I detail to them some of my experiences with tobacco.

"Beginning in my twenty-fifth year, while a medical student, I smoked one cigar daily for a period of about two years. I have always studied my own physical and mental conditions, and began to observe the effect of tobacco upon me. I came to notice from day to day that during the smoking of the cigar there was a perceptible change of mental attitude toward my work and toward things in general. I would begin a cigar with mind all alert, ambitious to get at some work that needed to be done. After a half-hour of watching the smoke curl up toward the ceiling, I was conscious of a falling off of mental activity, and unless the work was imperative, I usually ended up by taking a stroll down Michigan Avenue, to be entertained by a glimpse of its equipages and people. I was conscious of a sort of "don't care" mental attitude toward things in general. I have never for a moment doubted that my change of mental attitude was to be attributed solely to the effects of the nicotine. I believe, in the light of subsequent observation, that it is just this effect of tobacco which makes it especially pleasing to people. If I failed to have my after dinner cigar, I missed it so much that I woke up to the fact that I was slowly, but surely forming a drug habit, and through my medical studies I knew that a drug habit, whether for morphine, cocaine, alcohol, or other narcotic or stimulant, is harmful to the system in direct proportion to its use, and I knew that, without exception, all of these drugs enslave a person by gradually undermining his will power; the more one takes the less he is able to stop. When I realized the situation I stopped."

It seems clear to me that Dr. Hall's experiment proved the truth of Dr. Fleury's conclusion that the "nicotine poisoning turns manly projects into reverie and promotes

idle dreams." I use the word "nicotine poisoning" advisedly, because, speaking strictly in a medical sense, whatever degree of pleasure is derived from the effects of tobacco smoking must be a symptom of poisoning. The lethargy, the stupor, and the desire for bodily ease, as indicated by the fondness for the sofa or the arm chair, are merely symptoms of mild narcotic poisoning. This form of self-indulgence is not only injurious to the intellect, as Dr. Fleury and others have so clearly demonstrated, but it also decreases moral power and diminishes self-control. Is not the boy smoker more liable to the habit of masturbation than others? Is not the smoker of eighteen or twenty-one years of age more likely to get a girl into trouble than others? Can the smoker control all the passions, such as jealousy, anger, revenge, etc., as well as others? Is it not possible that careful enquiry into the history of many criminals would prove that the crimes were committed while they were under the influence of nicotine?

It has been stated that quite eighty per cent. of the 15,000 youths who are detained to-day in the prisons, reformatories, or industrial schools of the London district are cigarette smokers.

The head-master of a Glasgow elementary school stated he had seen many cases of frequent sickness and moral weakness from cigarette smoking. He had succeeded in curing the beginners, but others were incurable. Here are particulars of two boys:

(1st) "Frequently sick, lazy, gets more backward in his work every day, impossible to get him to remember his lessons. Says he has tried to stop smoking but cannot."

(2nd) "This boy before smoking was of average intelligence. The change in him has been very noticeable day by day. He cannot fix his attention on anything for more than two or three moments, from morning to night he seems to be in a state of lethargy."

Many employers of labour refuse to engage boys who smoke. Many juvenile smokers have been guilty of stealing cigarettes and other things. School teachers, and all those who have charge of boys, declare that smoking prevents boys making progress in their studies and renders them unable to excel in athletics. Moreover,

their conduct is usually unsatisfactory, and they grow up to be idle and dissolute and often dishonest.

I recently heard of a gentleman of considerable ability, who had distinguished himself at one of the Universities, who smoked to excess and gradually lost his self-respect and that of his friends. Ultimately he wandered about the country and became a tramp. Poison, absorbed day by day for many years, weakened his intellect, until there was no trace of the original man.

The present age is anxious for an improvement in health. The majority of thoughtful people have become alarmed at the spread of nervous disorders and other signs of degeneration in our midst. Who can count the number of men who have paid an awful penalty for their love of tobacco? How many men have become insane through tobacco? God only knows! How many women have been driven mad by the cruelty of their husbands who loved their pipes and beer better than their wives and children?

There can be no doubt that smoking tobacco causes loss of nervous energy and leads to many serious diseases. Its effect on the heart is known to all practitioners. Cases of painful palpitation from cigarette smoking are common among men, women, and boys.

A gentleman in this town, who is under thirty years of age, smoked for some years, and then he found his wind was getting short, he then stopped smoking and he recovered.

An extract from Dr. Clifford Allbut's System of Medicine may interest my readers; he writes as follows: "Cardiac irregularity is a frequent consequence of tobacco smoking, lagging and intermission being the earlier forms of it. One case is known to me of a man whose health is excellent, who is by no means a neurotic subject, and whose heart stands work well in all other respects, in whom intermittence of the heart may occur for many days if he remain for an hour or two in a room with many smokers. He dare not sit in the smoking room of his club, or in the smoking compartment of a railway carriage. The intermittence may not begin till the next day, but then it comes on with the certainty of a laboratory experiment. It gets worse during the next day or two and then gradually passes off in a few more days. He never suffers from any

cardiac disorder, unless exposed to tobacco fumes, but this proclivity has hung about him for many years. Tobacco is said to affect the nerves of the heart only and not its muscle, but a long experience of such functional derangements in this vital organ has led me to the opinion that ultimately such hearts come to no good. Tobacco certainly leads to anæmia. In my opinion, he who habitually poisons the structures of his heart, is on the way to dilate it."

It is a fact that men who lead active lives and are of a robust constitution, and who do not drink to excess, may smoke tobacco habitually for many years without any greater suffering than occasional attacks of dyspepsia or palpitation of the heart. This immunity may continue to the age of fifty or sixty, and therefore they feel quite sure smoking is not injurious to health, and they are not backward in talking of their achievements, hence they spread a belief among young boys that tobacco must be a boon to mankind.

Physiologists are aware that various functions are not so easily performed as people advance in years, for example, the processes of digestion are less perfect, and the action of the kidneys and skin, whereby the products of tobacco are eliminated, are more easily checked by sudden changes of weather. Hence after middle life there is a great danger of these poisonous products being retained in the system until, without warning, alarming symptoms of poisoning suddenly occur. A man may feel well on rising from bed, and may start for business as usual; he may incur some unusual exertion or some unexpected worry; the heart flutters and he falls to the ground without any warning. Sudden death from sudden failure of the heart, associated with fatty degeneration, is not uncommon among plethoric men over fifty years of age.

I will now relate a remarkable case published by an American doctor. "He was consulted one day by a clergyman, aged fifty; he confessed he had been a great smoker, and for the last month his mind had been greatly impressed with his sin and shame, and he had sought to abandon it. He determined to enter his church on Sunday free from his usual indulgence. On rising to open the Church Service he found himself blind and

unable to articulate. He almost fell down; he was taken home; when his doctor arrived the patient said, 'you need not be troubled, just hand me my tobacco box and I shall be well in two minutes, this is simply a reaction of my nervous system, consequent upon abstinence from my usual indulgence;' he took a chew and slowly recovered. A few weeks later he died from heart disease."

Some superstitions die hard. I would gladly make a personal sacrifice to help my fellow creatures to avoid a habit that survives under a false reputation of being a peace-maker. Has it ever been proved by diplomatists to act as a peace-maker between nations? Has it ever prevented litigation? Has it cemented the marriage bond, and lessened the number of divorce cases? Has it promoted peace and goodwill between capital and labour? Has it promoted peace between the rival political parties in Great Britain? Has it promoted peace between the rival religious bodies in Christendom? Did it prevent war between the northern and southern States of America, or between Great Britain and the Boers? I can understand unlettered and ignorant men taking up the habit, but I quite fail to understand how men of science can be so deluded as to imagine they can procure comfort and ease by inhaling tobacco smoke.

Cases of Malingering and Illness in the Army and Navy caused by Tobacco.

The following statement has been made by my friend, Mr. Colbeck, who served in the Army 1859-1882:

"When a young soldier I found that there were a large number of bad characters in the Service, and that a number of these were constantly in hospital, thus bringing extra duties upon their comrades; and on enquiry I was informed by old soldiers that most of 'the Queen's bad bargains' were upon the sick list, that they were malingerers, in fact were dosing themselves by swallowing tobacco and pills made of soap; also by tying copper coins on sores made by themselves; and that they were generally successful in their dodges to obtain their discharge from the regiment as medically unfit. This was at the time when bounties were given to men on their enlistment. I well recollect the detection of a malingerer, he was tried by Court Martial, when it was proved that he

had been in four different regiments, from each of which he was invalided as unfit. He received a lengthened term of imprisonment with fifty lashes at the triangles."

Health of the Army in 1907.

"The Report of the Army Medical Department has a particular interest this year, as it is the first report to be run on new lines. The Chapter on Invaliding has this to say, 'disordered action of the heart is a fruitful source of invaliding amongst young soldiers. There is a fairly general concensus of opinion, that this disability is due partly to a defective and too hurriedly forced system of physical training of immature and often ill fed lads, and partly to the obnoxious habit of smoking.'"—*Morning Leader*, Nov. 28th, 1907.

The Surgeon General of the United States Navy has recommended in his last Annual Report, that an order be issued by the Navy Department, forbidding the use of cigarettes by all persons in the Navy under twenty-one years of age.

I was told by an English officer who went through the whole of the last Boer war, that his men occasionally suffered from thirst while on the march to such an extent, that they could not resist drinking from dirty pools of water. It is my opinion that the smoking habit itself produces thirst, and I think it probable that the men would not have suffered in this way had they been non-smokers. By drinking dirty water they contracted enteric fever. By smoking tobacco they created an unnatural thirst. I have been told that some men used to smoke over an ounce of tobacco a day.

A Warning to Sailors.

One of the Naval medical reports contains the following: "A sailor boy had been frequently punished for chewing tobacco. He had often suffered from debility, giddiness, and headache, which were traced to the poisonous effects of this substance. On two occasions he had swallowed a piece he was in the act of chewing in order to escape detection. On the night of his death he went to his hammock, telling his messmates that he felt sick. About ten minutes afterwards the occupant of the next hammock heard him breathe stertorously, and immediately tried to

waken him ; he could not succeed, and when the surgeon came, he found him to be moribund. The pupils were insensible to the influence of light, and the pulse, which was scarcely perceptible, ceased to beat after an interval of three minutes. On a post-mortem examination, two small pieces of tobacco were found in his stomach."—*v. British Medical Journal*, Nov. 1st, 1873. Let sailors take warning from the fate of this young man.

An Army pensioner has lately informed me, that he has been a non-smoker all his life, as had been his father and his grandfather, that, although most of the soldiers smoked when he was in the regiment, he never hankered (sic) after "the weed," saw no good to come from the pipe, and that its use certainly incurred an expense which ended in smoke. When on active service in the Field (the Zulu War and the Transvaal, 1878-1879), he observed while on the march, that when a "halt" was ordered, there was an immediate rush to the river banks or to pools for drinks of water, and he could not help but notice the fact that these rushes were made by the smokers, and rarely by the non-smokers ; this occurred at every halt, and he therefore came to the conclusion that such inextinguishable thirst arose from "dry throats," certainly caused by tobacco. He added : Some of the pools at which the men drank were certainly very far indeed from being clean or free from insects. One pool, he recollects, had the carcase of a dead bullock partly submerged in it. The Officers, both commissioned and non-commissioned, did their utmost to restrain the men from drinking such foul water, pointing out the danger, probable results, etc., but the intense thirst had to be, and was assuaged as he has stated.

A True Anecdote, how a Soldier obtained his discharge from the Army by the help of One Pipe of Tobacco.

Many years ago the soldiers in a regiment were informed that they were all to be examined by the medical officer to see if all were fit for active service. As the time approached for the examination, one of the men set to work to smoke a pipe, and he smoked vigorously until he was called forward. The doctor discovered that his heart was acting irregularly and quicker than should be in health,

and, under the impression that the man was unfit for active service, he ordered his discharge. This anecdote is true ; it shows that this soldier was familiar with the action of tobacco on his heart, for he timed the experiment to produce its full effect at the time he was under examination. He said he knew of others who obtained their discharge by the same means.

The aggregate consumption of tobacco in England and Wales, from 1702 to 1709, was 11,260,659 lbs. a year.

We can trace the growth of this habit from one generation to another, making slaves of free-born Britons, causing thirst and disease of various forms, causing poverty and shortening life, promoting paralysis and insanity. A habit fostered by the professors of divinity, law, and medicine, regardless of the warnings of numerous medical men and others who desired to preserve their fellow creatures from acquiring the worst of all drug habits, the smoking of tobacco.

It is an alarming fact that the tobacco consumed in the year 1908 contained 2,700,810 lbs. of nicotine. Surely there is cause for wonder and gratitude that we have not been wiped out as a nation, when we remember that five drops of nicotine introduced to the mouth of a man will cause sudden death.

CHAPTER IX.

Twenty-four Cases of Tobacco Poisoning.

The true aim of the medical profession is to promote Hygiene. No medical writers of the present day recommend the habit of smoking; but all those who refer to it are compelled to admit it leads to sickness and disease, and affects the moral nature of man besides the physical nature. The evil effects of inhaling nicotine vapour through the nose and lungs are well known. The smoking of tobacco in badly ventilated rooms and in houses is far more injurious than smoking in the open air, because in the former case the atmosphere becomes highly charged with carbon monoxide gas, which takes the place of oxygen. Hence, the atmosphere does not contain the proper proportion of oxygen, and those who inspire the atmosphere, starve their blood of oxygen and introduce carbon monoxide into the hæmoglobin of the blood.

Directly a poisonous atmosphere is inhaled into the mouth and lungs, the blood becomes poisoned. The process of oxidation is impeded owing to the presence of poisons in the hæmoglobin of the red corpuscles of the blood. The blood is the source of all our vital forces, and we require an abundance of pure air to preserve the purity of the blood. The lungs are the organs by which oxygen is conveyed to the blood and by which impure gases are eliminated from the blood. The lungs are like sponges to a certain extent, because they absorb whatever gases come in contact with their lining membranes. They absorb foul air as readily as pure air. The person who is placed in an atmosphere of tobacco smoke cannot avoid breathing the poisonous gases present in the air. It is certainly

morally wrong for one person to poison the air which other people are obliged to breathe, but, unfortunately, smokers are often forgetful of the rights of other people.

In consequence of the frequency with which the smoking of tobacco is associated with the abuse of alcohol, the symptoms of tobacco poisoning, which are insidious, are often overlooked, or are attributed to other causes, such as gout, rheumatism, over pressure of work, or the abuse of alcohol. It is easy to trace the connection between an over dose of alcohol and the disturbance which follows, but the action of tobacco is slower and more insidious, and it often happens that a certain toleration becomes established, which means that the various organs perform their functions well enough to persuade the smoker that "all is well," and that he can smoke without harm. The truth is that the loss of one per cent. of vital energy every few months escapes observation. As the amount of tobacco smoked increases, there will consequently be a progressive loss of vigour from year to year, which may be apparent to every one but the smoker. Tobacco often deceives the user into a false sense of security. No part of the body can escape a poison that is circulating in the blood day and night. The nervous system suffers and the muscles become tremulous. But the heart is the chief sufferer in the beginner and the confirmed smoker.

Notes on Cases of Disease caused by Tobacco.

Case 1.—A man, age 55, who was an abstainer from alcohol and a steady man, living wisely in all respects, except that he smoked and chewed tobacco, came to see me on January 27th, 1908. He had been at work until two days ago, when he fell ill. At first he vomited and felt pains in the back. I found the pulse weak, 128, he was shaky and unfit for work. I put him on his club and gave him medicine. He came again on February 3rd, heart sounds were feeble, pharynx injected, urine thick. He promised to give up smoking. On February 5th, after walking one mile, the pulse was 112, he complained of weakness in legs, vertigo, palpitation, and nausea. It was evident he was suffering from mild influenza, plus chronic tobacco poisoning; he remained under treatment for three months, abstaining entirely from tobacco. The heart gradually recovered its tone. On April 29th pulse was 96; he

returned to work in May. In June he was doing well pulse 88, cord-like.

Case 2.—In November, 1905, I was consulted by a man, age 28, a mechanic, he was very pale, his eyes were dull and restless, tongue red, his expression was sad, his hands were tremulous, he complained of loss of memory and inability to calculate figures, etc., he said he had never tasted alcoholic drinks, he was in the habit of smoking half-a-pound of ship tobacco in a week. I urged him to reduce the quantity, he admitted that my advice was right, but expressed a fear that he could not overcome the craving, nor has he done so yet.

Case 3.—On January 11th, 1908, a man, age 54, fell ill and was obliged to rest in bed. He was formerly in the Royal Navy, he had been in regular work and never drank to excess, he had been smoking half-an-ounce of ship tobacco a day for many years, he was fat and pale, heart sounds feeble, impulse feeble, he suffered from pains in the arms and shoulders. On January 16th he was no better. On January 21st, tongue was coated brown, the systolic sound was short and feeble, and the second sound feeble, pulse irregular. He was suffering from influenza, complicated with a "tobacco heart." His illness was of a catarrhal nature and resembled mild influenza, and might have been thrown off in three days if his blood had been free from the poison of tobacco. His disability lasted over three weeks.

Case 4.—A young man of healthy appearance, age 25, a carpenter, came to see me, saying he had recently fainted in the early morning, immediately after rising from bed. This happened twice within a short time. I found no sign of disease, and on questioning him as to his habits I found he was a cigarette smoker. I advised him to break off the habit. Such cases as this occur to most practitioners, and they prove that the heart is liable to serious disturbance, even in strong men. This man took my advice and has since been in good health.

Case 5.—In October, 1906, I attended an old man who had smoked one ounce of tobacco daily for many years, he suffered from chronic heart disease, associated with a weak pulse that was usually 130, he died at the age of 72 from want of digestive power and gradual heart failure. He had the symptoms of fatty degeneration of the heart.

Case 6.—I first examined this patient four years ago, he was then 31, a tall man. He began to smoke at 17; he entered the Marines; he enjoyed good health for many years. At the age of 30 he was discharged from the Service on account of heart disease; he was told by the doctors that he would not live long. After a period of rest he improved, and was able to do light work for several years. I found he was suffering from hypertrophy of the left ventricle, with a loud mitral bruit. The compensation was efficient and he did not suffer much inconvenience. I advised him to stop smoking and drinking, but he preferred to follow his inclinations. Two years later he had trouble and attempted suicide. Three months ago he had severe influenza which brought on locomotor ataxy and an increase in dilatation of the heart, producing general dropsy. This case appears to be entirely due to tobacco poisoning, as the man had no illness and was never injured by over-work.

Case 7.—This man is now 58 years of age. He entered the Navy in his youth; he had fever on the West Coast of Africa. After four years service, he was invalided home. He was a patient in the Naval Hospital for a long period for incipient phthisis. While in the Navy, he used to smoke 4 ozs. a week. While in the hospital, he was allowed to smoke as much as he liked. At the time he did not suspect his illness was the result of tobacco smoking. For several years after his discharge he suffered from chronic cough, and was able to earn his living as a porter. He then married, and had a family. He used to drink to excess sometimes, up to the age of 38. One day he was running up steps, when he suddenly turned faint; a doctor saw him, and diagnosed dilatation of the heart. From that time, he gave up alcohol and tobacco. He slowly recovered his health, and returned to work. Four years ago he had asthma and bronchitis, and was laid up several weeks; since then he has wheeled a barrow with vegetables up and down the hills of Torquay. He has one son and three daughters. He began to recover health when he gave up alcohol and tobacco.

Case 8.—Marasmus and anæmia in a young man, caused by smoking.

R. B. was the son of a man described as Case 21, Chapter II. in this book. I took his history on 14th July, 1910, he was 27; his father and paternal grandfather died of

phthisis. He began to smoke cigarettes while at school, he never cared for athletics. In boyhood, he often had bleeding from the nose. The cigarette habit had got firm hold of him by the age of 18. At that age he began to work as a labourer, and soon after he suffered from fits; his doctor advised him to stop smoking, but he did not heed him.

At the age of 22 he was unfit for work, owing to pains in the chest and shortness of breath. From that time he did nothing but eat, sleep, and smoke "fags," he had no liking for beer or spirits; he was content to sit by the fire and smoke, and read the sporting papers.

During the fits he lay quiet until he recovered, except for a slight quiver of the mouth. His loss of strength and vigour was gradual. Present condition (July 14th), eyes are dull and lifeless; the face of a greenish yellow colour, the body is the same colour; cheeks sunken, body emaciated. He has a vacant expression, and appears indifferent to all things. He has now become obstinate, he refuses to put on a clean shirt, and refuses to go to bed; he has not eaten food for several days; he answered my questions in a vacant way; he seemed in a constant dream; he spat up frothy fluid from his stomach; gums soft and swollen, tongue yellow. The following day I was sent for and found him in a fit; he went off quietly while seated in a chair.

On my arrival, he appeared lifeless and motionless; respirations were not perceptible, the only sign of life was the pulse, which was regular. As he recovered, he was asked to drink some brandy and water, but he refused saying, "What good is brandy to me." I examined his chest, and found shallow respiration, but no evidence of tubercular disease; body greatly emaciated.

He remained in bed from that time till his death; he never asked for a cigarette again; he tried to take food, but his stomach was in a state of catarrh. From that time, his mind improved, and he was docile, and took his medicine; his gums were swollen and painful. He slept a good deal.

July 15. Pulse bounding 96, no cough, no spitting or eructation, unable to take food and very weak.

July 16. Weaker.

July 18. Had a fit, and was unconscious for half an hour, occasional vomiting and diarrhœa.

July 19. Weaker. Pulse 120, Temp. 102°.

,, 20. Mind wanders.

,, 21. Temp. 103·4°.

,, 31. He died.

There is no doubt the blood was in a diseased condition from constant inhaling of cigarette smoke. His first medical attendant associated the fits with tobacco, and advised him to stop smoking. He was not subject to fits in infancy, and if he had avoided tobacco he might have enjoyed good health. I certified his death as due to "Wasting and Atrophy from cigarette smoking."

Case 9.—A naval pensioner, age 63, has smoked to excess for many years. Never had an acute illness; he has gradually become prematurely decayed, his tissues are atrophied, face shrunken, eyes dull, back feeble and bent; all his limbs are tremulous—too feeble to walk. There is an indolent ulcer on the nose that never heals; it forms a dry scab, which is renewed from time to time. At the age of 64 he had a severe apoplectic fit and died.

Case 10.—The following case will show the close connection between smoking and cancer, and also the danger of breathing an atmosphere of tobacco smoke. It is my opinion that excessive smoking on the part of a male parent will cause congenital debility in his offspring. I will relate a case in point, and I have no hesitation in stating that the children inherited weak constitutions from their father, because the mother had a sound constitution, and is still in the enjoyment of good health.

The father was a business man who lived near London and went into the City on business every day. He became a heavy smoker; his wife bore three sons and two daughters. The eldest son caught diphtheria at the age of 4 and died in a few days. The second son joined the volunteers, and contracted enteric fever and died. The father developed cancer of the rectum, and was confined to the house; he used to smoke day and night to lull the pain; his youngest son used to sit in the same room with him, and began to suffer in his throat from the irritation of the tobacco smoke. In a short time he developed

tubercular disease of the lungs and died. The father died a painful death from cancer of the rectum.

There is no doubt in my mind that smokers are more liable to cancer than others; it is also my opinion that the only women who suffer from cancer are the wives or daughters of men who have indulged to excess in tobacco. The youngest son of this gentleman spent much of his time in the room where his father used to smoke. Does not tobacco smoke set up irritation in the throat and lungs and often lead to consumption?

Case 11.—Reported in the Rochester paper, August 17th, 1907. "An inquest was held at the Military Hospital, Sheerness, before Mr. C. B. Harris, County Coroner, on A. B. Howels, aged 29 years, a sapper in the Royal Engineers. On Sunday night deceased was in the cook-house cleaning the floor. All of a sudden, he said, 'Good God!' and fell forward on the broom he was using. He gasped two or three times and expired. The deceased was an excessive smoker of cigarettes, and Dr. Vincent Legge told the coroner and jury that this had possibly affected the heart. The jury returned a verdict that death was due to sudden heart failure."

Case 12.—Reported in the *Sheffield Telegraph*, November 4, 1907.—"John Cairns, a fitters' labourer, 23, although warned by his doctor that cigarette smoking was doing him serious physical harm, was such a slave to the habit that he only desisted from the excess for a few days. While he was hurrying to fetch a doctor to attend his sister he fell dead in the street. At the inquest the jury's verdict was based on the medical opinion that death was immediately due to violent emotional excitement, aggravated by excessive cigarette smoking."

Case 13.—Reported in the *Liverpool Post*, November 12, 1907. "At Lytham, yesterday, Tom Smith, about 36 years of age, tripe dealer, had just finished his dinner of fish and potatoes, when he complained of feeling sick. He sat on the couch and died immediately. He was an inveterate smoker of cigarettes, and had been warned to give up the practice by a doctor as recently as last week."

Case 14.—Reported in the *Daily Express*, May 5, 1906. "A coroner's jury decided at Gilmorton, near Lutterworth, yesterday, that the death from syncope on the previous

day of Henry Wolfe, at the age of 17, was brought on by excessive cigarette smoking."

Case 15.—Insanity caused by cigarette smoking. "It was the cigarettes drove my boy mad. He never drank, he used no drugs, his habits were in other respects good." This statement was recently made in a continental city by the father of the boy, who was adjudged insane. For the past year he had done no work, but sat by the hour smoking and reading.

Case 16.—Reported in the *Whitby Gazette:* "At an inquest at Hull, J. Prickett, 14, fell down in the street and died before he could be taken into the infirmary. The mother said he was a heavy smoker of cigarettes, and had commenced at the age of ten or earlier. Dr. Smith, house surgeon at the infirmary, said the heart of the deceased showed disease of the aortic valve, and death was due to heart failure." The jury found that the boy died from "natural causes." Who will explain the meaning of this verdict? The true verdict should have been "Death directly or indirectly caused or aggravated by tobacco poisoning."—H. H. T.

Case 17.—Reported from Shrewsbury: "An extraordinary case, demonstrating the dangers of cigarette smoking has occurred at Shrewsbury. A boy, age 14, smoked two cigarettes on his way to work and swallowed the smoke to escape detection. The boy was taken ill at the workshop and was induced to lie down. A short time afterwards he lost the use of all his limbs and the body became quite cold. Medical aid was summoned, and the lad was found to be suffering from heart failure."

Case 18.—Reported in a newspaper as follows:

"Death of a Jockey by the Road-side.

"Some sensation was caused at Alfreston by the discovery of the body of Henry Lee, 27, a jockey, by the side of the road, and at the inquest which was held, evidence was given which gave rise to comments on the evils of cigarette smoking. Mr. Taylor said that the deceased lodged at his house, he never knew anything wrong with his heart, he was a great smoker. Mr. Wallis, a medical practitioner, said he made a post-mortem examination of the deceased and found that the cause of death was syncope from

natural causes. Inside the stomach he found a beach stone. The syncope might have been brought on by excessive smoking. The jury returned a verdict in accordance with the medical testimony.

Case 19.—Reported in a newspaper: "A schoolboy at Halifax, aged 11, died recently, and the verdict of the coroner's jury was 'poisoned by nicotine.' After smoking several cigarettes on Saturday afternoon, he became sick on Sunday, and died on Monday after partial paralysis had set in."

Case 20.—Reported in the *Dundee Telegraph*, February 4th, 1908.

"Sudden Death at Kircaldy.

"A boy seven years old has died very suddenly after sickness. Medical aid was summoned when the boy became ill, and the doctor stated that death was due to 'cigarette smoking.'"

Case 21.—Reported in the *News of the World*, December 23rd, 1906.

"Boys killed by Smoking.

"Sensational statements of the growing evil of cigarette smoking amongst schoolboys were made at a meeting of the South Shields Education Committee. It was reported that a scholar named Wood, age 12, had died, and that his illness was attributed to cigarette smoking. Another scholar, age 13, was under medical treatment, and he had the character of being an inveterate smoker. The Rev. Holmes said that in his delirium in his last hours, the only thing which seemed to occupy the thoughts of the boy Wood was smoking. He asked for cigarettes and matches and made the motions of striking matches and lighting cigarettes."

Case 22.—Death of a country gentleman, age 56, reported in *The Lancet*, March, 1857, by Thomas Hawksley, M.D.

This case is too long to report in full. The deceased had taken a journey the day he died, and called to see a friend; he was shown into the drawing room. When his friend entered the room, the deceased was lying dead. Death was attributed to tobacco poisoning and heart failure by the doctors who made the post-mortem examination.

Case 23.—A sad fate recently overtook a gentleman, a smoker, who lived in Torquay. He was middle aged. One day he went out shooting rabbits. While walking up a hill, he suddenly fell on his face, and expired in a few minutes. He had not walked half a mile when his death occurred.

I will now report a case which happened recently in London :—

Case 24.—Mr. Schroeder, Coroner, held an inquest at St. Pancras on Mr. B. Castellotte, aged 66, a well-known dental surgeon, of Wimpole Street, Cavendish Square, W., who died at Euston Station on Tuesday. A daughter stated that her father had spent three weeks at Ryde, and she noticed that he avoided hills, and that his breathing was affected. He was a very great smoker of cigars and tobacco, but she did not know that he had suffered from nicotine poisoning. A porter at Euston said he found the deceased on the platform with a cigar near him. He died a few seconds later. Dr. Lewis Evans stated that Mr. Castellotte was an excessive smoker, and smoked strong Indian cigars. The witness warned him about the evil consequences, and knew that he was practically killing himself by it. He was strongly of opinion that the case was one of nicotine poisoning.

At the adjourned inquest, a son of Mr. Castellotte stated that his father had been an excessive smoker from boyhood. He could live on smoke, and did not take very much food. Dr. Edwin Hollings, who was called to see Mr. Castellotte at Euston Station, said he found nothing to suggest nicotine poisoning. A non-smoker might have exactly the same symptoms as the deceased. Dr. J. Thompson, who made the post-mortem, said that he had never come across a case of nicotine poisoning, and he believed it was mythical. A smoker who smoked excessively got nicotine poisoning, in the sense that it interfered with his digestion, upset his liver, and made him ill. He believed in the present case there was not the slightest doubt that excessive smoking produced depression of the heart, which acted fatally on a heart already diseased. The jury returned a verdict of "death from natural causes."

This is certainly a very sad ending to the life of an educated man, brought up and living in a Christian land.

What a strange taste to prefer tobacco to food. When he was a boy, did he prefer tobacco to food? I doubt it.

The habit was first acquired by the natural tendency of a boy to imitate men: perhaps he imitated his father, his school master, his clergyman, or his doctor. When the habit had become strong and the ill effects were visible, he was warned by a medical man that he was killing himself. The warning came too late. The habit was too strong. The habit, which was at first a silken thread, had become a chain of iron, too strong to be thrown off. The man's will was overpowered by the fatal narcotic. He lived with a mill-stone round his neck. Day by day the fatal poison was indulged in—the poisoned heart at length gave way while he was travelling. Had he died in bed, there would probably have been no inquest. May this case be a warning to men, and teach them that Nature must suffer when man presumes to introduce a narcotic poison into his system. Who will venture to say how many lives are being spoiled in Christian England in our own day?

Everyone who reads the newspaper must notice that a larger proportion of men than women die of sudden heart failure. If the majority of women lived easy and comfortable lives compared with the men, we should explain their comparative freedom from sudden heart failure to that fact, viz., less liability to exertion and over-work. But the fact is that women in these days are not only called upon to endure the risks of motherhood, but are often required to be "bread winners." Their lives are arduous beyond those of men, but they are less liable to sudden death from heart failure. There can be no doubt that disorders of the heart, often ending in sudden failure and death, are more common among men who smoke than among those who do not. Therefore, sudden deaths from heart failure are more common among men than women.

CHAPTER X.

A Series of Thirty-eight Genealogical Histories of Families of Non-smokers, with the number of Male and Female Births in each family; full particulars of the Miscarriages, Premature Births, Still-born Infants; Illnesses or Accidents in Pregnancy, Parturition, Lactation, and the ultimate Fate and State of each Child; with Tabular Abstract.

It is obvious that our habits should be regulated by the light of our medical knowledge. We should not "follow a multitude to do evil." When we see our fellow creatures being led astray into evil habits we should point out their errors and urge them to follow the better way. Are not these words addressed to all Christians, high and low, learned and unlearned?

"Ye are the light of the world."
"A city that is set on a hill cannot be hid."

I ask if it is honourable for the members of the British Medical Association to be silent on the dangers of the tobacco habit? If all the diseases which result from tobacco were clearly recognized and diagnosed as dependent on tobacco there would be a mass of evidence that would stagger humanity. I am writing from the experience I have gained as a general practitioner. We have drifted into a terrible abyss of mental and bodily diseases; health and peace of mind are being lost to an ever increasing number of people, while the returns of the Registrar-General bear witness to an ever increasing

number of deaths among men in the prime of life, and also to a steady decline in the birth rate.

I have set myself a gigantic task, to enquire into the effects of tobacco smoking, and I will prove that the wives of heavy smokers do not produce as many healthy children as the wives of non-smokers ; and also that male children are becoming actually fewer than female children among the wives of smokers. It is common both in hospital and in private practice to meet with patients suffering from a complication of diseases, and it is of no use trying to ascertain whether such illness is due chiefly to alcohol or tobacco.

In order to study the pathology of the tobacco habit in relation to the functions of generation, it is necessary to take notes of the conditions of smokers, and their wives and children at every age, regarding their moral, mental, and physical states. The information thus obtained would be of no value, except it could be compared with a healthy standard. Such a standard can be secured by taking notes concerning the moral, mental, and physical states of married men at all ages, who are healthy in all respects, and live under similar sanitary conditions, and are of the same social state as the others, but differ from them in being non-smokers. We shall never be able to recognize the causes of disease until we take a census on a scientific plan. My method of taking a complete history of a married couple will be explained in chapters 10 and 11. I separated the histories of smokers from those of non-smokers, and I was then able to prove that the wives of smokers suffered from a high degree of sterility, and from a larger number of abortions and other defects than the wives of non-smokers. Who can trace the remote effects of the tobacco habit on the system of a man who commences smoking at the period of puberty or soon after, and continues it through the whole of his married life to his death? Such knowledge can only be gained by the family doctor who attends the wife in all her confinements, and watches the growth of all the children to maturity.

Every branch of medical science must be founded on carefully recorded observations, conducted by competent observers for a long period, and must include sufficient cases illustrating similar facts, in order to draw safe conclusions. It is necessary that the social state and

environment of all the cases selected for comparison should be similar, and that cases of an exceptional nature, such as syphilis, alcoholism, phthisis, accident or domestic misfortune should be excluded. I consider that I have been placed in a favourable position for such an inquiry. I have taken the most complete and accurate histories, concerning the state and number of children born to each married couple, with details of the periods of gestation, parturition and lactation, including mention of every miscarriage, abscess of breast, still-birth, premature birth, twin-birth or other abnormality: also the history of the child in its struggle for existence from birth to the age of five, and the infectious diseases which are often fatal at that tender period.

I have collected the following histories in the course of my visits to my patients. They are all taken concerning mothers past the age of child-bearing, with two exceptions. In such an enquiry it is desirable, when possible, to ascertain the average quantity of tobacco used by each man. There are a few men who smoke a pipe only when opening a foul drain, who do not use more than one or two ounces a year, and there are others who only smoke on rare occasions to appear sociable. Such moderate use of tobacco cannot injure the blood permanently, and therefore I class them with the non-smokers.

I have classified my cases under the following heads:—

Class 1. Non-smokers.

Class 2. Smokers.

All the cases in Classes 1 and 2 are among my patients. They are masons, painters, carpenters, plumbers, gardeners, ex-soldiers and sailors, cab drivers, agents, small shopkeepers, builders, labourers, etc. I have not selected my cases, or tried to prove that non-smokers never meet with sickness, and are always fertile, and that all the diseases in the world are the result of tobacco smoking. My sole aim is to find the truth, and to dispel the illusion that smoking is a harmless pastime and a gentlemanly accomplishment.

I have since learnt that one man, Case 13 in Class 1, was at one time of his life an habitual smoker, and some of Class 1 were probably the sons of smokers, while some of the wives of the same class were the daughters of

drinkers and smokers, and consequently inherited a neurosis.

Therefore I regard my thirty-eight cases of non-smokers as below a standard of perfection, but still the best that can be obtained in an age when the smoking habit is nearly universal. It is, however, many degrees better than Class 2. I wish the reader to observe that the environment and occupations of my people are good and healthy, most of them are in the open air all day.

"When a man knows not, and knows not that he knows not, he is a fool—avoid him.

"When a man knows not, and knows that he knows not, he is simple—teach him.

"When a man knows, and knows not that he knows, he is asleep—wake him.

"When a man knows, and knows that he knows, he is wise—follow him."

I will now invite the reader to study the thirty-eight histories of non-smokers' families:—

Non-Smokers.

Case 1.—A. C. is a man who may be classed as a non-smoker; he rarely touches alcohol; is now 59, and looks healthy and robust; has often been employed opening defective drains, and has never suffered illness therefrom; nor has he been laid up with sickness for a single day since his marriage; his father was a sailor and a non-smoker. A. C. married at 22 a healthy woman, aged 21, who was a native of Dartmoor; her mother died of asthma at 85. When the wife was pregnant with her fifth child, she was obliged to go out as a charwoman, as her husband was out of work; she continued to work up to within three days of her confinement. She bore the following children:

1. Girl, living and married, aged 35.
2. Girl, ,, ,,
3. Boy, in the Navy.
4. Boy, now living.
5. Girl, now married, and has one son.
6. Girl, living and healthy.
7. Girl, ,, ,,
8. Girl, ,, ,, aged 18.

These eight children were born within seventeen years, they were all fed at the breast, and they are all living and healthy. The mother had no miscarriages, no abscesses, and no illnesses connected with her confinements; no twins. The children were all devoted to their home. Mrs. C. died at 56 from asthma and bronchitis, brought on by hard work, and by nursing a sick daughter day and night. She was a good woman, and was my patient in her last illness. This may be reckoned as a first-class family history, as each confinement ran a normal course from beginning to end, and all the children grew up healthy in all respects, morally and physically.

Case 2.—This is a remarkable history for the regular alternate births of boys and girls, all of whom are now living and healthy but one, who died. N. is a cab-driver; his father and mother are living and healthy; he has had no illness; he is a good husband and father; an abstainer from alcohol and tobacco, and is 52 years of age; his wife is a fine healthy woman, and is 47, but her family history is not good; her father was a heavy drinker and smoker, and was removed to an asylum, where he died; her mother died at 61, of cancer of the œsophagus, or stomach. Mrs. N. learnt dress-making in London, at the age of 13. At the age of 17 she was admitted to St. George's Hospital for gastric ulcer; she was married in Torquay, in December, 1883, at the age of 21; her husband was 25; she has had a happy married life, and enjoyed good health; Her husband had small wages, but he managed to provide a doctor for his wife in most of her confinements. Their family is as follows:

1. Girl, born 3rd October, 1885.
2. Boy, born 3rd November, 1887.
3. Girl, born 16th November, 1889.
4. Boy, born 26th October, 1891. Died at 13 months.
5. Girl, born 22nd December, 1893.
6. Boy, born 28th May, 1896.
7. Girl, born 10th May, 1898.
8. Boy, born 29th October, 1900.
9. Girl, born 8th September, 1903.
10. Boy, born 7th January, 1906.

She was attended by a midwife in her third confinement,

who delayed sending for a doctor till the patient was nearly dead from exhaustion. She had a long illness connected with her sixth confinement. In her seventh pregnancy, from the third to the seventh month, she lost blood per vaginam continually; in the fifth and tenth confinements, instruments were used; all children were breast fed but the two last; she had no miscarriage, no trouble with breasts; she never went out to work; the only defect in the mother and children is bad teeth. The children are bright, intelligent, and healthy, and are all doing well. The parents act as Christians and set a good example in all ways. Their chief wealth is their happiness in doing right, and in their industry.

Case 3.—J. M., age 65, a native of Brixham, he settled in Torquay in early life; he has been often occupied in repairing drains and sewers. The smells never upset him or caused illness; he always commenced work on a full stomach; his father was a non-smoker; he has never smoked but once, and never taken alcohol; he is healthy and well-nourished, eyes are clear and bright, his teeth are fairly good; he is intelligent and happy in his home; his wife is 57; she is healthy and well-nourished, and is also an abstainer from alcohol; she has borne six sons and four girls, all were healthy infants; all were fed on the breast for twelve months; when her last babe was weaned she went out to work; she became pregnant again, and through over-exertion she brought on a miscarriage.* All her confinements were normal, she never suffered from mammary abscess or other complication. The parents have good eye-sight. One son is in the Navy, and one in the Army.

Case 4.—L. is a labourer who has driven a coal cart for forty years or more; he has abstained from alcohol and tobacco over thirty-five years; his first wife died young, leaving him with three children; he married a second wife who was 21 when he was 27. The second wife came of healthy parents; her father was a non-smoker and lived to

*I use the terms abortion and miscarriage as synonymous. It applies to a pregnancy which terminates before the fœtus has arrived at a viable age. There is little or no hope of a fœtus living before the twenty-eighth week or seventh lunar month, and this period is generally fixed on as the limit between premature birth and abortion.

74 ; her mother lived to 73 ; she has borne the following children :

1. Girl, now healthy.
2. Boy ,,
3. Girl ,,
4. Boy ,,
5. Boy ,,
6. Girl ,,
7. Girl ,,
8. Girl ,,
9. Girl, died of bronchitis at two years.
10. Boy, died in convulsions at nine months.

All her confinements were natural ; she was never attended by a medical man ; all her children were breast-fed. They seem to have escaped illness in their early days, except one, who had double pneumonia. In those days she had to pay sixpence a week for schooling. The children were well fed ; the mother used to go out washing when she had weaned her children, and led an active laborious life ; she brought on two miscarriages through overwork, and once had an abscess of the breast from a chill ; she had no illness during the child-bearing period ; the only illness since the change was inflammation of the veins of the leg induced by a blow ; she is now 59, and still strong and active. She and her husband are true Christians and are happy in their faith. The husband had regular work, and required all he earned to feed and clothe the family and pay the rent.

Case 5.—A carpenter, a life-long abstainer from alcohol and tobacco ; he can do his work, though he is 75 ; his father and mother lived to 75 ; his father's mother lived to 97 ; he married at 26 ; his wife was 23, she bore :

1. Girl, she grew up to be a woman possessed of great self-control, and a love of duty and work ; honest and sober.
2. Girl, she married ; her husband was killed by accident ; she was left with two children ; she had a character like her sister's.
3. Girl, married ; she has suffered from puerperal insanity ; she is honest and sober.
4. Boy, died of scarlet fever at 3½ years.
5. Boy, grew up a sober and honest man.

6. Girl, born with a double hare-lip, only lived six weeks.

Wife had one miscarriage, no abscess of breast; she died, age 37; she was delicate.

Case 6.—F. L. was a native of Prussia who was born in the year 1835. At the age of 7 he worked in the fields; at the age of 14 he ran away from home to escape the tyranny of his step-mother; he went to sea; on one of his voyages his ship was unloading at Axmouth, in South Devon, when he fell in love with an English girl; he determined to desert his ship and to keep in concealment until after the ship had sailed. The captain of the ship made a diligent search daily for several weeks, but failed to capture the runaway. This sailor then got married to his sweetheart, and continued to earn his living on coasting vessels; he and his wife came to live in Torquay, where most of his children have been born; he had a bad fall thirty years ago, when he injured his back; he had a large rupture caused by a strain; he gave up work several years ago; his heart is hypertrophied; his arteries are thick, but straight, pulse regular; he is a man of strong will, but has no strength of body. His wife is a healthy contented woman and devoted to her husband.

"They live alone like Darby and Joan."

One son and several grandchildren live near. His wife gave me the following history:

When she had reached the seventh month in her first pregnancy, she lost her balance and fell down stairs and injured herself; she took to bed, and after seven days she was delivered of a still-born male child.

Her second child was a girl, who grew up a fine woman; she went to Australia and married.

Her third was a boy, who began climbing at the age of 18 months; he fell from a bedroom window and was killed.

Her fourth was a boy, who joined the Army; he died of enteric fever in the South African war.

Her fifth was a girl, who grew up a fine woman; she also went to Australia.

Her sixth was a boy, who remained in England.

Her seventh was a boy, who joined the Army; he is a

fine looking man 6ft. high; he is a total abstainer from alcohol and tobacco.

Her eighth was a boy, who was killed by a fall over a cliff at the age of 3, while chasing a butterfly.

The mother has enjoyed good health; had no miscarriage or abscess of breast. The father spent nothing in beer or tobacco; he insured in the Shipwrecked Mariners Society; he was shipwrecked three times; he brought up his children well and taught them to love hard work, to speak and act truthfully; all his children did well; he died at the age of 76 from acute pneumonia; he lived and died as a Christian hero; in his old age he suffered much from chronic rheumatism, caused by exposure to wet in his daily work.

Case 7.—C. is a widow, 75. Husband was a non-smoker, and rarely tasted alcohol; he had regular work as an hotel servant, and was a good husband and father; he died of acute pneumonia at the age of 50. The wife bore five boys and one girl; they were all fed on the breast, and grew up strong and healthy; none of them suffered from fits in dentition. The wife made good recoveries from her confinements.

Total children born: five sons, one daughter. All living.

The widow is respected and loved by her children and grandchildren. Her father died of phthisis when she was a girl.

Case 8.—A poor tradesman, 69; non-smoker; active and healthy; abstainer from alcohol. His first wife died very young and left him with two children; his second wife is a life-long abstainer from alcohol; she is thin, and active in mind and body; age 53. She has borne the following children:

1. Boy, born prematurely at eighth month because the mother kept at her usual work; he died after a few days. She then had a miscarriage at third month.
2. Boy, born two years after the last.
3. Girl „ „ „
4. Boy, born two and a half years after the last; he suffered from frequent colds while attending school; he died of phthisis at 17.
5. Boy, born two and a half years after the last.

6. Boy, born two years after the last; he died of meningitis at 6 years.
7. Boy, born two and a half years after the last.
8. Boy, born two years and nine months after the last.
9. Boy, born three years after the last.

The mother was 42 when the last child was born; all the children were breast fed. Total: eight boys (one died forty-eight hours from birth), one girl living.

One miscarriage; no abscess of breast. She was careful not to strain herself in her third and following conceptions, and she went to the full time. All the children had measles and whooping cough, and made good recoveries. The mother is now 53, and has recently recovered from acute tuberculosis of the lungs, leaving a vomica. She is now able to walk a mile, and is almost free from cough. This proves she has a great amount of vitality; her father is a non-smoker, and is now 80; her mother died at 77. It is certain she inherited a strong nature, and has treated herself wisely; she has worked hard to earn money by dressmaking; she is very thin. This family is a credit to the parents, who are intelligent and thrifty.

Case 9.—F. is a non-smoker, age 70, never used tobacco, and has not tasted alcohol for 28 years; he served 15 years in the Navy; his father was a very active man, and worked hard up to a few weeks before his death at the age of 77. By his first wife he had ten children, five boys and five girls, no miscarriages. One girl died at 2 years. Seven children are married and doing well. One son is a Baptist minister, and one is an officer in the Salvation Army; his wife died of internal inflammation at 42. By his second wife he had two children, both boys.

Case 10.—I obtained the following history from the widow, who is between 50 and 60; her father died suddenly at the age of 60; his wife bore five sons and five daughters. Mrs. Q. was married at the age of 23; her husband was 25; he was a ganger on the railway. At the age of 45 he suffered from giddiness; he consulted his doctor, who advised him to smoke. He had never smoked before, but he acted on the advice. Each pipe he smoked caused nausea and perspiration; he continued at his work. One day as he was returning home from work, he fell down

on the road and died; he died at the age of 47; his wife bore the following children:

1. Boy, was a strong babe.
2. Boy ,, ,,
3. Girl ,, ,,
4. Boy ,, ,,
5. Boy ,, ,,
6. Boy ,, ,,
7. Boy ,, ,,
8. Girl ,, ,,

They are all living. She had no miscarriages.

Case 11.—The husband is a good-tempered man, with a fresh colour and rather stout; his wife has borne the following children:

1. Boy.
2. Boy.
3. Girl.

She then ceased bearing for seven years.

4. Boy.
5. Boy.
6. Boy.

They all had measles and whooping-cough; they are above the average in weight and height; all were breast-fed. Between the third and fourth children she miscarried from the effects of a strain; all living and healthy.

Case 12.—Mrs. C. has brought up eleven children; one died at 18 of acute tuberculosis; the others are healthy; five sons and six daughters. The husband gave up smoking just before the birth of the first child; in order that he might be a good example to his family he has never smoked since, and has been a total abstainer from alcohol for twenty-eight years. I know one daughter and one son; they are tall, healthy, and above the average in intellect and physique.

Case 13.—Part life non-smoker. The husband is a gardener, the son of a heavy smoker; his usual beverage is a glass of beer at dinner; his wife is fat and good-tempered. She has borne the following children:

1. Boy.
2. Boy, became a soldier.

3. Boy.
4. Girl.
5. Girl.
6. Boy.
7. Girl.
8. } Twin boys, born prematurely at eighth month;
9. } one lived a few hours, the other eleven days.
10. Girl.
11. Girl, born with hare-lip, died under five years.
12. Girl.
13. Boy, died of bronchitis at two years.
14. Girl.

Total, seven boys (three died under five years), and seven girls (one died under five years). All were breast-fed; wife had no miscarriage or abscess. None of the children had convulsions in dentition.

Case 14.—P. B. is a labourer; he has never smoked, and has abstained from alcohol for twenty years; his wife was 19 at her marriage: she is now 60 and enjoys good health; all her confinements were normal except the first two, which happened when her husband was not an abstainer from alcohol; she has borne the following children:

1. Girl, born prematurely from fright; still-born.
2. Boy ,, ,, ,,
3. Boy, now living.
4. Girl, died at 15 from consumption of the bowels.
5. Girl, now married.
6. Boy, entered the Navy; he died of phthisis at 34; he smoked tobacco.
7. Girl, living.
8. Boy ,,
9. Girl ,,
10. Boy ,,
11. Girl ,,
12. Girl ,,
13. Boy, suffers from chronic phthisis.

Case 15.—A. B. was a labourer. In this family the parents were healthy, and their habits were good; the father never smoked and rarely tasted alcohol; the mother never tasted alcohol; the father died at 74 from bronchitis; his widow is about 65, a healthy and intelligent woman;

her father was a non-smoker; her father and mother lived to a good age. Mrs. A. B. had four children; no miscarriage, no abscess.

1. Girl, living and healthy.
2. Girl, became anæmic at 18, and is now unfit for work; emotional and timid.
3. Girl, was healthy till after marriage, when she became insane from the cruel conduct of her husband.
4. Boy, who was backward in teething, and died in convulsions at 21 months.

The father and mother were healthy and all the confinements normal.

Case 16.—The father of this family enjoys good health, and is full of energy; he is a builder; he has been a life-long abstainer from alcohol and tobacco; his wife has borne four sons, and two daughters—the sons are all living. She caught cold before one of her confinements, and the babe was born with the complaint and died in the fourth month; no miscarriage.

Case 17.—Mrs. L. was married at 26; her father was an abstainer from alcohol and tobacco, and had nineteen children who sat at the table together. Mrs. L. has borne seven boys and seven girls; she tried to suckle the first, but the nipples were retracted and the attempt failed; all the children were bottle-fed; she had a child about every year; seven died in fits under one year; one was killed in the birth by an accident.

Total, seven boys, three died under one year; seven girls, four died under one year. Her husband has never used alcohol or tobacco; they suffered from extreme poverty, and the wife had too much work; no miscarriage; no abscess of breast; she is a woman of extraordinary endurance and pluck; she is now 65. Here are two generations displaying remarkable fecundity, it may be called natural, because it has not been checked by the abuse of tobacco and alcohol on the part of the husbands; thirty-three children to two women.

Case 18.—R. is a well nourished man, and has a happy, contented mind; he takes an active part in Christian work; he is 46; his wife is 48; he is a carman; he married at 25; he has never smoked, and has been a teetotaler all

his married life; he has had no illness; his wife bore the following:

1. Boy, living and healthy.
2. Boy ,,
3. Girl ,,
4. Girl ,,
5. Boy ,,

The mother ceased bearing at 37; she had easy confinements; no miscarriage; no abscess; she suckled all the children the usual time.

Case 19.—T. is a healthy working man, with a fresh colour and clear eyes; of a cheerful nature with a clear intellect; he is 59; he is a road-sweeper; he has never been a smoker and has but rarely tasted alcohol. He married at the age of 31; his wife was 24; they had been married fifteen years when their first and only child was born—a healthy boy. She had one miscarriage two years before that event, at the second month; she has enjoyed good health since, and continued to menstruate regularly every month, until two weeks ago; she is now 52, a thin active intelligent woman; her boy caught measles while cutting his teeth; this was followed by otitis, and he has never been free from throat and ear trouble. School attendance aggravated the disease, and then he became deaf and highly nervous.

Case 20.—X. is now 43; he served twelve years in the Navy; he is now a postman; he is an intelligent healthy man, and a good husband and father; he is an abstainer from alcohol and tobacco; he married at 29; his wife was 24; she is an intelligent, active woman, and manages her children well; she has borne the following:

1. Girl, born June, 1898; living and well.
2. Boy, born January, 1900; died of convulsions, age 2.
3. Boy, born March, 1905; living and well.
4. Boy, born October, 1906; excitable; had bad convulsions at the age of 4.
5. Girl, born March, 1908; living and well.
6. Boy, born March, 1909; living and well; born with a cleft palate, very slight.
7. Boy, born August 11, 1910.

The wife has never been out working since her marriage; had no miscarriage; once had an abscess of breast.

Case 21.—G. is a prudent, temperate, healthy man, age 38; an ex-soldier, pensioner; had enteric fever in Egypt; he married in 1894, he was 22, his wife was 23; she is an active, intelligent, healthy woman, and is most attentive to her duties as a wife and mother; she is the daughter of a non-smoker; her father's history is given in Case 31. She has borne the following;

1. Boy, born December, 1896.
2. Boy, who died of measles under two years.
3. Girl, born March, 1903.
4. Boy, born April, 1905.
5. Boy, who died of whooping cough.
6. Boy, born June 16, 1908.

Case 22.—G., aged 59, is a good type of "working man," morally, mentally, and physically; has abstained from alcohol for twenty-three years, and never been a smoker; he married at 26, his wife was 28; she has always suffered from weak digestion; she has borne the following:

1. Girl, now living.
2. Girl, died of bronchitis at five months.
3. Girl, died from injury or neglect at birth.

The mother had an abscess of breast with the first child; had no miscarriage. G.'s father lived to 72; he was a non-smoker; he had three boys and four girls, all healthy.

Case 23.—W., age 56, is a good type of "working man," honest, industrious, and intelligent; of a healthy appearance, with no congestion of the capillaries in the face; he is active in good works. He had three attacks of rheumatic fever before he was 24, at which age he married; his wife was the same age. He has never been a smoker, and has abstained from alcohol for thirty-three years; his wife is healthy; she has borne the following children:

1. Girl, who died in convulsions, age 15 months.
2. Boy, now living.
3. Girl ,,

Case 24.—U., age 59; a good type of a "working man"; morally, mentally, and physically; had no illness and no accidents; he uses rock powder every day in blasting rocks in quarries; he married at 22; wife was same age; she bore one girl, who only lived three months; the wife is healthy and had only this one conception; he has always been temperate.

Case 25.—Mrs. K. is the wife of an ex-sergeant of the Army; she was born in England and went to live in India at the age of seven; she was married at the age of 18; her husband was then 27; they returned to England. It was nearly three years after her marriage when she gave birth to her first child, a boy; the presentation was the breech; he died in the birth.

2. Boy, now married.
3. Girl ,,
4. Girl ,,
5. Girl ,,
6. A boy, now a soldier, age 22; at the time of his birth, the mother was under 30; that was her last conception.

All the confinements were easy but the first; all children were breast-fed but the last; she had no trouble at the menstrual periods; the menses ceased at 44; the father is a life-long abstainer from alcohol and tobacco; he is active and alert and in excellent health and does not require spectacles; he is 60; his wife is in good health and she is 51.

Case 26. Mrs. W. is a strong, active, sober woman about 52; her husband is not so strong, is not a smoker and rarely takes alcohol; he was 29 and she was 19 at the time of marriage; she has borne:

1. Girl, now married with seven children.
2. Girl, died of diphtheria at 3.
3. Girl, now living.
4. Girl ,,
5. Boy, now in the Navy, age 23.

The wife says she never had trouble at the menstrual periods; had no miscarriage; no abscess.

Case 27.—S. is a mason 58; wife is 60; both are happy

and healthy; they have rarely tasted alcohol; she has borne:

1. Girl, living and healthy.
2. Boy „ „
3. Girl „ „
4. Boy „ „
5. Boy „ „
6. Boy „ „
7. Girl „ „
8. } Twins; boy, died on 7th day.
9. } Girl, died of whooping cough at 2 years.

All were breast-fed and strong infants; the first seven confinements were normal.

Case 28.—Wife of a non-smoker. Her husband was a steady man, a painter, plumber, etc.; he worked hard all the year round to maintain his wife and family in health and comfort; he suffered from palpitation of the heart for a long time; he died suddenly from heart disease at the age of 45; he disliked tobacco and did not smoke. She bore the following children:

1. Boy, born June, 1860; living, not married.
2. Boy, born January, 1862; married, three children.
3. Boy, born December, 1864 „ seven „
4. Girl, born December, 1865 „ two „
5. Boy, born October 1867: died under 2 years.
6. Girl, born December, 1870; single.
7. Boy, born December, 1872; married; no children.
8. Girl, born January, 1876; married; one child.

She had three miscarriages, one at third and another at second month; she had "gastric fever" after all her children were born; no other illness; she is now 77.

Case 29.—An unduly prolific pair. The husband is a bootmaker, age 69; he enjoys good health and still works at his trade; he has never smoked and rarely touched alcohol. The wife is intelligent and healthy; also 69; her father was not a smoker; he died at 64, three months after his wife. Before marriage she had irregular menstruation (amenorrhœa); they were both 23 at the time of marriage: she never took alcohol; she bore eighteen children, eleven boys and seven girls; one boy and one girl were still-born at the sixth month; one of these

still-births happened during a severe illness, induced by inspiring poisonous gases. One boy died at third month and two girls died at the fifth month ; twelve children grew up; her doctor said she had a weak heart and should not try to suckle her children for long ; she was able to suckle one right through ; she had easy confinements and good attendance ; she bore these eighteen children in twenty-two years ; she ceased bearing at 45 ; there are only seven now living. The excessive mortality suggests some delicacy amongst the deceased ; the survivors seem robust and virile. I suspect that her excessive fecundity would have been avoided had she been able to suckle each child the full period. They have a large number of grandchildren ; two sons are in the Royal Navy.

Case 30.—T. is an ex-soldier who saw some service in India ; he has been working as a labourer since he left the service ; he is an active, thin, and energetic man ; he is cheerful and intellectual ; he has a good set of clean teeth ; he is a good husband ; he has never been a smoker ; he is now 62 ; he has always enjoyed good health ; he married at the age of 26 ; his wife was the same age ; she looks healthy, but is extremely corpulent. They have been married thirty-five years and they have proved absolutely sterile ; the wife has never conceived. The wife has four brothers living, one of whom is the father of over seven children. The husband's father was a non-smoker ; he left eight sons and two daughters and lived to 72. The obesity of the wife amounts to disease. They are both sober.

Case 31.—R. was the son of an abstainer from alcohol and tobacco ; he was one of a large family of healthy children ; his father died at 78 ; his mother lived to 91.

I have known R. for several years as a steady workman and a total abstainer from alcohol and tobacco ; he was 22 at the time of his marriage and his wife 23 (her father died of phthisis at 50) ; he is now 66 and has only had one serious illness, viz., influenza ; is now full of vigour ; has good eyesight ; his front teeth are sound ; he has a head of thick brown hair ; his wife bore the following :

1. Boy, died of bronchitis at 3.
2. Girl (the wife of case 21), strong.
3. Girl, now married ; not robust ; has two children.

4. Girl, now married ; has one boy.
5. Girl, aged 30 ; now married ; has one girl.
6. Girl, died at 6½ from inflammation of the bowels.

The mother had no miscarriage, no abscess of breast ; she appears to have inherited weakness and to have worked too hard ; she died of obstruction of the bowels. The fifth child developed phthisis at 28.

Case 32.—C. is a healthy labourer, age 65 ; the wife is 64 ; he was 28 when he married ; she was 27 ; he has never smoked ; has had no illness and is still active and healthy. The wife has borne the following children :

Five girls ; one died at 17 months.
One girl, still-born at the eighth month.
One boy now aged 25.

No miscarriage ; no abscess of breast. The wife's father lived to 84 ; her mother lived to 66 ; they had thirteen children.

Case 33.—The father of the following family is now 65, and his wife the same ; they have both enjoyed good health. The father is slim and active ; the wife conceived as follows :

The first conception ended in a miscarriage about the third month, then followed these births.

1. Girl, now married.
2. Boy, now living.
3. Boy ,,
4. Girl ,,
5. } Twin boys ; one was still-born, the other has grown
6. } the strongest and biggest of all the children.
7. Girl, now living.
8. Boy ,,
9. Girl ,,
10. Girl ,,

A second miscarriage occurred later on. All the children were breast-fed. This is an equally balanced family with only one death, which was probably the result of an accident at birth. The husband was not a smoker and not a beer-drinker ; his father was not a smoker.

Case 34.—C. is a builder, nearly 80 years of age ; he has been a total abstainer from alcohol and tobacco all his

life ; he is still active and full of energy ; his wife bore four sons and two daughters ; she died some years ago ; two sons died and one girl.

Case 35.—The history of a grand old man of North Devon, who has never smoked and been temperate in all things ; he is now 87 and still works as a thatcher of cottages, etc. ; his wife died at 69 ; she bore four sons and six daughters besides three miscarriages. One boy died of croup at 2 ; one daughter is married to a non-smoker, who is farming in America—they have four sons and one daughter ; another married daughter is well-known to me ; she is a tall good-looking woman ; she possesses great moral courage, sound judgment and determination, associated with great bodily strength and endurance ; her powers of endurance have been severely tested in her home. Three sons who are non-smokers have in the aggregate thirteen sons and six girls. Two daughters who married non-smokers have six boys and six girls, giving a total of nineteen sons and twelve daughters. I regard the high ratio of boys to girls as evidence of a high degree of health and virility among the three sons, and I attribute it to the fact that they were born free from the taint or blight of tobacco, and kept themselves free from it all their lives. The old man has ten great-grandchildren. The ratio of males to females in these five families is 1,583 to 1,000 F.

Case 36.—A member of the Brethren, had seven sons and one daughter ; one son died of phthisis at 15. I have met one of his sons who is a fine looking healthy man with a head showing good frontal development ; he has a fresh colour, clear eyes, and good teeth ; he is not a smoker.

Case 37.—The following history was given to me by one of the daughters, who is well-known to me. She is a bright, active intelligent woman, one of the best of wives and mothers ; her married history is recorded in Case 20 of this series ; her father was born in Torquay ; he was not a smoker ; he was tall and active ; he worked as a scavenger till the age of 60, when he was taken with apoplexy while stooping ; he died three weeks later ; his widow is now 75 ; she bore three sons and three daughters, all of them above the average, in intellect, moral and physical development.

Case 38.—In December, 1906, I attended a man, age 82. I was surprised at his healthy appearance and his happy, simple nature; his teeth were unusually well preserved, his gums healthy, and tongue clean; pulse was regular and soft, 92; he had a good crop of silvery hair, also good sight and hearing; he was suffering from incontinence of urine, due to enlargement of the prostate; he told me he had not smoked or tasted alcohol for forty years; his wife bore five sons and five daughters, who grew up and were dutiful children, with one exception; the wife died at the age of 60. In December, 1907, he suffered from acute cystitis and had to submit to constant catheterism; he bore his sufferings with great fortitude, and had a good digestion to within a few days before death; he died peacefully on January 3, 1908, surrounded by his affectionate sons and daughters and grandchildren.

ABSTRACT I.

Abstract of Cases among Non-Smokers. Class 1.

Case	Born living — M.	Born living — F.	Died under 5 years — M.	Died under 5 years — F.	Still born — M.	Still born — F.	Miscarriages	Abscess of Breast	Sets of Twins
1	2	6	—	—	—	—	—	—	—
2	5	5	1	—	—	—	—	—	—
3	6	4	—	—	—	—	1	—	—
4	4	6	1	1	—	—	2	1	—
5	2	4	1	1	—	—	1	—	—
6	5	2	—	—	1	—	—	—	—
7	5	1	—	—	—	—	—	—	—
8	8	1	1	—	—	—	1	—	—
9	5	5	—	1	—	—	—	—	—
10	6	2	—	—	—	—	—	—	—
11	5	1	—	—	—	—	1	—	—
12	5	6	—	—	—	—	—	—	—
13	7	7	3	1	—	—	—	—	1
14	5	6	1	1	1	1	—	—	—
15	1	3	1	—	—	—	—	—	—
16	4	2	—	1	—	—	—	—	—
17	7	7	3	4	—	—	—	—	—
18	3	2	—	—	—	—	—	—	—
19	1	—	—	—	—	—	1	—	—
20	5	2	1	—	—	—	—	1	—
21	5	1	2	—	—	—	—	—	—
22	—	3	—	2	—	—	—	1	—
23	1	2	—	1	—	—	—	—	—
24	—	1	—	1	—	—	—	—	—
25	2	3	1	—	1	—	—	—	—
26	1	4	—	1	—	—	—	—	—
27	5	4	1	1	—	—	—	—	1
28	5	3	1	—	—	—	3	—	—
29	10	6	1	2	1	1	—	—	—
30	—	—	—	—	—	—	—	—	—
31	1	5	1	—	—	—	—	—	—
32	1	5	—	1	—	1	—	—	—
33	4	5	—	—	1	—	2	—	—
34	4	2	2	1	—	—	—	—	—
35	4	6	1	—	—	—	3	—	—
36	7	1	—	—	—	—	—	—	—
37	3	3	—	—	—	—	—	—	—
38	5	5	—	—	—	—	—	—	—
Tot.	149	131	23	20	5	3	15	3	2
	280		43						

CHAPTER XI.

A series of Fifty-seven Histories of the Families of Smokers, with similar details; with Tabular Abstract.

Class 2. Smokers.

Case 1.—Mrs. P. is a thin, wiry widow about 60; her father died of phthisis six months after her birth; she married at the age of 19; her husband was a few years older; he was often out of work for long periods; she suffered many hardships and did rough work when able; her husband did not smoke till he was 25, and began the habit at a doctor's advice. She bore the following children:

1. Boy, born December, 1862, died of phthisis at 30.
2. Girl ,, ,, 1864, married a healthy man; she had two sons, one died of phthisis.
3. Boy, born July, 1866.
4. Girl ,, March 1869, married, has two tuberculous children.
5. Boy, born May, 1871.
6. Girl ,, ,, 1873.
7. Boy ,, ,, 1875.
8. Boy ,, July, 1877, became insane at 25.
9. Girl ,, May, 1879.
10. Girl ,, July, 1884.
11. Twins. Boy, born March, 1886, died at birth from injury.
12. Boy, became a cigarette smoker; now 21, suffering from incipient phthisis.

The daughters are anæmic; their father died of decline at 63; he was a sober, steady man. The wife suffered from an abscess of left breast when suckling her third child. When pregnant with her seventh child and near her term, an abscess formed in right breast. The paternal grandfather of these children was a heavy drinker and died of alcoholism. He probably transmitted a feeble constitution to his son, who begat twelve delicate children and died of decline at 63. One grandson died recently of phthisis, which he inherited from his mother; two other grandchildren by the fourth daughter also show tuberculous disease in the glands. The children in this list inherited an alcoholic taint from the grandfather, and a tobacco taint from the father; fortunately, they had good blood from the mother, who was in all respects a good mother; she had easy confinements.

Case 2.—Mrs. U. is a large woman of calm temper; she married at 22 and is now 50; her husband is 51; he smoked an ounce of tobacco daily for many years; was never "a drinker." She suffered much in her first pregnancy; her feet and legs were swollen; she bore the following children:

1. } Twin boys, still-born, one a foot presentation.
2. }
3. Boy, tedious confinement, instruments used.
4. Boy, died of fits at end of first year.
5. Girl, now living, placenta adherent; metritis followed.
6. Boy, now living.
7. Girl ,,
8. Girl, anæmic.
9. Boy, still-born.
10. Girl, now living.

All children were breast-fed the full time. The mother has been almost "teetotal" and enjoyed good health before marriage. The father has been steady and sober, though not teetotal. Many years ago he got an inflamed wound on his leg from the pressure of his boot, he neglected to secure medical aid and the wound became so deep that it was necessary to amputate the leg. At the age of 46 he became blind in both eyes from cataract; he underwent operation. The wife has been in a feeble state of body

for over two years; she has no organic disease. I think the cause of her weakness is nervous exhaustion, the result of bad confinements and so many domestic troubles in the way of illness among her children; two of the girls are delicate. I cannot find any adequate cause for all these bad confinements, except on supposition that the husband poisoned his blood and that of his wife and children by habitual smoking. It is remarkable that all the girls were born naturally and survived, while out of a total of six boys, three died in birth and one died in the twelfth month. I am inclined to think that the boys inherited more of the tobacco taint than the girls, and hence their greater fatality. Total, six boys born, only two grew up; four girls born, all living.

Case 3.—The father is sober and industrious; he looks haggard and care-worn; he is a heavy smoker; he works in a bakehouse; his wife is a good-tempered, active little woman, who does not take alcohol; she has borne the following:

1. Girl.
2. Boy, suffered from partial infantile paralysis in one leg.
3. Boy, died under 5 years of "consumptive bowels."
4. Girl.
5. Boy.
6. Girl, died of measles at 4.
7. Girl.
8. Boy.
9. Boy.
10. Girl, died of measles at 15th month.
11. Boy.
12. Girl, died of diphtheria.

The mother is healthy and strong; she never miscarried; no abscess of breast. The youngest boy has a weak heart and is anæmic. The high mortality of the children is evidence of feeble vitality.

Case 4.—The husband is about 54; an hotel bus conductor; he looks as if he indulged freely in beer; he smokes in his home every night in his wife's company; his wife is 48; they have been married 26 years. Her first conception ended in a miscarriage at the second month,

and was attended with much loss of blood. Her second conception ran a normal course to the full time; she bore a girl who is now married; she is pale and neurotic. Her third conception was normal; she bore a girl who resembles her mother and is rising 16. From that time, the mother says she has miscarried eight times in the third month, including two sets of twins. She is now in good health and is regular at the menstrual periods. There are no signs of syphilis in either of the parents or the two children. The husband and wife are now healthy; her father kept a village inn, and she had to serve in the bar-room, and was exposed to tobacco smoke for many years before marriage; her husband has been a sober man.

Case 5.—The father is a mason and temperate; he drinks beer; his wife takes beer once or twice a day and often has dyspepsia; she has borne the following:

1. Boy, was choked when eating an orange by the entrance of a seed into the larynx.
2. Boy, living.
3. Boy, died an hour after birth.
4. Boy, living.
5. Boy ,,
6. Boy ,,

The mother had two miscarriages, one was caused by a fall; her children were all delicate at birth, two cut their teeth with convulsions, one had bronchitis in dentition. The mother was laid up after one confinement with phlebitis of thigh and leg. All the children were breast-fed. The boys have suffered to an unusual extent from infectious diseases and from want of tone in the heart and feeble circulation, etc.

Case 6.—The father was a mason; he drank to excess to the age of 50, and smoked to excess to the age of 70, when he died suddenly from heart failure while sitting down. Age at marriage 21. The mother is now 75 (her mother lived to 90); she is a life-long abstainer and has great tenacity of life; she suffers from bronchitis. Age at marriage 19. She bore the following:

1. Boy, grew up obstinate and undutiful.
2. Boy, foot presentation, still-born.
3. Girl, now married.

4. Girl, now married.
5. Girl, died of rheumatic fever at 21.
6. Girl, died of meningitis, result of over-pressure at school at age of 10. She had one miscarriage at fourth month.

The mother bore all these children before she was 29, and had no child after that age; her husband was thriftless and often out of work; the mother was forced to leave home to earn money to keep the home together. I have attended this old lady for several years for severe attacks of bronchitis. I despaired of her life last winter, but her vigorous constitution helped her to withstand the severe strain on the heart. She inherited strength of heart from her mother, and she has transmitted the same quality to two of her daughters, who are patients of mine. It is remarkable that the fecundity of this married couple only lasted for ten years, and that they became barren when the wife was 29 and the husband only 31. She was barren during sixteen years when she might have been fertile, that is, from 29 to 45. The husband was persuaded to give up alcohol at the age of 50, but he was unable to give up tobacco; he continued to smoke when he was beyond work; he suffered from shortness of breath for several years before death. He did not die of alcohol poisoning; I suspect he died from the effects of tobacco on the blood and on the tissues of the heart. The history of his eldest daughter is given in Case 10 of this chapter.

I am now attending four generations of this family, ranging from 75 years of age to 2 weeks. The old lady suffers from cataract, but is otherwise in good health; her pulse is regular and never over 50.

It was a common custom among the old mid-wives in the west of England to stretch and pinch the nipples of all new-born female infants. It was termed "breaking the strings," and was done with the object of developing the nipples; sometimes the manipulation was followed by inflammation, causing retraction of the nipples, which became a permanent defect. I recently met with an instance of this treatment on an infant I attended; I did not see the operation done, but I saw the child a few days afterwards, when both breasts were acutely inflamed and discharging a milky fluid. I suspect that many of the

inverted and retracted nipples we meet with arise in this barbarous treatment.

Case 7.—The following history seems to indicate that the sons of a smoker inherit a feeble constitution, while the daughters may be strong and healthy.

The father is a labourer of 38; he married at 21; was always a sober man; his wife is 34, healthy and sober; he was in the Army, and used to smoke heavily; she has borne four boys and four girls. Two boys were born prematurely and only lived a few hours; another died of convulsions at three months, and another died of bronchitis at fourteen months; the four girls are healthy. The mother had one miscarriage at the fifth month. All the children were breast-fed.

Case 8.—The history of a British Tar, who smoked and chewed tobacco "ad libitum" and took his grog with moderation with exceptions; he married very young, and entered the Navy as a carpenter at the age of 22; he never had a day's sickness while in the Service; he left the Navy in good health with a pension at the age of 45; he was a man of unusual muscular development, but he has gradually dwindled to a bag of bones; his face is sallow, eyes dull, and he has suffered from asthma and bronchitis both summer and winter for many years; he is 76, and is very feeble compared to many non-smokers of the same age; he had five brothers and five sisters, all healthy; his wife was 19 at her marriage; her first child, a girl, was born eighteen months after, a fine babe; she was breast-fed; the father was then living at home and used to smoke before his wife and babe. The mother was well satisfied with the health of the babe when she reached her sixth month and intended to short frock her. She woke up one morning to find her babe lying by her left side in bed dead; her husband was sleeping by her right side. Three boys were born at long intervals, only one grew up.

Case 9.—The husband is now 70; has been an abstainer from alcohol for many years, but he has always smoked to excess; he is feeble in mind and body and often depressed; his tissues are atrophied; his cheeks are hollow, eyes are dull; his wife is healthy and active; her first child was a girl; her next conception ended in a miscarriage at

the third month; there was no accident or fright to account for it; her second was a boy; her third was a girl, who had convulsions in dentition; her fourth was a girl, who died of whooping-cough at the age of 2. There is no doubt that the father's senility is due to chronic tobacco poisoning, and I think it is probable that the miscarriage was the result of the action of nicotine on the ovum.

Case 10.—Mrs. K., the daughter of No. 6. She and her husband were under 19 at the time of marriage; she resembles her mother in appearance and in constitution and character; in early days she had painful menstruation; her husband is a steady man, he has smoked regularly; she has borne three boys and ten girls. One boy died of brain fever from overwork at school; two of the boys are now living; one girl was born with a hare-lip and cleft palate, and only lived seven months; four girls died of whooping-cough under 2 years. She had no miscarriage, no abscess; she is now 52; she was unable to suckle any of her children except the seventh. Strangely, she was ill in bed three months before she brought forth her seventh child, and was fed entirely on iced milk. Her seventh was a foot presentation; she was suckled for twelve months, and she is now married and the mother of a boy and a girl; she resembles her mother in her inability to suckle either of her children, the breasts never secreted milk. The fertile period in Mrs. K. lasted from 18 to 38; she had no conception after the age of 38; while she was pregnant she often went out to work, and, owing to her strong nerve and heart, she never aborted; she has had excessive loss at menstrual periods up to last June, when they ceased; she is now 52 and getting feeble.

Case 11.—Mr. E. was born and bred in a village; he worked as a quarryman; he has always enjoyed good health and is now a cheery old man of 77; he married in 1854 at the age of 21; he was a beer drinker to the age of 40; he smoked five or six ounces of shag tobacco a week to the age of 40, when he gave up both. His wife was country bred; she was 17 years and 11 months old at the time of her marriage; she is now a handsome woman, age 75; her only trouble is an ulcer of the leg and varicose veins; her husband has been blind many years, the result of an accident. When she reached the

seventh month in her first pregnancy, a hard painful swelling appeared in the left breast and developed an abscess which discharged through seventeen openings; when it healed the nipple was retracted. That breast was never any good for lactation during the rest of her life. All her confinements were normal; her children were born as follows:

1. Boy, fed on right breast only.
2. Girl ,, ,,
3. Boy ,, ,,
4. Girl ,, ,,
5. Boy ,, ,,
6. Girl ,, ,,
7. Girl ,, ,,
8. Girl ,, ,,
9. Girl ,, ,,
10. Girl. On the third day after the birth the milk was absent and "milk fever" set in; she had a long serious illness. A large abscess formed in the pelvis and burst in the right groin. The babe was bottle-fed. The menses were absent for nine months after the confinement.
11. Her last child was a girl who came one year and nine months after the last; the mother suckled her.

These eleven children were born within twenty-two years; she ceased bearing at 41. All her children are living but one, who died about 30 years of age. They have over fifty grandchildren living and about eight great-grandchildren. The cost of tobacco during his smoking days was probably £3 a year, which in twenty years amounts to £60. Total of children, three boys, eight girls.

Case 12.—A family of twelve children, including a boy and girl born "imbeciles." The father was a sailor; he married at 22; his wife was 20; he is now 77. He often suffers from palpitation, the pulse is irregular; his face is fat and of a deep red colour with injected capillaries; he is corpulent and has the look of a beer drinker; he has used tobacco for smoking and chewing all his life. His wife is healthy and well nourished; her children came as follows:

1. Girl, living and healthy.

2. Boy, died from croup, age 19 months.
3. Boy, he became a smoker; at the age of 23 he fell over the cliff and was killed.
4. Boy, living and healthy.
5. Girl ,, ,,
6. Girl ,, ,,
7. Girl, born an imbecile, with congenital nervous disease, died at 23.
8. Girl, living and healthy.
9. Boy ,, ,,
10. Boy, born an imbecile, with congenital nervous disease.
11. Boy, born healthy, "he pined away after vaccination" (the mother's words).
12. Boy, living and healthy.

She states she had one miscarriage caused by fright. The mother is now living; she is 76, is well-nourished, strong and active. The imbecile boy did not learn to walk till about the third year; he went to school, but could not learn lessons; he is now 27 years old and is quite childish. The mother thinks she suffered from a fright when she was pregnant with the imbecile boy and girl, but the story is the usual one of seeing a strange cat in the house.

The father died in February, 1911, from an attack of apoplexy, which was attended with pneumonia, retention of urine from an old stricture and left hemiplegia. I am puzzled how to account for the mother bearing one boy and one girl imbecile in mind and body. It is important to observe she had borne six healthy children before the imbecile girl was born. This is proof that the mother was properly formed and had been prudent during six pregnancies, and had been able to bear six healthy children. Her tenth child was born in a similar state of disease. The last two were healthy. The mother is well known to me, I have attended her since her husband's death; she is of large frame, is well nourished, of a calm, peaceful temper, and in all respects a superior woman; the last woman I should expect to be frightened by such a common spectacle as a strange cat in the house. I don't believe in the "strange cat" theory, but I am convinced there was one if not two poisons present in the blood of the husband during all the years of his married life; I don't think he indulged to excess in alcohol, for his wages

were not equal to provide much in that way, but he was an excessive smoker, and, in consequence, his whole vascular system became disordered, and his face and head extremely congested; the result of this condition was hæmorrhage in the brain which caused his death; he died at the age of 77. I attribute the congenital diseases in the two imbeciles to paternal poison, viz., tobacco. Men who smoke do not always limit themselves to a fixed amount of tobacco; for instance, during holidays and Sundays they often smoke all day long, so that the state of the blood varies considerably according to the quantity they smoke. I must not attempt to explain why two children suffered in this way and ten escaped and were born healthy. It is a cause of thankfulness and surprise that any of them were preserved from the toxic influences which poisoned the source of life in the father, and possibly also the maternal blood which nourished the embryo.

Case 13.—H. is an old sailor. At the time of his marriage he was 31; his wife was 24; his father and her father were non-smokers. H. has been a smoker from early manhood and has not tasted alcohol for 30 years. A few years ago he became suddenly paralyzed on the left side; he can now walk a little, but cannot speak clearly. His wife has borne:

1. Girl.
2. Girl.
3. Girl.
4. Girl.
5. Girl.
6. Girl.
7. Girl.
8. Boy, died of croup at 2½ years.
9. } Boy twins, lived 10 and 12 weeks.
10. }

Two of the daughters died under 5 years; the mother had six miscarriages; the mother is still active. She had an abscess of breast with her first and third child.

Case 14.—Mrs. I. is a bright, active little widow, age 77; by her first husband she had one boy, now living; for her second husband, she married a soldier, a man of first class physique, who had lost a leg in the Crimean war;

he was a tailor by trade, sometimes he indulged to excess in alcohol, while his indulgence in tobacco was excessive day by day. Sometimes he smoked a quarter of a pound a week; he died of general paralysis at the age of 80; he was bed-ridden for three years; he lost the power of speech and was almost blind for a year before his death. In my opinion, the disease was the result of chronic nicotine poisoning. The wife is a very sober and healthy woman; she bore the following children by her second husband:

1. Girl, died at 41.
2. Girl, healthy at birth. She suffered from eczema after vaccination, and died of convulsions at 16 months.
3. Girl, had convulsions badly in dentition, is now living and healthy.
4. Boy, feeble at birth, lived 3 weeks (miscarriage at second month).
5. Girl, born very small at seventh month, lived twenty-four hours. The mother "lost pints of water from the womb at the birth."
6. Girl, still-born.
7. } Twins. Girl, died, age 7 months.
8. } Girl ,, 18 ,,
9. Boy, who was always crying, died under one year.
10. Boy, still-born, premature; placenta was adherent.

Case 15.—M. is a man who enjoys his beer and tobacco. He married at 23, his wife was 19; she gave me the following history: she bore the following children:

1. Girl, at full time, a fine child; the mother had retracted nipples, had an abscess in each breast, and was unable to suckle. After vaccination the infant's arm was much inflamed, and it died of convulsions at three months.
2. Boy, born at the seventh month. At the third week a double rupture appeared; he died, age 5 months; the mother had abscesses in both breasts.
3. Girl, fed on the bottle, died in fits in 3rd week.
4. Boy, the mother was afraid to attempt to suckle him; he was fed on the bottle and is now a strong boy.

5. Girl, had a bad arm after vaccination and nearly died.
6. Girl, at full time, died of measles at 12 months.

The mother is now about 35 and comes of a healthy family; she is strictly sober; she is nearly worn out with the illnesses she has endured, the nursing of sick children, and her domestic duties.

Case 16.—The husband earns his living as a shopman; he has been married ten years. I have known his wife for several years and have attended the children, but have not attended the wife in her confinements. In the first she had twins, girls, which were still-born; chloroform was given; puerperal fever followed. The second confinement was normal; she bore a girl Her third was normal, also a girl; she suckled her for some time and then an abscess of the breast formed, and then she weaned her child. Her fourth followed the previous in twelve months; she was delivered at the eighth month of a female child, which lived twenty-four hours. Her fifth was a large child, a girl; the confinement was a bad one; her babe was bottle-fed, she died of whooping-cough. Her last were twins, two boys, both living, born in October 1910. The wife is about 30 years old and fairly healthy, takes little if any alcohol. There is no trace of syphilis in her or any of the children.

This case may be called one of abnormal fecundity, consisting of two sets of twins and four single births in less than ten years. The wife did not inherit a tendency toward twin births. Her father was a non-smoker, and his wife bore five sons, one died of injury at birth, and five girls, one died of convulsions; nor had her husband any relation who bore twins.

Case 17.—S. is a market-gardener, age 45; he is a thrifty and sober man, but admits to having smoked half an ounce of tobacco a day for many years; his face is pale and wrinkled and he is rather lethargic; at the age of 33 he married a widow age 25, the mother of a boy and a girl. After her second marriage the wife remained barren for twelve years and then brought forth a boy; he is being fed on the breast and is doing well. The wife had no conception the first eleven years of her present married

life. The birth of one child in twelve years, in a woman who has reached the age of 37, may be called "comparative sterility." The father looks unhealthy; he knows he has injured his health with tobacco, and is now beginning to abandon the habit at my suggestion.

Case 18.—The husband is a heavy smoker, and a beer drinker, is 46, and enjoys good health. He married at the age of 23, his wife was 24; they have now been married 23 years. Her frame is large, she is tall and well-built. All her confinements have been tedious; all the children have been born with instruments but two, they came as follow:

1. Boy, living.
2. Girl, ,,
3. } Twin boys, one died within 2 hours; the other
4. } lived 7 months.
5. Girl, living.
6. Boy, ,,
7. A still-born boy.

She was 42 at the time of his birth; she had six confinements in eighteen years; no miscarriage, no abscess. She suckled all her children for twelve months; her health has been bad since her last confinement; her heart is sluggish and she suffers from varicose ulcers and low spirits; she is only 47 years of age.

Case 19.—Mrs. Y.'s grandfather died insane; her father was a coachman, and afterwards worked in a brewery; he used to smoke half-an-ounce of tobacco a day; he drank more alcohol than was good for him; he died of "gout in the kidneys and syncope" after twenty-four hours' illness, aged 53. Mrs. Y. is now 38; she married at 25 in the year 1897; her husband is a sober, healthy man, who smokes more or less.

1. Boy, born in 1898; he lived thirty-two hours; the mother became insane during the pregnancy, and was placed in an asylum; she recovered and returned home two weeks after her confinement.
2. Girl, born in 1899, she is neurotic.
3. Boy, born in 1900.

4. Girl, who was born in 1904.
5. Boy, born in 1909.

Mrs. Y. inherits a neurotic taint from her grandfather and from her father, who was a heavy smoker and also an abuser of alcohol; she is strictly temperate.

Case 20.—The father is 40; has been leading a healthy open-air life for many years; he is pale and rather fat; he often suffers from pharyngitis, the result of tobacco smoke; he is a life-long abstainer from alcohol. He began to smoke tobacco at the age of 30 at the advice of his doctor; in the course of time he consumed as much as an ounce a day. At the time of his marriage he was 21 and his wife 22. They had five children within twelve years:

1. Girl, born eighteen months after marriage, she died of phthisis at 16.
2. Girl, born two years and three months after the last.
3. Girl, born two years and one month after the last.
4. Boy, born two years and two months after the last, he died of measles in the 15th month.
5. Girl, born four years after the last.

Three now living.

Case 21.—B. was a labourer who married a healthy woman, age 19; he smoked heavily. His wife bore the following children:

1. Boy, suffered from fits in infancy, and occasionally in manhood. Now married, with two children; his first child a girl, died in convulsions at 12th month; the second child had fits.
2. Boy, now serving in the Navy.
3. Boy, who smoked himself to death at 25 with "Woodbine" cigarettes.
4. Boy, living and healthy.
5. Boy, died of phthisis at 23; he smoked cigarettes.
6. Girl, living.
7. Girl, died of phthisis at 17.
8. Boy, died of fits at 18 months.
9. Boy, who lived 7 days.
10. Boy, born four months before his father's death. "He wasted away," only lived 9 months.

She had easy confinements, and no miscarriage; she

enjoys good health now. The father died of phthisis at 39. All the children were breast-fed.

I have attended three members of this family for fatal illnesses, and know the constitutions of the children, and that of their mother; she is still a healthy woman, well nourished, and good tempered. It appears to me that the three children last born had less vigour than the first seven, as the father's health at the time of impregnation was in a feeble state, the result of many years' indulgence in tobacco. The first seven children were strong, and survived the period of puberty.

This case is an instructive one, because it shows that the sons inherited a craving for tobacco; they all took to smoking early; one died of phthisis at 23, and another died of atrophy and anæmia at 25 (*vide* Case 8, chapter 9, page 73).

Case 22.—Mrs. S., a good-tempered, broad-chested fat woman, over 50; was born on Dartmoor and brought up to country life; her father was a non-smoker, lived to 70; her mother lived to 90. Mrs. S. married at 26 to a plasterer, age 31; he smoked a lot, two ounces or more a week; he was not a strong man; he had a weak heart and died at 50. She bore the following children;

1. Boy, now living and healthy.
2. Boy, killed by an accident at 6 years while at play.
3. Boy, got cold and died of consumptive bowels at 6.
4. Boy, now living, but not robust.
5. Girl, now healthy.
6. Girl ,,
7. Girl ,,

} All were breast-fed.

She had two miscarriages; she thinks these were caused by lifting heavy weights; she had to go out to work when her husband was ill.

Case 23.—Mrs. F. is an active, healthy widow, about 60; she was married at 21; her husband was a coachman; he used to smoke a pipe regularly; he died of cancer of the mouth at 52; she bore the following children:

1. Boy, became a coachman.
2. Girl, living and healthy (married).
3. Girl, died of scarlet fever over 5 years.
4. Boy, died of scarlet fever under 5 years.

5. Boy, enlisted in the Army and was invalided home from India.
6. Boy, died at 3 months.
7. Girl, living now.

The mother had an abscess of right breast with the third child ; she had one miscarriage at third month.

Case 24.—The husband, L., is a steady, intelligent man ; he married at 26 ; his wife was 21 ; she suffered from cough in early life, and was under treatment at the Brompton Hospital ; her father used to drink and smoke to excess ; he died of phthisis at 31, a few months before her birth.

Her first child, a girl, was born twelve months after marriage ; she suckled her for three months ; that girl is now married, with three children.

Her second child, a boy, was born two years later ; he was breast-fed for twelve months. About this time her husband began to smoke, and soon used half-an-ounce a day. Twelve months after her confinement she had a miscarriage, and a second one two months later.

From that time to the age of 47 she suffered from menorrhagia, when the change of life occurred. She is now 60, anæmic and neurotic ; her boy is living ; her mother lived to 72. Mrs. L. was an only child and inherited a weak nature from her father.

This is an instructive history, as the husband begat two healthy children when he was not a smoker, and after he began smoking his wife had two miscarriages.

Case 25.—The following is the family of a moderate smoker :

1. Girl, now married.
2. Boy, died at 9 months.
3. Girl, now married.
4. Girl ,,
5. Girl ,,
6. Girl, premature, lived 24 hours.
7. Girl, now married.
8. Girl, living.

Then followed three miscarriages ; the mother is now fairly strong and active ; her mother lived to 80 ; her father was a moderate smoker ; he had four sons and five daughters. The father is wearing out quicker than the

mother; she inherits a strong will and sound body from her mother. All the children were breast-fed. No abscess of breast.

Case 26.—The following is the family of a miner, who has smoked three ounces of tobacco a week for many years:

1. Boy, died at 4½ years; born in December 1879.
2. Boy, now married.
3. Boy ,,
4. Boy ,,
5. Girl, living.
6. Boy, died of phthisis at 23 induced by smoking cigarettes.
7. Girl, living.
8. Boy ,,
9. Girl ,,
10. Girl ,,
11. Boy } twins; both died under 12 weeks.
12. Girl }
13. Girl, living; born in June 1896.

The first eight children were breast-fed. The mother suffered from abscess of breast with her ninth child, and was obliged to give up suckling with that child and all who followed; she had easy confinements; no miscarriages.

Case 27.—The following history was given me by a widow, who is far above the average in intellect and moral courage; her father did not smoke or drink; her husband gave way to excessive abuse of alcohol and tobacco, and neglected his wife and children; he died of paralysis at the age of 64; his children were:

1. Girl, married.
2. Boy, died in third week.
3. Boy, premature, died at 12th month.
4. Girl, living.

No miscarriage; had abscess of right breast while suckling one child. It appears that the boys possessed less vitality than the girls; probably they inherited more of the father's nature than the girls. The girls were vigorous and survived, because they inherited more of the mother's than the father's nature.

Case 28.—The history of a brave, honest and hard-working sailor, age 56; he had eight brothers and six sisters. His father did not use tobacco. He joined the merchant service, endured many hardships, and was once shipwrecked. He began to smoke at 21, and has smoked as much as one and a half pounds of cake tobacco a month; he has abstained from alcohol all his life. He believes that indulgence in tobacco was a safeguard against the temptation to drink. He first married at 24, his wife bore three children, and died of internal inflammation. He took a second wife, a Christian woman and life-long abstainer from alcohol. She bore the following:

Miscarriage at sixth month. Miscarriage at second month.

1. Boy, died of convulsions in infancy.
2. Girl, ,, ,, ,,
3. Boy, died of acute otitis at 18.
4. Boy, now living and healthy.
5. Girl, ,, ,,

The wife enjoyed good health before marriage. Her husband has been working as a mason for many years, is a steady and prudent man, but smokes to excess. Why did the wife have two abortions? I suspect that the two ova were poisoned with nicotine. I know the mother was a healthy woman; she ceased bearing at 37; for the last two years she has suffered from menorrhagia and frequent headaches.

Case 29.—The following history was given to me by Mrs. D. She was married at 23; her father was no smoker; he died at 70; her mother died at an advanced age; they left four sons and eight girls. Mrs. D. had the following children:

1. Boy, grew up; was killed by accident.
2. Girl, now living.
3. Girl ,,
4. Boy, died in fits at 8 months; the mother had abscess of breast.
5. Girl, died in fits at 8th month; then followed three miscarriages.

Her husband is a heavy smoker, and he often smokes in his home in the same room with his wife; she often

suffers from headache, with depression of spirits and loss of appetite. I regard her illness as the result of inhaling tobacco smoke.

Case 30.—Q. is the father of a large family; his father was a farm labourer, drank beer and cider, and was a great smoker and chewer. Q. developed asthma at 11, after a while it got better, but returned badly at the age of 21; at that time he smoked over an ounce a week. He married at 21, his wife was 24, her family was phthisical. His asthma became worse after his marriage. At the age of 26 he came to live in Torquay, he improved, but attacks recurred from year to year. His wife bore the following:

1. Boy, born 1871, now living.
2. Boy, ,, 1873, died May, 1876.
3. Boy, ,, 1875, died 1881.
4. Boy, ,, 1877, now living.
5. Boy, ,, 1878, ,,
6. Boy, ,, 1881, ,,
7. Girl, ,, 1883, ,,
8. Girl, ,, 1885, ,, } Twins.
9. Girl, ,, 1885, ,, }
10. Boy, ,, 1887, ,,
11. Boy, by his second wife, born 1893, now living.

The first wife died at 43. Q. now only smokes one pipe a day. His father had four boys and two girls. The two generations produced twelve boys and five girls.

Case 31. I know three generations of this family. The father is about 60, a heavy smoker. The mother is in good health; she was 21, and he was 22 at the time of marriage. She had the following children:

1. Girl, died in fits eleven days after birth.
   After an interval of fifteen months the mother bore:
2. Girl, healthy, but not fat.
   After an interval of eighteen months she bore:
3. Boy, had no fits, he grew up strong.
   After an interval of three years:
4. Girl, she has grown up a fine woman, as tall as her mother, and has three girls.
5. Girl, still born at sixth month.

6. Girl, just before her birth her mother was much excited; the babe was born paralysed on one side, and was subject to fits till the age of 3, when she died.

No poverty or hardships.

Case 32.—History of a woman who died of cancer of the womb; her husband has been and now is a heavy smoker, but not a drinker; his wife bore the following:

1. Girl, born in 1873, now married.
2. Girl, born in 1875, now living.
3. Girl ,, 1881 ,,
4. Boy ,, 1885 ,,
5. Girl ,, 1896, only lived 2 years; she was feeble at birth.

In 1897 there were signs of cancer of the womb, and she was sent up to St. George's Hospital; no operation was performed, and she returned home; the disease continued to increase, and there was frequent hæmorrhage and pain; she died in 1909.

I am told she had about ten miscarriages, and that six occurred after the birth of the last child.

Case 33.—Mrs. X. is the daughter of a non-smoker, a farm labourer, who enjoyed good health to the age of 78, and kept at work till that age; he is now able to walk about at the age of 83; he had two sons and three girls. Mrs. X. is a good-looking woman of superior intelligence; she married at 22; she had the following:

Miscarriage.
1. Girl.
2. Boy.
3. Girl.

Then she waited ten years, during which she had two miscarriages, and bore:

4. Girl.

All her children are living; the son is a strong man above the average size; she had three miscarriages in all, and with her last child had an abscess of the breast. She says her husband is only an "occasional smoker," which statement I regard as lenient towards the husband. All the children were breast-fed.

Case 34.—Mr. O. is about 75; he has smoked about one ounce of tobacco a week for many years; he suffers from chronic bronchitis and dimness of sight.

His wife is still in good health; she has borne four sons and eleven daughters; nine are now living; one died under 5 years; she had two miscarriages, one near the change of life.

Case 35.—H. is a man about 40, of good appearance, prudent and careful in his living, except in the use of tobacco; he began to smoke at 12; he married at 20; the wife was 19.

In the second year a boy was born, who is now 20.
Later on a second boy was born, who is living.
Then followed a miscarriage, and after that a still-born boy.

Both boys were breast-fed. The wife has been sterile for many years, and must now be nearly 40. The father now smokes three ounces a week; his eyes are dull; his cheeks are of a deep red colour, not a natural colour; he suffers occasionally from vertigo.

I know of no other disabling or sterilising agent in this case but tobacco; the wife is a healthy woman, but she is partly sterile. His father used to smoke and drink till about middle life, when he was "converted and gave up the drink and tobacco." He had three sons and five daughters.

Case 36.—I have known the husband and wife for several years. The husband comes of a healthy stock, his mother is a fine specimen for her age; he is a well set up man, 43 years of age, works in a quarry, he smokes about half-an-ounce of tobacco a day; he married at 28 a well-built woman of 27, who was active and prudent; she worked in a laundry before and after marriage; she took care of herself when pregnant for the first time, but was confined at the eighth month of a dead female child. The same fate overtook her in the second, third, and fourth pregnancies. She noticed slight oozing of blood from vagina constantly during all these pregnancies. She felt a change take place in her womb two weeks before her delivery in each pregnancy, and she knew it was a sign of death of fœtus. She was so distressed at bearing these

four dead female infants that she consulted Dr. Ramsay of this town. He asked her if she wanted to bear a live child, and she answered "Yes." He said she was to take two pills, and gave her an assurance she would have a child. She went away and took the pills (two in number); she did not alter her habits in any way; in due course she became pregnant for the fifth time, and bore a girl, who was fed on the breast and became a strong child; she died of diphtheria at the age of 12.

Her sixth was a girl; seventh was a girl; eighth was a boy; ninth a girl. They were all breast-fed and are now healthy.

There is no explanation of any kind to account for the first four infants dying before birth. Apparently they died of disease, as there was no accident to account for death. Was the disease derived from the mother? she was in good health during each pregnancy and went out to work all the time. It appears impossible for the child to have been infected by the mother, unless she had inspired tobacco smoke in the atmosphere or had absorbed exhalations from her husband's body containing poisonous products of nicotine, etc.

If we do not accept this last theory we must fall back on the theory that each ovum was poisoned by tobacco at the time of fertilization, and that growth was satisfactory till the eighth month, when it ceased. I think this theory is untenable, for I don't think a poisoned ovum could develop normally to such a late period as the eighth month. I do not wish to dogmatize, but is it unreasonable to suspect indirect poisoning of a healthy fœtus at the eighth month from the poison of tobacco in the mother's blood? There are two defects in this family, both of which are strongly characteristic of a tobacco toxin: the four still-born children, and the ratio of eight female births to one male.

A Sterile Marriage.

Case 37.—The history of a man who has driven a cart all his life. He married when he was a young man; he began to smoke at 18, and has been smoking half-an-ounce of tobacco a day for years and years. His wife has had no child and no miscarriage; he is now 67.

Case 38.—The husband is a shoemaker, who smokes two or three ounces a week; his wages are hardly enough to provide for the wants of his family; his wife is an active woman of pale appearance; she was married at 20; her mother lived to 72; her father has always smoked heavily and is now 78. She has borne the following:

1. Girl.
2. Girl.
3. Boy.
4. Girl.
5. Girl.
6. Girl.
7. Girl.
8. Girl.
9. Boy, now 4 months old and doing well.

The mother is now 40; she has had no miscarriages and no abscess of breast. All the children have been fed on the bottle. The eldest girl is anæmic and neurotic.

The mother may inherit a tobacco taint from her father, but her husband's blood is very impure, and all his children are anæmic.

Case 39.—Mrs. B. C. is a thin, active woman who married at 21; her father "smoked a little," and died of consumption about the age of 50; her mother is still living. Her husband smokes two or three ounces a week. She has borne the following:

1. Girl, living.
2. Boy, killed by accident while at play.
3. Boy, living.
4. Boy ,,
5. Boy ,,
6. Boy, died under 5 years.
7. Boy ,, ,,

No miscarriages, no abscess of breast; all the children were breast-fed. Two of her sons are in the police force.

Case 40.—Mrs. B. says her husband has been in the habit of smoking two ounces a week; he is now 58; she was married at 28.

1. Boy, now living
2. Girl, died at 2½ years from measles.

3. Boy, now living.
4. Girl, „ „

The eldest son was a sharp boy, but developed insanity at 17, was placed in an asylum and kept there for eleven months; he now lives at home and works as a gardener; he is subject to strange moods and depression; he never took alcohol or smoked. The mother miscarried at third month before her first child was born; the mother now suffers from phthisis.

Case 41.—Carpenter, age 70; his wife was 26 at her marriage, and of a good constitution; he was 25; he has smoked two ounces a week or more: his children were:

1. Boy, now living.
2. Girl, „
3. Boy, „
4. Girl, „
5. Girl, „
6. Girl, „
7. Boy, lived 18 months, died in convulsions.
8. Girl, living.
9. Girl, „

No miscarriage or abscess. The wife had post-partum hæmorrhage in her last confinement, and was in bed six months, and then was laid up with chronic rheumatoid arthritis; she died at 69, after five years of suffering. All the children were breast-fed. The father has suffered for more than a year from cardiac trouble.

Case 42.—This is the history of a woman, age 50, who has been an abstainer from alcohol for 24 years; her father was not a smoker, he lived to 84; her mother lived to 60; they had five sons and five daughters, who grew up healthy. At 25 she married; her husband was 27; he is a heavy smoker and drinks beer; he is rather bloated and corpulent. She became pregnant soon after her marriage; two weeks before her confinement, while in bed, she was seized with convulsions, and remained unconscious for two days. She had a tedious labour and bore a son whom she suckled; he is now 24; he is the only child. She is strong, but often suffers from headache and depression, especially at the menstrual periods.

Case 43.—The history of a steady labourer who usually smoked an ounce of tobacco a week, and took one or two glasses of beer a day. His wife is now 48; she is strong and of large frame, and works in a laundry; she suffers from varicose veins: she was married at 21, and has borne the following:

1. Girl, died at 12th month, effects of measles.
2. Boy, now living.
3. Boy, died of phthisis at 18.
4. Boy, now living.
5. Boy, died at 1 year from measles.
6. Girl, now living.
7. Boy, now living. The mother bore this boy in her fortieth year.

She has had two miscarriages; she suffered from a severe attack of enteric fever ten years ago; she never had an abscess of the breast. All the children were breast-fed.

Case 44.—N. was a sailor, and a good husband and father; he gave up work about the age of 40, owing to asthma and heart trouble; he died at 50; his widow is a stout, healthy, active, kind-hearted, motherly woman; she was married at 22; she bore the following:

1. Girl, married, two children.
2. Girl, „ „
3. Girl, „ no child.
4. Girl, died at 2½ years.
5. Girl, married.
6. Girl, living.
7. Boy, living, resembles his father in physique.
8. Boy, died under 5 years.
9. Boy, had fits soon after birth, and is now a confirmed epileptic.
10. Boy, died under 5 years.
11. Girl, living.
12. Boy, „
13. Boy, „

The mother had no miscarriage or abscess; she suckled all her children, and took good care of them; she took no alcohol, nor did her husband; he smoked much. The boys are small and resemble their father. The girls resemble their mother, and are good tempered and robust.

Case 45.—This case supplies direct evidence of the poison of tobacco, causing inflammation of the tongue. A man, age 52, has worn spectacles for 23 years, had good sight as a boy, has been teetotaller many years. He came to me two years ago, with chronic pharyngitis, causing cough. I advised him to give up smoking, but he continued to do so till three months ago, when the condition of his tongue was so painful that he grew alarmed and stopped smoking; he used to chew tobacco; his teeth became "rotten" many years ago, and he had the stumps drawn; he has no teeth in upper jaw, and only three incisors in the lower; his sight began to fail at the age of 26. There is a large white patch in the centre of the tongue, glazed like polished stone, very sensitive to vinegar, etc. He has been married many years, but has no children.

Case 46.—Mrs. N. is a stout, healthy woman about 45; her husband was a plasterer. At the age of 49 he was apparently in good health, when he was suddenly seized with left hemiplegia; he fell down with no warning; his wife was married at 20; she bore the following children;

1. Girl, living.
2. Boy, „
3. Boy, „

} These three children were born within two and a half years.

4. Boy, was born after 2½ years; he died. A miscarriage at second month.
5. Boy, born after two years.
6. Boy, born after three years.
7. Girl, „ „
8. Boy.

All the children are living but one. No abscess of breast. All were breast-fed. The intervals between the births of the first three children were very short. This is the only defect in this history.

Case 47.—Shopkeeper, age 60, had two brothers and no sisters; he has smoked in moderation, has always been moderate in the use of alcohol; he has occasionally been depressed; he suffers from a rupture; he weighs over fifteen stone; (his father was an habitual smoker); he married at 24; his wife was 26; she has enjoyed good health and bore the following:

1. Boy, living.
2. Girl, „
3. Girl, „
4. Girl, „
5. Girl, „
6. Girl, „
7. Boy, now 21.

All breast-fed; no miscarriage, no abscess of breast. They have all prospered in business.

Case 48.—*A moderate smoker.* The father and mother were married in September, 1881, they are both living and healthy; he was 25 and she was 19 at the time of their marriage; she has borne the following:

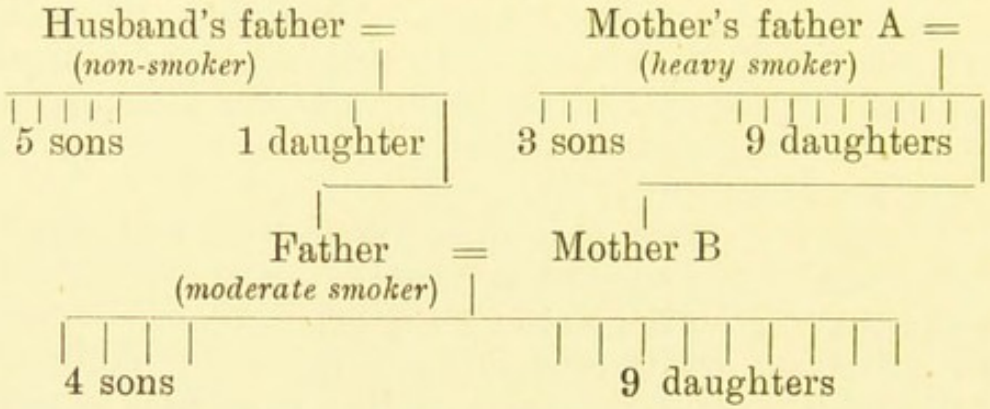
1. Boy, born 16th July, 1882.
2. Girl, „ 19th December, 1883; lived two days.
3. Girl, „ 19th March, 1885.
4. Girl, „ 27th November, 1886.
5. Girl, „ 12th September, 1888.
6. Girl, „ 13th August, 1890; lived four months, (abscess of breast).
7. Girl born 1st October, 1892.
8. Girl, „ 8th February, 1894.
9. Boy, „ 6th September, 1896.
10. Girl, „ 3rd July, 1898.
11. Boy, „ 3rd September, 1899.
12. Girl, „ 11th February, 1902.
13. Boy, „ 19th May, 1906.

One miscarriage. All the children were breast-fed. The mother is a tall, healthy, good-tempered woman. The parents and grand-parents are sober.

The natural excess of boys to girls is reversed in this family. We see the births of nine girls and four boys. The explanation of this peculiarity is revealed by further inquiry into the parentage of the mother who had a family which consisted of nine girls and three boys, and it is obvious that she transmitted this tendency to the daughter whose history I am relating. Where did this abnormal tendency arise? My reply is that this abnormality may be commonly noticed among the families of the daughters or wives of heavy smokers. The father of my patient has always been a heavy smoker, and he still smokes at the age

of 80. Perhaps his father and grandfather were also heavy smokers. It is remarkable how closely these two families resemble each other in their numbers and sexes. The mother had nine girls and three boys, and her daughter had nine girls and four boys; the father of this last family is a moderate smoker, and is the son of a non-smoker, who had five sons and one daughter, therefore the abnormal tendency is not on his side. (*See table*).

TABLE TO EXPLAIN TRANSMISSION OF TOBACCO TAINT.



"B" is the mother of the children in my list. I have explained my reason for believing that she inherited the abnormal fecundity in female children from her parents; her father "A" was a heavy smoker. Note that "B's" husband was a moderate smoker, and was the son of a non-smoker, who had a normal family of five sons and one daughter. The two families tainted with tobacco had an aggregate of seven sons and eighteen daughters.

I can only explain the excess of female infants in these two families on the theory that the wives and daughters of heavy smokers conceive and mature female infants in a larger proportion than males. This shows an abnormal state of the generative functions, and must lead to a serious inequality of the sexes.

CASE 49.—F. was a strong, tall man, a platelayer; he used to smoke five ounces of tobacco a week. His wife bore the following:

1. Girl, married, aged 45; the mother of three boys and four girls.
2. Boy, married, now 41; he smokes "a lot"; his wife died of puerperal fever in her first confine-

ment, nine months after her wedding; the babe (a boy) died after six months.

3. Girl, married; mother of three boys and one girl.
4. Boy, now 33, married; father of one boy and one girl.

The father and mother of these four children are now dead. The father was a stout man and once weighed fifteen stone, but decreased to eleven stone: he suffered from diabetes, and died suddenly at the age of 69. The mother had a tumour (ovarian ?) and was tapped thirteen times; she died at 60.

A family of only four children is below the normal standard. The youngest son is a steady man, but suffers from a weak heart.

Case 50.—D. has been an industrious and temperate man and a smoker. His wife has been a healthy and temperate woman; she bore two boys and three girls; normal confinements, one miscarriage, no abscess. The husband was smitten with left hemiplegia at the age of 60. All children were breast-fed.

Case 51.—H. is a married woman of a neurotic temperament, age 42. All her molars have dropped out, her gums have shrunk; she was married at 27, husband was 24; he has been a heavy smoker. She enjoyed good health till her first pregnancy; her first child was a boy, who had fits for several weeks after birth; she was unable to suckle him; he is delicate; his teeth are irregular and carious. Ten months later a girl was born; she is fairly strong, and is taller than her brother; she has a good set of teeth. The mother has had no further conceptions.

Case 52.—The husband was once in the Navy, he is a heavy smoker, and liable to disturbance of the heart. His wife is a fine woman, with large bosoms; she has borne five boys and four girls. One of the boys died from sucking matches; one girl died of bronchitis under 2 years; one boy is very wayward, reckless, and excitable.

Case 53.—The following history was given me by one of the daughters, and who had a babe that I attended for convulsions. Her father kept a brush factory, he used to smoke half an ounce of tobacco daily; he was so given to

drink that he lost his business; he died in fits at 54. His widow is now living and healthy, she bore: four sons, thirteen daughters; three of the sons died under 6 months, and one lived to 3 years; ten of the daughters were reared, three died under 5 years.

The fact that four boys died so young supports my theory that the tobacco poison in the father's blood had a stronger blighting or devitalising effect on the boys than the girls. The mortality among the girls was high, but the fact remains that ten survived.

Case 54.—The family of a plasterer who is still living; he was a teetotaler for many years, and has smoked over half an ounce of tobacco a day for many years; the money which he spent this way deprived the children of food at times. His wife was very strong, and worked hard to provide a good home; her heart gave way under the strain, and she passed away very suddenly. An inquest was held, and a verdict of death from heart disease was returned. She had four sons and six girls, two of the girls died under 5; all the children were breast-fed. The mother died at 63.

Case 55.—H. is a man now 41; his father was a tall big man, both a drinker and a smoker; he had six sons and one daughter, who died of consumption; he died of heart disease at 61, and his wife brought on her illness by hard work, and died at 59. H. began to smoke early, both pipes, cigars and cigarettes; he married at 24; his wife was then 23. The wife comes of a delicate family, and is cachectic. She has two brothers living, but no sisters; her mother bore three still-born sons, and three still-born girls; she is still living and has all her faculties, age 78. H. was married the 11th August one year, and a girl was born the following July; a boy was born two years later; he is now 14; they are both delicate and anæmic; the father suffers from chronic tubercular disease of the lungs and has lost the sense of smell; he is often depressed; he has almost given up tobacco at my advice.

Case 56.—In May, 1908, I examined a labourer, age 42, of healthy parentage; his mother was living, age 82; he is a well-made man, with good features, about 5ft. 10in. in

height. He married at 21; his wife was 26; she is healthy and strong and has had six children; of these two died in infancy.

Before his marriage he was a good runner and excelled in manly sports. He has worked in a brick factory under one firm for a number of years; his wages averaged from eighteen shillings to twenty shillings per week; sometimes he drank a pint of beer an evening, but rarely got intoxicated, but he smoked half an ounce of tobacco a day for a number of years; his favourite smoke is known as "black twist"; he confesses to this, and is said to have a pipe in his mouth all day long, even at his work; he commenced smoking at 14. He was first seized with a fit while at work at 7.30 a.m. about two years ago; he was carried home unconscious and kept his bed for a few days, and was then admitted to Torbay Hospital; there he was kept in bed for one week, and then was so far recovered that he was directed to take exercise in the garden. At the end of another week he was well enough to return home.

During the last eighteen months the fits have increased in frequency. He was under the care of his Club Doctor before he came to me, and he lost about nine months work in eighteen months. He states that he has often been seized with sudden loss of power in his legs for a second or two; sometimes he has held himself up by clinging to a railing, and sometimes he has fallen down, but rarely lost his senses. During the past week he has fallen down several times, and after a few minutes he has recovered and continued his work. He is slow of speech.

He has a nervous manner, and is reserved in speaking of his illness. His wife induced him to come to me, and they walked together a distance of over a mile to my house. I could find no history of syphilis, and nothing to cause his illness but tobacco; I therefore advised him to cease smoking. He suffers from distress of heart if he tries to walk quickly. I have never seen him in a fit, but his wife was able to describe them to me; they vary very much in severity, some last only half a minute or less; he falls down on his back suddenly and loses his senses.

He had a severe fit in his sleep a few nights ago; his wife was roused by a loud gurgling noise in his throat; his eyes were fixed; he was unconscious; his whole body was convulsed; he has never received an injury to the head;

his face is marked with patches of dusky redness ; his expression is dejected, eyes have a weary anxious expression, tongue is covered with a yellow brown fur ; lower teeth are much worn at the edges ; many are missing, all are blackened. Hands are tremulous, he requires both hands to hold a cup ; he has difficulty in reading a newspaper, the sight failing ; pulse is excited, regular 88 ; heart's impulse is increased, first sound is intensified ; bowels confined. The state of the capillaries of the face is probably an indication of the state of the capillaries in the brain and spinal cord. The fits were secondary to vascular changes.

His manner was quite different to that of a sufferer from alcohol—he was like a man in a reverie, and assented without a demur to my advice to reduce his smoking. He was quite unconscious in some of his fits, and had no recollection of them. The fits continued frequently during the following month ; he became worse, and was eventually removed to the Workhouse Infirmary. I did not see him again till January, 1911 ; he had grown thinner and older looking, was more tremulous, and his hair had turned white. He seemed to suffer in many ways from his chest and stomach, he complained of sleepless nights ; his only comfort was his pipe, which he smoked out of doors. He was allowed a little tobacco while in the Workhouse, but no beer or spirits.

I am of opinion that the coats of the arteries had undergone fatty degeneration, and produced these fits. The early age at which he commenced smoking accounts for the early appearance of arterial degeneration and nervous tremor. The small amount of beer that he took could not have produced these changes.

This case has a resemblance to one published by Doctor R. O. Moon, in the *Medical Press and Circular*. 1 March, 1905. His patient had been smoking an ounce of shag a day. He suffered from sudden seizures, in which he fell prostrate like a man in a faint, but when carefully observed, slight spasms were noticed ; the pulse rate varied between 26 and 36. He improved by reducing the smoking to one pipe a day. The fits first appeared at the age of 58; he complained of pains round the heart, flatulence, and fainting fits.

My patient was married in 1887, his wife bore the following:

1. Girl, a healthy babe, was unable to grasp the nipples in her mouth because of their small size, so she was fed on the bottle. She died in fits at 4 months.
2. Boy, born fourteen months later, he is now in the Navy. He has often tried to smoke, but it has always made him ill.
3. Boy, born three years later, has smoked a little, and suffered much.
4. Girl, now 14, born four years later.
5. Boy, born five years later.

One miscarriage.

The husband followed his occupation regularly until he was 39 or 40, when he began to suffer from giddiness which slowly increased, and gradually developed into fits. He is now supported by the efforts of his wife.

Case 57.—G. is a labourer, who smoked to such an extent that he became insane, and was put under treatment in an asylum. After a time he recovered, and was sent home.

His wife has borne six sons and two daughters, one son died at birth, and one died in the third month. The two daughters are living, one has been married three years, and has had no conception, she is anæmic. The mother was 34 at her last confinement, and suffered from inflamed veins of one leg. She is now in poor health, so is her husband.

ABSTRACT II.

Abstract of Cases among Smokers. Class 2.

Case	Born living — M.	Born living — F.	Died under 5 years — M.	Died under 5 years — F.	Still-born — M.	Still-born — F.	Miscar-riages	Abscess of Breast	Sets of Twi-ns
1	7	5	1	—	—	—	2	2	—
2	3	4	1	—	3	—	—	—	1
3	6	6	1	2	—	—	—	—	—
4	—	2	—	—	—	—	9	—	—
5	6	—	1	—	—	—	2	—	—
6	1	4	—	—	1	—	—	—	—
7	4	4	4	—	—	—	1	—	—
8	3	1	2	1	—	—	—	—	—
9	1	3	—	1	—	—	1	—	—
10	3	10	—	5	—	—	—	—	—
11	3	8	—	—	—	—	—	1	—
12	7	5	2	—	—	—	1	—	—
13	3	7	3	2	—	—	6	2	1
14	2	6	2	4	1	1	1	—	—
15	2	4	1	3	—	—	—	4	—
16	2	4	—	2	—	2	—	1	2
17	1	—	—	—	—	—	—	—	—
18	4	2	2	—	1	—	—	—	1
19	3	2	1	—	—	—	—	—	—
20	1	4	1	—	—	—	—	—	—
21	8	2	3	—	—	—	—	—	—
22	4	3	—	—	—	—	2	—	—
23	4	3	2	—	—	—	1	1	—
24	1	1	—	—	—	—	2	—	—
25	1	7	1	1	—	—	3	—	—
26	7	6	2	1	—	—	—	1	—
27	2	2	2	—	—	—	—	1	—
28	3	2	1	1	—	—	2	—	—
29	2	3	1	1	—	—	3	1	—
30	8	3	1	—	—	—	—	—	1
Car. on	102	113	35	24	6	3	36	14	6

ABSTRACT II.—CONTINUED.

ABSTRACT OF CASES AMONG SMOKERS. CLASS 2.

Case	Born living — M.	Born living — F.	Died under 5 years — M.	Died under 5 years — F.	Still-born — M.	Still-born — F.	Miscar-riages	Abscess of Breast	Sets of Twi-ns
Brot. up	102	113	35	24	6	3	36	14	6
31	1	4	—	2	—	1	—	—	—
32	1	4	—	1	—	—	10	—	—
33	1	3	—	—	—	—	3	1	—
34	4	11	—	1	—	—	2	—	—
35	2	—	—	—	1	—	1	—	—
36	1	4	—	—	—	*4	—	—	—
37	—	—	—	—	—	—	—	—	—
38	7	2	—	—	—	—	—	—	—
39	6	1	2	—	—	—	—	—	—
40	2	2	—	1	—	—	1	—	—
41	3	6	1	—	—	—	—	—	—
42	1	—	—	—	—	—	—	—	—
43	5	2	1	1	—	—	2	—	—
44	6	7	2	1	—	—	—	—	—
45	—	—	—	—	—	—	—	—	—
46	6	2	1	—	—	—	1	—	—
47	2	5	—	—	—	—	—	—	—
48	4	9	—	2	—	—	1	—	—
49	2	2	—	—	—	—	—	—	—
50	2	3	—	—	—	—	1	—	—
51	1	1	—	—	—	—	—	—	—
52	5	4	1	1	—	—	—	—	—
53	4	13	4	3	—	—	—	—	—
54	4	6	—	2	—	—	—	—	—
55	1	1	—	—	—	—	—	—	—
56	3	2	—	1	—	—	1	—	—
57	6	2	2	—	—	—	—	—	—
Tot.	182	209	49	40	7	8	59	15	6
	391		89						

*premature.

CHAPTER XII.

TABLES OF COMPARISON BETWEEN NON-SMOKERS AND SMOKERS IN RATES OF MALE AND FEMALE INFANTS: CONCEPTIONS; ABORTIONS; STILL-BIRTHS; RATIO OF ABORTIONS AND STILL-BIRTHS TO LIVE BIRTHS; MORTALITY IN FIRST FOUR YEARS OF LIFE; ABNORMAL CONFINEMENTS; ABSCESS OF BREAST; EXPLANATIONS OF THE CAUSES OF DIFFERENCE; SUMMARY OF DEFECTS IN CLASS OF SMOKERS.

"He that will not reason, is a bigot;
He that cannot reason, is a fool;
He that dare not reason, is a slave."

In this chapter I shall review and compare the two Abstracts based on the complete genealogical histories of thirty-eight fathers non-smokers, and fifty-seven fathers smokers. I will then offer my opinion as to the cause, or causes, of the defects in Class 2 when compared with Class 1.

TABLE I.

BIRTH RATES OF NON-SMOKERS. CLASS 1.

The wives of 38 non-smokers bore 280 living children during their entire conceptive periods, consisting of	149 M.	
	131 F.	
Excess of males		18
This represents a rate of 7,368 children to 1,000 wives; the proportion of the sexes would be	3,921 M.	
	3,447 F.	
Excess of males, 474		7,368

The average number of children to each family is over 7. The usual way of expressing the ratio of the sexes in official reports of birth-rates is to show the number of males born to every 1,000 females born. The ratio in this Class is 1,137 M. to 1,000 F. at birth. This Class shows a high degree of fertility and a good proportion of male and female infants.

TABLE II.

BIRTH RATES OF SMOKERS. CLASS 2.

The wives of 57 smokers bore 391 living infants during their conceptive periods ...	182 M. 209 F.
Excess of females	27
This is equal to a rate of 6,859 children to 1,000 wives, in the proportion of	3,193 M. 3,666 F.
Excess of females, 473	6,859

TABLE III.

Birth rate of non-smokers	7,368 M. & F.
Birth rate of smokers	6,859 M. & F.
Loss to smokers	509

TABLE IV.

Birth rate of non-smokers ...	3,921 M.	3,447 F.
Birth rate of smokers	3,193 M.	3,666 F.
	−728	+219

This comparison proves two strange defects in Class 2 when compared with a normal birth rate, Class 1, a loss of 728 males, associated with an excess of 219 females. If the excess of females be deducted from the loss of males the remainder represents the net loss. Thus : 728 M.
219 F.

(See Table III). 509

The defects of the birth-rates among smokers are most perplexing when they are thus revealed. We find the wives of smokers were unable to produce as many male infants as the wives of non-smokers, but by some law which we cannot explain, they were unduly fertile in female births. The inability to produce a normal number of males is a serious defect, and constitutes a measure of sterility affecting the male sex; but the evil is intensified, being associated with an actually abnormal number of females. This deficiency of male infants is accurately represented thus: for every 1,000 females born, there were only 870 males; compare this with Class 1, 1,137 M. to 1,000 F.

Everyone will admit that this is an abnormal ratio of the sexes, and constitutes a morbid state. It is highly desirable, if possible, to learn whether the defect originates in the fathers or in the mothers.

I can confidently state that there was no difference whatever in the physical or mental condition of the mothers of Class 2, from those in Class 1; they are of the same race; they lived in the same town, under the same conditions; subject to the same privations and accidents, and derived their food and drink from the same sources; they were, in all respects, as healthy as those in Class 1 *before* marriage. If the defect did not arise among the mothers, it must have arisen among the fathers. The fathers in Class 2 are of the same race and were in all conditions, like those of Class 1, except *one*; they smoked tobacco habitually, some indeed of them using an ounce a day.

These defects cannot be attributed to chance or local peculiarities, to idiocyncrasy or consanguinity, for the marriage customs are similar in both Classes. I have taken great care in preparing my Tables, and I feel convinced that there was an initial poisoning of the ova of Class 2, which so acted as to cause an inversion of the ratio of sexes at birth, leading to an excess of female over male births.

I have discovered that the families in which the excess of females is highest belonged generally to the heaviest smokers. This series of cases points to the existence of a law, that the wives of heavy smokers cannot produce a

normal number of males, and have an excess of females, not only a relative, but an actual excess when compared with a healthy standard.

Table V.

Conception.

When an ovum is fertilized, conception or impregnation occurs. It is possible to calculate the total number of impregnations in each Class by first taking the number of live-born children in each Class, and adding all the miscarriages and still-born infants together; the aggregate will show the total number of conceptions, and the proportion of fœtuses which died before reaching maturity.

Class 1.	
Miscarriages	394
Still-born	210
Live-born	7,368
Total	7,972
Class 2.	
Miscarriages	1,035
Still-born	263
Live-born	6,859
Total	8,157

This Table shows that the wives of the smokers had 185 more conceptions than the wives of the non-smokers, but that owing to a higher rate of mortality in the fœtuses, they had a lower birth rate of mature infants, the deficiency being 509 infants. If virility is defined as the power of procreating children, then this Table clearly indicates that the men in Class 2 possessed less virility than Class 1. The number of live-born children is regarded as the proof of virility. Class 1 had the higher birth-rate, therefore it is correct to assume that the class of smokers had lost some degree of virility. This Table clearly shows that the low birth-rate among the wives of the smokers was not due to want of fertility among the wives, as they had a larger number of conceptions than the wives of the non-smokers.

Table V.

Miscarriages ; Abortions.

In order to avoid confusion, I will define these terms. I have adopted the terms as they are used in "Playfair's Book on Midwifery." He used the terms miscarriage and abortion as synonymous. He wrote as follows: "It suffices to apply the term abortion or miscarriage indiscriminately to all classes in which pregnancy is terminated before the fœtus has arrived at a viable age, and premature birth to these in which there is a possibility of its survival. There is little or no hope of a fœtus living before the twenty-eighth week, and this period is therefore generally fixed on as the limit between premature birth and abortion."

I find it impossible to follow this rule with absolute accuracy in taking histories, because women always calculate the stages of pregnancy by months and not by weeks. A woman usually remembers the month at which she has miscarried, and my histories usually give the period by months. A woman will know whether she has lost a child at the sixth or seventh month, but she will probably describe the loss in both cases as miscarriage, though the latter, according to classification, should be termed a premature birth. In the case of dead-born infants, it is of no consequence from my point of view, whether the death occurred at the sixth month or the seventh month. In the former case, it should be classed as an abortion, and in the latter as a still-born male or female. The distinction between the two classes is abitrary, and only adopted for purposes of classification. I shall now drop the use of the word miscarriage and keep to the word abortion. The number of abortions which occur in the general population can never be reckoned. No record is kept in this country of abortions or still-born infants. The latter are officially recorded in France and many other countries. Some interesting facts may be obtained by a comparison of the number of abortions and dead-born children among the wives of the non-smokers and smokers.

As there is no object to be gained by discussing the causes of abortion and still-birth separately, I shall include both in one Table, and discuss the causes of both in one enquiry.

TABLE VI.

	Live-born.	Abortions.	Still-born.
In Class 1, to 38 mothers	... 280	15	8
In Class 2, to 57 mothers	... 391	59	15
Totals	... 671	74	23
		97	
Rate for 1,000 wives, Class 1.	7,368	394	210
,, ,, ,, 2.	6,859	1,035	263

TABLE VII.

LOSS OF FŒTAL LIVES.

CLASS 1.

Abortions	394
Still-born	210
Total	604

CLASS 2.

Abortions	1035
Still-born	263
Total	1298
Excess in Class 2	694

Table 7 proves that the wives of the non-smokers had a loss of fœtal lives equal to a rate of 604 in 1,000 wives; and that the wives of smokers had a loss of fœtal lives equal to a rate of 1,298 in 1,000 wives. How can the excess among the latter be explained?

The wives in Class 2 were as healthy as those in Class 1 before marriage; they were on a par with the wives in Class 1, in all respects but one; they were exposed to the poison of tobacco, directly and indirectly, being the wives of smokers. None of the husbands in Class 2 were in any respects inferior to those in Class 1, except as a consequence of indulgence in tobacco.

The Medical and also the Lay reader may perhaps be astonished that I should attribute the great excess of fœtal mortality in Class 2 as the direct consequence of the action of tobacco on the developing ovum; this excess is so very large that it indicates a very large amount of poison in this Class 2. We can only speculate as to the

immediate cause of the death of an ovum; we can, however, safely say that in the absence of an accident or injury, the death must be due to the effect of disease or poison conveyed by the father or the mother. There is no reason to consider that the fœtal losses in Class 1 are above the average among a class of non-smokers. My knowledge of husbands in Class 1 enables me to exclude syphilis, tubercle, alcohol, and lead-poisoning as possible factors. As they were, in all respects, healthy men, I do not consider any of these losses as due to paternal defects; I am, therefore, bound to consider all the fœtal losses in Class 1 as due to causes affecting the mothers; I can exclude syphilis, alcohol, tubercle, and lead-poisoning as possible factors among the mothers; thus leaving a large class of well-known causes as factors, such as incidental illness, exhaustion from overwork, want of food, prolonged lactation, anxiety, grief or mental emotion, and lastly, excessive coitus.

I have thus explained the various possible causes of the loss of fœtal lives among the wives of non-smokers. If in Class 1 maternal influences, such as I have indicated, caused a loss of 604 fœtal lives, it is reasonable to assume that similar maternal influences might also cause a similar fœtal death-rate among the wives of smokers.

If then I assume that the wives of Class 2 were responsible for the deaths of 604 fœtuses, and no more, I must assume that the fathers were responsible for the balance or excess, viz., 694. This calculation may appear to be speculative, but it is not really so. The father must protect the wife as far as he can from all anxiety and privation, and he must provide good food and an abundance of pure air; he must protect her from exposure to sewer gas, from all poisonous vapours, and especially from an atmosphere of tobacco smoke; he should also abstain from smoking, lest the emanations from his body should poison the air of the bedroom, or lest his perspiration should be absorbed by his wife. When it can be proved that the father was in perfect health, and that his blood was free from any trace of organic or inorganic poison at the time of impregnation, then it follows that any disease conveyed to the fœtus must have been transmitted through maternal blood.

If the mother becomes ill after impregnation, from infectious disease such as measles, scarlet fever, enteric fever, etc., the disease is transmitted to the ovum, and it is aborted. The growth of the ovum from the time of impregnation to its separation from the womb is entirely dependent on the mother. If the mother has not sufficient oxygen in her blood for the requirement of the fœtus, it will be asphyxiated. If convulsive movements occur in the fœtus from this cause, they might set up reflex uterine action, and bring on premature labour. Nature might be able to save the child's life if labour were rapid. The need for oxygen must be ever increasing with the growth of the fœtus; and if the fœtus should absorb nicotine with the oxygen, and this should accumulate in its blood, chronic poisoning of the fœtus would take place.

How are we to account for the great difference in the fœtal mortality of the two classes? Are we to assume that the wives of Class 2 were more exposed to illness, privation, and accident than those of Class 1? Certainly not!

In all fairness, the mothers of Class 2 can only be credited with the same number of losses as the wives in Class 1, because they were subject to the same risks, and were on a par with them in all respects but one—the women in Class 2 were the wives of smokers, and therefore I state my conviction, that the tobacco poison must be credited with the number of fœtal deaths in Class 2, beyond those in Class 1.

I need not pause now to enquire as to the channels by which the poison can be conveyed, it may be by initial intoxication of ovum, through fertilisation by means of poisonous semen, or it may be by intoxication of embryo by tobacco conveyed in the maternal blood.

My theory with regard to the danger of pregnant women being poisoned with tobacco may be scoffed at, but we are here dealing with facts; and there is no denying this fact, that the wives of the smokers had twice as many dead fœtuses as the wives of the non-smokers.

It would be useless to speculate whether the ova we are discussing were poisoned by the spermatozoa, or at a later stage of development by the presence of nicotine in the mother's blood; the fact has been proved that the wives

of the smokers suffered from an aggregate of 1,298 abortions and still-born infants, while the wives of non-smokers only had 604. The excess to the smokers was 694. This is an enormous number, and I can find no explanation, unless I attribute it to the cause I have stated, viz., the indulgence of the fathers in the smoking of tobacco.

Table 8 shows the excess of abortions over still-births in both Classes per 1,000 wives :

Class 1.	
Abortions	394
Still-births	210
Excess	184
Class 2.	
Abortions	1,035
Still-births	263
Excess	772

Table 9 shows the per-centage of abortions and still-birth in both classes for every 100 live-births.

Class 1.	
Abortions	5·3
Still-births	2·8
Excess, per cent.	2·5
Class 2.	
Abortions	15·0
Still-births	3·8
Excess, per cent.	11·2

The object of preparing this Table is to show the excess of abortions in Class 2 above the still-births in the same Class. What is the cause of the abortions in Class 2 being nearly three times more than those in Class 1? I consider that more than half of the abortions in Class 2 occurred in the first three months of pregnancy and were due to a diseased condition of the ovum or its coverings, caused by the poison of nicotine and want of oxygen.

These tables will furnish an indication of the relative strength and resisting power to disease, inherent in the children of the two classes. These tables show the number of children who died in the first four years of life.

I have prepared the following tables for the purposes of comparison:

Table X.

There were 280 live-born children in the families of the non-smokers; the deaths as follows:	23 M. 20 F.
Total	43
This gives a mortality rate in 1,000 children...	82 M. 71 F.
Total	153
The deaths among the 391 children of the smokers were...	49 M. 40 F.
Total	89
Rate for 1,000 children	125 M. 102 F.
Total	227

We must now compare the male mortality among the two Classes:

Smokers...	125 M.
Non-smokers	82 M.
Excess in smokers	43

We now compare the female mortality in the two Classes:

Smokers...	102 F.
Non-smokers	71 F.
Excess in smokers	31

These Tables show a higher mortality among the children of the smokers in both sexes. It will be observed that the mortality is higher among males than females in Class 1. The ratio may be represented thus:

Smokers...	1,225 M. to 1,000 F.
Non-smokers	1,150 M. to 1,000 F.

Table showing the aggregate mortality of the two Classes:

Smokers	227
Non-smokers	153
Excess among smokers	74

These Tables cannot be compared with those of "Infantile Mortality," which only include the first twelve months of life.

Abnormal Confinements.

The histories show that the wives of the smokers had more difficulties and complications from faulty presentation than the wives of non-smokers. The development of the human ovum is the most delicate and wonderful of all the works of nature, and it is in this function where the evil results of the tobacco habit are most in evidence. The faintest trace of syphilitic poison in the seed of the male is enough to cause the early death of the ovum. The poison of nicotine is so intense that a faint trace of it in the semen is enough to cause the death of the ovum at an early period, but if the fœtus survives and is ready to be born, it undergoes special risks at birth. Physiologists have performed experiments on animals, and they have proved that nicotine, when applied to ends of nerves connected with uterus, causes the uterus to contract violently and remain in a state of spasm for a long period. I believe that nicotine in the blood of a woman in the time of her confinement may cause irregular contraction of the os, or what is known as hour glass contraction, which causes great difficulty, and often requires the use of instruments and of chloroform to relax the spasm. I have prepared an abstract to show the number of abnormal or difficult confinements in every 1,000 confinements.

In Class 2 there were	132·2
In Class 1	83·7
Excess in Class 2	48·5

Table XI.

Abscess of the Breast.

I will now compare the cases of abscess of the breast in the two classes.

There were only three cases among the wives of 38 non-smokers; there were 15 among the wives of 57 smokers. The former class is equal to a rate of 80 per 1,000 wives, and the latter is equal to a rate of 263 per 1,000 wives.

Class 2.	Smokers	263 per 1,000 wives.
Class 1.	Non-smokers	80 ,, ,,
		183 excess among wives of smokers.

These abscesses were a serious hindrance to lactation; about 5 per cent. occurred during pregnancy, while 95 per cent. occurred during lactation. The Table shows that the wives of non-smokers are liable to abscess at the rate of 80 in 1,000 women who are suckling. The causes are various, such as infection from an abrasion of the nipple, constitutional illness, injury or exposure to cold; women freely run out of doors partly uncovered and get a chill that leads to abscess. If these natural causes account for 80 per 1,000 in Class 1, how do we account for Class 2 having a rate of 263 per 1,000 wives?

It appears reasonable to assume that the wives in both Classes ran equal risks in all respects from the causes I have mentioned, but the wives in Class 2 ran the risk of inhaling the poison of tobacco in the atmosphere, and the risk of absorbing it by the use of dirty towels or by washing their husband's dirty linen, etc. The causes of abscess in the two Classes may be tabulated thus:

Table XII.

Abscess.

Class 1.

Natural causes	80
Tobacco toxin in maternal blood	0
Total	80

CLASS 2.

Natural causes	80
Tobacco toxin in maternal blood	184
Total	264

It is well-known that a man who suffers from constitutional syphilis, usually transmits the disease to the embryo, the poison being conveyed in the spermatozoa. Diseased ova are frequently aborted. Those which grow to maturity show signs of disease at birth. It is also known that men whose blood is poisoned, either by alcohol or lead, transmit a taint or defect to each embryo; these poisons may lead to the death of the embryo, causing abortion. If the embryo survive and is born alive, it will be feeble and perhaps diseased. I have carefully excluded all poisonous agents in these cases except tobacco, and therefore it is my duty to declare that I honestly believe my histories prove a serious amount of disease affecting the generative functions of the married people in the class of smokers from poison in the seed of the males.

I will try to illustrate my line of reasoning by a parable from Nature.

If a farmer has two kinds of wheat, and sows them separately in the same kind of soil and on the same day, he will expect both crops to be equally good, if he believes both kinds of seed are equally good, but if one crop is good and the other bad, he will be certain that the bad crop was the product of bad seed. He cannot attribute the defect to bad soil or bad weather, because he has evidence in the good crop that the soil and weather were favourable, therefore he can trace the cause of the failure to the bad quality of the seed.

I have followed this line of argument in tracing the causes of the excess of defects in Class 2 when compared with Class 1, and have traced the source of the evil to the tobacco poison in the seed of the fathers.

MORTALITY.

If we assume that the children of smokers and non-smokers have equal vitality at birth, we should expect them to have an equal death-rate in the first four years of existence, but we find a marked difference; the mortality rate in 1,000 children of non-smokers was 153, and that

of smokers was 227. These facts prove that the latter were born with less vitality than the former.

Summary.

	Class 1. Non-smokers.	Class 2. Smokers.
Birth rate per 1,000	7,368	6,859
Excess of Males	474	——
,, Females	——	473
Miscarriages	394	1,035
Still-born Infants	210	263
Abnormal Confinements	83·7	132·2
Abscess of Breast	80	263
Mortality amongst 1,000 living children	153	227

Final Remarks.

In the seventh section of Table X., dealing with the mortality rates of the live-born infants, I have shown that the death-rate among the male children of non-smokers was higher than that of female children of the same Class. This proves a less amount of vitality among sons than daughters; this is not limited to the two Classes I am dealing with, it is characteristic of the whole population, with, perhaps, a few exceptions. I regret to note this weakness among the sons of non-smokers. I cannot believe that the Creator originally created males of inferior physique to females. Then this weakness has been acquired by our male ancestors' habits, and I presume that the forefathers of the Class of non-smokers had indulged in tobacco, and so transmitted the defect among the male line more strongly than along the female line. All the Abstracts of smokers clearly prove that males suffer to a greater extent than females.

The record and defects in Class 2 shows clearly that there is some poison at work that is not present in Class 1. I invite inquiry and discussion, for I do not consider myself infallible, but these records will, I hope, stimulate other practitioners to take family histories on similar lines, and publish their results. Science is ever seeking for truth in all that concerns the comfort and health of the human race. It is an axiom that "health is the first wealth," and I sadly fear that in the hurry of modern times, health

is rarely considered worthy of attention, until its loss calls attention to its value. These histories afford painful reading, and show that the male sex is decreasing more rapidly than the opposite sex. The figures in Table IV. show that 1,000 wives of smokers may expect a loss of 728 males and an excess of 219 females, compared with 1,000 wives of non-smokers. What does this represent among the whole population of smokers? It has resulted in a serious inequality of the sexes, and a steady decline in the birth rate.

CHAPTER XIII.

Histories of the Families of ten Men who were Abusers of Alcohol and Tobacco, with Details as before, and Abstract.

Class 3.

It is unsatisfactory to investigate cases in which the husbands have indulged in both alcohol and tobacco, unless accurate information can be supplied as to the exact amount of tobacco and alcohol consumed by each. I regret I have not a larger series of Cases of this Class, and I offer these as a small contribution to an important subject, hoping I shall induce others to pursue the subject. It is an interesting question to ascertain whether chewing of tobacco is quite so harmful as smoking. The chewer does not produce carbon monoxide gas, and therefore he escapes one deadly product which assails the smoker. Case 10 is that of a man who chewed for many years and never smoked.

Case 1.—This is the family of a man who was only a moderate smoker, and indulged in alcohol to excess occasionally.

1. Boy, healthy, died of fever abroad.
2. Boy, living.
3. Boy.
4. Girl, living.
5. Boy, ,,
6. Boy, ,,

After an interval of nine years she bore :

7. Girl.

Total, five boys grew up, and two girls; the children enjoy average health. One miscarriage, one abscess of breast; the wife is robust.

Case 2.—An abuser of alcohol and tobacco to the age of 42, is now 55. He served in the Navy. At the age of 37 he married; his wife was then 30. He then earned his living as a painter; he indulged freely in cigars, pipes, and whiskies; he used nearly an ounce of tobacco a day. At the age of 42 he gave up alcohol and tobacco, and began a Christian life; his wife is an active, healthy woman, she bore:

1. Girl, now 17 years old.
2. Boy, „ 16 „
3. Boy, „ 14 „
4. Girl, „ 12 „
5. Boy, „ 10 „

One miscarriage.

6. Girl, now 8 years old.

And then another miscarriage.

Total, three boys and three girls, all healthy.

In less than ten years she had six children and two miscarries. She ceased bearing at 40.

Case 3.—D. is a sailor, age 70. His father drank and smoked to excess, and died between 40 and 50; his mother died at 77. D. began to smoke at 14; he spent many years at sea; he smoked both day and night; he drank spirits and beer. At the age of 20 he married a fine woman of his own age, she bore one son and one daughter, both died young. He used to smoke four ounces a week, and was often drunk. Twelve years ago his wife persuaded him to give up his drinking and smoking. At the change of life the wife had frequent severe hæmorrhage from the uterus, and was laid up for many weeks. It subsided, and she recovered her health. They are both over 70, and live happily together.

Case 4. The husband was a painter, he smoked much, and drank on and off. I think he suffered chiefly from chronic tobacco poisoning, he died of cancer of the tongue at the age of 48. The wife was one of a large family; her mother is still living, over 80, her father lived to 83.

She was married at 20, all her confinements have been abnormal.

1. Girl, placenta was adherent.
2. Boy, born two years later; her menses continued during first five months of pregnancy.
3. Boy.
4. Girl; mother was removed to hospital with fever five days after confinement.
5. Girl, born two years after last, died in convulsions in 16th month.
6. Boy, born seventeen months after last; mother had severe hæmorrhage and nearly died, the menses did not return for two years.
7. Boy, born four years after last, severe flooding occurred on third day, she was admitted to hospital.
8. Girl; after her birth the menses recurred every two weeks for two years.
9. Girl, has suffered from a weak heart since birth, she is a bright child of 7.

During one pregnancy the right breast became inflamed, and was bad for several months. It did not suppurate. All her children were breast-fed except one. It is greatly to the mother's credit that she never miscarried, and that she only lost one child; none of them were strong. Hard work, with poverty and illness, have worn out her health, and she is now an incurable invalid at 48.

Case 5.—Husband was a painter, quarrelsome when under the influence of drink; wife was the daughter of the man in Case 38, Chapter 10; her pregnancies were fifteen altogether.

1. Boy, dead-born at full time.
2. Boy ,, ,,
3. Girl, foot presentation, died of injury at birth.
4. Girl, died soon after birth.

Subsequently she bore seven sons and four daughters who are now living. I believe the wife has been a sober and industrious women and done her best for her children, therefore I consider that probably her first four pregnancies failed to run a normal course and ended in four dead infants,

owing to violent conduct on the part of the husband, just at the time when she needed rest and kind treatment. It is wonderful that in her last eleven pregnancies she succeeded in going to the full time and bearing eleven living children. Had she become accustomed to his violence or had he become more humane?

Case 6.—Mrs. D. is an active, intelligent woman of 60; she is healthy; she gave me the following history: her father was not a smoker; he died at the age of 49; her mother lived to 83; she had three brothers, non-smokers; she was married at the age of 18; her husband was the same age; he was a cooper by trade and was engaged for many years in a wine and spirit stores; his usual drink was whiskey, and he took more than was prudent; he was not a smoker when first married, but commenced it under the advice of a medical man; he was once laid up with congestion of the lungs many months; he is now feeble and beyond work, though not over 60. The wife is an abstainer from alcohol; she has borne the following children:

1. Girl, now living.

After some time followed a miscarriage at the third month.

2. Boy, still-born at seventh month.
3. Girl, ,, ,, ,,
4. Girl, ,, ,, ,,
5. Girl, ,, ,, ,,
6. Girl, ,, ,, ,,
7. Girl, ,, ,, ,,
8. Girl, ,, ,, ,,
9. Boy, grew up strong, and married; he smoked cigarettes to excess, and died of phthisis at 36 years of age.
10. Girl, only lived 6 months.
11. Boy, now 31, an abstainer from alcohol and tobacco.
12. Boy, now 29, ,, ,, ,,
13. Girl, now 24.
14. Girl, now 22, married and healthy, with two children.

The mother never had an abscess of the breast.

She ceased to bear children at the age of 38. In the course of twenty years she conceived fifteen times as follows :

Three boys, born healthy.
One boy, still-born.
Four girls, born healthy.
Six girls, still-born at seventh month.
One miscarriage at third month.

The mother came of a healthy stock, and proved it by her recovery from so many abnormal pregnancies, and by her present good health. The birth of seven still-born children in succession is extraordinary.

Case 7.—Mrs. O. is the daughter of the lady described in Case 6, Chapter 10 ; she married a labourer at the age of 22 ; he indulged freely in alcohol and tobacco ; his wife has borne two sons and two girls, all breast-fed and all living ; she had no miscarriage, but has often suffered from prostration and headache from domestic causes ; she has worked in a laundry many years ; she is now 50. This is a small family for a couple wedded so many years and may be called comparative sterility.

Case 8.—A painter ; parents healthy ; was married at 22 ; wife was 21 ; he is wanting in energy and in interest in his home and family ; he smokes constantly and drinks when he can afford it ; his wife has to maintain the home ; she has borne :

1. Boy,
2. Girl,
3. Girl,
4. Girl,

} all easy confinements ; all children living.

One miscarriage at second month, recently. The wife is sober and active, but anæmic, 31 ; her mother had seventeen children.

Case 9.—A widow, age 71, gave me the following history :—She entered domestic service at the age of 8 ; her husband used to smoke half-an-ounce of tobacco a day ; she bore the following :

1. Boy, now living.
2. Boy, ,,
3. Boy, died at 46.
4. Girl, living.
5. Girl, afflicted with a severe form of rickets; head, body, and limbs much deformed.
6. Girl, died at third month.
7. Girl, ,, ,,
8. Boy, ,, ,,
9. Girl, died suddenly of heart complaint at 21.
10. Girl, now living.
11. Boy, ,,
12. Girl, died at third month.

She had lingering confinements; no miscarriage; no abscess. Husband was an invalid for twenty years before death; he gradually became blind and lost his memory; his hands were tremulous. This history suggests tobacco poisoning and amaurosis.

Case 10. R. was healthy before he began drinking and chewing tobacco. After marriage he enlisted in the Royal Marines; his wife was a healthy woman, age 20; she has borne ten sons and two daughters by him, and one miscarriage. Three sons and one daughter died young; seven sons entered the Army. She had very tedious confinements; while she was suckling her children, the auxiliary glands became inflamed and formed abscesses; the breasts were not inflamed. The husband was often the worse for drink; he never smoked tobacco, but he has been in the habit of chewing one and a half ounces per week; he is nearly without teeth at the age of 65; he gives way to drink occasionally; he is weak, mentally.

ABSTRACT III.

Abstract of Cases among Abusers of Alcohol and Tobacco. Class 3.

Case	Born living — M.	Born living — F.	Died under 5 years — M.	Died under 5 years — F.	Still born — M.	Still born — F.	Miscarriages	Abscess of Breast	Twins none Conceptions
1	5	2	—	—	—	—	1	1	8
2	3	3	—	—	—	—	2	—	8
3	1	1	1	1	—	—	—	—	2
4	3	6	—	1	—	—	—	—	9
5	7	6	—	2	2	—	—	—	15
6	3	4	—	1	1	6	1	—	15
7	2	2	—	—	—	—	—	—	4
8	1	3	—	—	—	—	1	—	5
9	5	7	1	3	—	—	—	—	12
10	10	2	3	1	—	—	1	—	13
Tot.	40	36	5	9	3	6	6	1	91
	76								

Tables of Comparison.

10 wives had an aggregate of 76 children, equal to rate of 7,600 to 1,000 wives, being an average of 7·6 to each family, ratio of sexes being 1,111 M. to 1,000 F. This is inferior to Class 1, with 1,137 M. to 1,000 F., but is vastly superior to Class 2, with 871 M. and 1,000 F.

The mortality was 14 in 76 live-born, equal to a rate of 184 to 1,000 living children. Compare this with Class 1 with 153, and Class 2 with 227 to 1,000 children.

There were 9 still-born children to 10 wives, equal to a rate of 900 to 1,000 wives (or 118 to 1,000 live-born). This compares badly with Class 1 with 210, and Class 2 with 263 still-born to 1,000 wives.

Abortions: there were 6, equal to 600 in 1,000 wives (or 79 to 1,000 live-born). Compare this with Class 1, 394, and Class 2, 1,035 abortions to 1,000 wives.

The worst feature in this Class is the large number of still-born infants, being three times more than in Class 2, one woman having seven in succession at the seventh month. These latter may have been cases of premature birth, partly due to asphyxia of the fœtus, and partly to nervous influences acting on the mother and promoting general irritability of the nervous system.

The number of abortions is slightly above Class 1, but not nearly so bad as Class 2. While the number of conceptions is higher than in either Class, thus:

TABLE XIII.

TOTAL NUMBER OF CONCEPTIONS TO 1,000 WIVES.

	Class 1.	Class 2.	Class 3.
Loss of fœtal lives ...	604	1,298	1,500
Live-born children ...	7,368	6,859	7,600
	7,972	8,157	9,100

Class 3 had the largest number of conceptions, the largest number of fœtal losses, and the largest number of living children. The chief point of interest in this Class is that the male infants are in good proportion to the females, though not to the same degree of excess as in Class 1. It is possible that the alcohol used by these men helped to eliminate the nicotine and other products from their bodies, and was an antidote. Anyhow they showed no sterility, and had a normal excess of male infants.

I must caution the reader that statistics based on such a small number of Cases will not serve as a safe basis for studying the relation of cause and effect in such a complicated matter as herein is discussed.

CHAPTER XIV.

Brief Records of the Families of twenty-seven Non-Smokers among acquaintances, friends and patients, not included in the other Histories; with Tabular Abstract.

"In the multitude of people is the King's honour; but in the want of people is the destruction of the prince."—*Prov.* xiv. 28.

Class 4. Non-Smokers.

In attempting to collect further records of children born to non-smokers and smokers for the purposes of comparison, I frankly confess that I have chosen the best of the former, and the worst of the latter, consequently the contrast between the two series is great.

The cases of non-smokers, which I have collected and arranged in this Chapter, belong chiefly to the past generation. I had no opportunity of getting information as to abortions or still-births, or other details.

I have been able to trace the histories of some families through three generations; and thus I have proved that the healthiest young people are those who have non-smoking ancestors; they have good eyesight, well-shaped jaws, well-balanced minds, and are well developed.

Case 3.—William B. was born of industrious and healthy parents; he grew up an honest man of great ability and established a large business; he had great energy of mind and body and was of a strong constitution; he never smoked; he amassed a fortune and was truly liberal; he was three times Mayor of Chester; he had

four sons and one daughter, all healthy and intellectual; he was able to attend to his duties on the Bench and to business at the age of 83. A brother, who was not a smoker, lived to 82 and died a bachelor. (See Case 3, Abstract IV. at end of Chapter).

Case 7.—The Rev. Jeremiah Scholefield, born in 1764, obtained a fellowship at Trinity College, Oxford, which he resigned to get married; he then became the Rector of Barton-on-the-Heath, which he retained till his death at the age of 85; he always enjoyed good health and fulfilled his parochial duties up to his last illness; he had good teeth and a fresh colour in his old age; his wife bore four sons and five daughters, who inherited their father's fine mental, moral, and physical qualities; he was never a smoker. Four daughters died at the following ages: 75, 50, 72 and 92, while the youngest daughter is now in good health and spirits and possesses a keen intellect, a good memory, good sight, and a good appetite; she is now in her 90th year; her father was 70 years old at the time of her birth.

Case 8.—Son of the latter; became a clergyman; a non-smoker; he enjoyed excellent health until he got blood poisoning, which ended fatally; he died at 68; he married a delicate lady who bore eighteen living children, eight sons and ten daughters, including three sets of twins. There were also five miscarriages and one still-born child, making a total of twenty-four pregnancies. Fourteen grew up strong and intelligent; all the sons did well. They were a happy family, though not rich; the widow is still living and has all her faculties.

Case 9.—Another son of Case 7; was Captain in the Royal Navy and was a non-smoker; his wife bore four sons and four daughters.

Case 10.—Was Vicar of a country parish, was no smoker, and used alcohol sparingly. He and his wife were healthy; she bore four sons, including twins, and one daughter. He retained all his faculties, and took Sunday duty up to the age of 90, when he died of acute bronchitis. His wife lived to 86.

Case 11.—The eldest son of the latter became a clergyman, he was no smoker. His wife bore five sons, no daughters.

Case 12.—A twin son of Case 10, became an officer in the Royal Engineers, he is a non-smoker and almost teetotal; his wife bore seven sons and one daughter. One son died, and four entered the Army.

Cases 10, 11 and 12 had an aggregate of sixteen sons and two daughters. Such a ratio, eight to one, is an unusually high record.

Case 13.—A boy of a good Scotch family, one of a family of thirteen, born 1786. He entered the Navy at the age of 14; was first stationed in the West Indies, and next in China; afterwards he was engaged in active service for many years, and was promoted for gallantry. He was twice married but had no child; he never smoked and was strictly temperate in all things; he enjoyed good health to the age of 90, when he died of senile decay. One of his ancestors, who was twice married, had twenty children by his first wife, and nineteen by the second wife; they were jocularly spoken of as "The Thirty-nine Articles"; tradition says the father was not a smoker.

Case 14.—A gentleman, aged 86; he has never smoked; he has good eyesight. He and his wife are both healthy, and enjoy a long walk together when the weather permits; they have one son and one daughter.

Case 15.—The history of a business man who owned a paper mill in Yorkshire; he possessed good health and spirits up to the age of 80, and worked hard in his public and private duties up to that age. He was no smoker, and almost teetotal for many years; he was born in 1819, and married in 1847. His wife was five years younger; they had nine children, as follows:

1. Son, still-born, born July, 1848.
2. Daughter, born January, 1850.
3. Son, born September, 1851.
4. Daughter, born February, 1854, died 1868.
5. Son, born August, 1855, died aged 8 days.
6. Daughter, born June, 1859.
7. Daughter, born March, 1861.
8. Son, born May, 1863; he became a smoker. He died of heart disease, aged 39. He was strictly temperate.
9. Son, born May, 1866.

The mother died, age 60, she was an invalid, more or less, since the birth of her last child. The father died of cerebral hæmorrhage at the age of 82.

Case 16.—F. was the second son of a merchant and freeman of the city of London. He succeeded his father in the business; was born in 1812; he never smoked tobacco, and was often heard to state that neither his father nor his grandfather smoked. He was a moderate drinker; he married at 28; his wife was then 24; she bore two sons and one daughter. F. re-married, and by his second wife had five boys and three girls: total children seven sons and four daughters. F.'s eldest son, a non-smoker, served in the Army and is now living, age 70; an active and healthy man, with good sight and no trace of baldness.

Case 17.—The record of a working-man now living in Manchester, who is a life-long abstainer from alcohol and tobacco. One of his sons gained a scholarship at Owen's College, and afterwards received a medical training at Edinburgh University, where he gained the degrees of M.B. and Ch.B. He is now stationed in India, and is occupied in Medical Mission work.

Case 25.—A gardener, born in 1835; has never been a smoker; never had a serious illness. He is now 76 years of age; he has good eyesight; he is strong and active; a good workman, and is above the average in intellect.

Case 26.—A cab driver in Torquay for many years; a life-long abstainer from alcohol and tobacco. At the age of 57 he was in good health; height 5ft. 10in., weight 10 stone 4 lbs.; his wife was healthy; they had four sons and no daughters. His sons took advantage of their opportunities for education and did well after leaving school. The shortest of them was 5ft. 9in., the tallest 6ft. 3in.

ABSTRACT IV.

NON-SMOKERS. CLASS 4. PROFESSIONAL MEN, ETC., AND WORKING-MEN.

Case.		Children. M.	Children. F.
1	Solicitor	5	4
2	Barrister	5	3
3	Business man see history	4	1
4	,, ,, married over thirty years	—	—
5	Head Master, Public School	5	2
6	A famous Surgeon	4	2
7	Clergyman see history	4	5
8	,, ,, ,,	8	10
9	Captain, Royal Navy ,, ,,	4	4
10	Clergyman ,, ,,	4	1
11	,, ,, ,,	5	—
12	Colonel, Royal Engineers ,, ,,	7	1
13	Admiral, Royal Navy ,, ,,	—	—
14	Gentleman ,, ,,	1	1
15	Millowner ,, ,,	5	4
16	Merchant. Two wives ,, ,,	7	4
17	Working-Man ,, ,,	7	2
18	,, ,,	8	6
19	,, ,, lived to 70	4	8
20	,, ,, ,, 83	2	3
21	,, ,, ,, 60	6	1
22	,, ,, ,, 77	3	4
23	,, ,, ,, 80	6	3
24	,, ,, ,, 72	8	2
25	Gardener see history	4	3
26	Cab-driver ,, ,,	4	—
27	Carpenter ,, ,,	3	—
	Total	123	74
		197	

ANALYSIS OF ABSTRACT IV.

The wives of twenty-seven non-smokers bore 197 children, consisting of 123 males and 74 females.

This would represent a fertility rate for 1,000 wives of 7,296 children in the proportion of 4,556 M. 2,740 F.

Excess of males 1,816

The ratio of the sexes at birth is 1,662 M. to 1,000 F. This is much higher than in Class 1. The ratio of males to females may be regarded as ideal or superlative. When both the male and female rates are normal, then the difference becomes an actual excess, and not a relative excess. If the whole population of England and Wales could produce male and female infants at these rates, the balance of the sexes might be speedily restored, and the happiness and prosperity of home life also be restored.

CHAPTER XV.

Abstract of the Families of Fifty-one Smokers among acquaintances and patients of all classes; with Histories of selected Cases; Analytical Tables of Comparison, and explanations.

ABSTRACT V.

Smokers. Class 5. Professional and Business Men.

Case.		Children. M.	F.
1	Gentleman	3	1
2	Captain in Merchant Service	—	3
3	Medical man, married many years	—	—
4	Medical man, heavy smoker, moderate in alcohol; first wife died of cancer, second wife is childless	—	3
5	Medical man, married twenty years	—	—
6	Medical man, ,, ,, ,,	—	—
7	*Clergyman, smoked cigars and drank spirits; he lost health and retired about the age of 70	1	5
8	*Clergyman, heavy smoker; one married daughter bore twins in her first three confinements	—	9
9	*Clergyman, married twenty years	1	3
10	Solicitor, ,, ,, ,,	—	—
11	Medical man, ,, ,, ,,	—	—
12	*Clergyman, married ten years	—	—
	Carried on	5	24

ABSTRACT V.—CONTINUED.

SMOKERS. CLASS 5. PROFESSIONAL AND BUSINESS MEN.

Case		Children	
		M.	F.
	Brought up	5	24
13	Country Squire, who rarely took alcohol but smoked much; he died of general paralysis	2	1
14	Medical man, married over ten years	—	—
15	Business man, ,, ,, thirty years	—	—
16	Medical man, died of phthisis at 45	—	4
17	Medical man, indulged freely in alcohol and tobacco; died suddenly	2	1
18	*Clergyman, began to smoke in his school days and injured his health permanently	1	2
19	Business man, who smoked to excess and suffered from asthma for twenty-one years	1	1
20	*Clergyman, twice married, he became hypochondriacal and died at 60	—	—
21	Gentleman, married over twenty years	—	—
22	Gentleman, ,, twenty ,,	—	—
23	*Clergyman, ,, ten ,,	2	2
24	*Clergyman, ,, ten ,,	—	—
25	*Clergyman, ,, ten ,,	—	—
26	Baronet, ,, ten ,,	1	2
27	*Clergyman, ,, ten ,,	—	—
28	*Clergyman, ,, ten ,,	—	—
29	*Clergyman, ,, ten ,,	—	—
30	*Clergyman, died at 76; first wife died of cancer of breast, second wife was sterile	—	1
31	Medical man, married over ten years	—	2
32	Thatcher, wife bore three sons and three daughters in single births, and finally was confined of triplets (three girls) who all grew up	3	6
33	Working-man, lived to 70	5	4
34	Tailor, drank and smoked to excess, he became insane, and died in an asylum; wife died of cancer	3	1
35	Farmer	3	—
36	Working-man, lived to 82	3	9
37	Working-man	2	6
38	Seaman, began to smoke at 30	8	2
	Carried on	41	68

*Church of England.

ABSTRACT V.—CONTINUED.

SMOKERS. CLASS 5. PROFESSIONAL AND BUSINESS MEN.

Case		Children M.	Children F.
	Brought up	41	68
39	Farmer	3	11
40	Printer, drank to excess, died of phthisis; wife died of cancer of womb	—	—
41	Working-man	8	2
42	Man, worked in a brewery, smoked cigars, died of phthisis	—	1
43	Gardener, abstainer from alcohol	3	5
44	Working-man	2	8
45	Working-man, addicted to alcohol	—	—
46	Working-man, died suddenly of heart failure	3	2
47	Working-man, intemperate; one son became a heavy smoker and died of cancer of the tongue	4	6
48	Working-man	—	—
49	Tailor, now living, 85, was a beer drinker; is afflicted with gouty chronic arthritis; has been twice married	—	—
50	Working-man, drinker, died of phthisis at 46; one son who drank and smoked, died of the same disease at 26	3	6
51	Tradesman, lost his business through drink	3	4
	Total	70	113
		183	

ANALYSIS OF ABSTRACT V.

CLASS 5, SMOKERS, COMPARED WITH CLASS 4, NON-SMOKERS.

The fertility rate is represented by the number of live-born infants to 1,000 wives. The wives of 51 smokers bore 183 infants, 70 M., 113 F. Excess of F. 43. Fertility rate for 1,000 wives in this Class is 3,588 infants, in the proportion ... ... 1,372 M.
2,216 F.

Total 3,588

This rate must be compared with that of Class 4 :

Table I.	Class 4	7,296
	Class 5	3,588
		3,708

This Table proves that the fertility rate for 1,000 wives in Class 5 is 3,708 infants less than Class 4. These two Tables reveal two serious defects, viz., a relative loss of children, with a relative excess of females.

The correct method of ascertaining the defects in any series of cases, is to procure a series of healthy cases as a standard of comparison. The true birth-rate of a country must be a rate of birth to the total number of married women or women of conceptive ages. These histories supply true birth-rates, because they give the rates of children to 1,000 wives, based on the number of children born, to a definite number of wives in each class.

In order to estimate the fertility of a birth-rate, it is necessary to compare the male and female fertility rates respectively, with those of a healthy standard. There are three essential points in a birth-rate for consideration :

1. The general fertility rate, consisting of the aggregate male and female infants.
2. The male fertility rate.
3. The female fertility rate.

This method of examination will reveal the defects clearly.

I will take Class 4 as the base for my comparison, as it represents a normal fertility rate, with a normal ratio of the sexes. It would be more accurate to describe Class 4 as a superlative Class, because the ratio of males to females is superlatively high.

The male fertility rates are as follow :

Table II.	Class 4...	4,556 M.
	Class 5...	1,372 F.
		3,184

This Table demonstrates that the male fertility rate in Class 5 is 3,184 less than that of Class 4. This may be described as a loss of 3,184 males to 1,000 families.

The female fertility rates are as follow :

Table III.	Class 4	2,740 F.
	Class 5	2,216 F.
		524

This Table demonstrates that the female fertility rate in Class 5 is 524 infants less than that of Class 4. These two Tables show that the loss or deficiency of males is six times greater than that of females, as will be seen when the losses are compared thus :

Table IV....	M. loss	3,184
	F. ,,	524 × 6 = 3,144

The total loss of births to 1,000 wives in Class 5 is :

	3,184 M.
	524 F.
Total	3,708

Some authors would describe this loss as a measure of "comparative sterility," but I think it more correct to describe it as a low rate of fertility ; the term "sterility" can then be reserved to describe the complete absence of children. This analysis reveals three fundamental defects :

1. An aggregate loss of 3,708 infants to 1,000 wives.
2. An actual loss of 3,184 males.
3. An actual loss of 524 females.

When the sex rates of Class 5 are compared together, we notice that there is a relative excess of females :

Table V.	2,216 F.
	1,372 M.
Excess of females	844

This so-called relative excess is associated with a deficiency of males, and leads to a serious inequality of the sexes. Fortunately, it is only present in this Class and in Class 2, both Classes being smokers. Such a marked disturbance of the normal ratio of the sexes cannot be accidental, nor is it the result of manipulation of statistics ; as this disturbance only affects the Classes of smokers, it must be assumed to be the result of this habit.

Class 5 is composed of two different classes of men, those who belong to the professions forming the first 31 Cases, and working-men forming the last 20. The latter class usually marry early in life; they live active lives, and are usually in a good state of health at the time of marriage; they usually marry for love, and have fewer anxieties and responsibities than the professional men—for these reasons they have a higher fertility rate. Marriage among men in the professional class is now often deferred to the age of 30, or even later, for want of means to support a wife. I do not attribute the low rate of fertility as a direct consequence, except in the case of men who commenced their married lives, much the worse in consequence of many years indulgence in tobacco. It is quite obvious that the older the woman is at the time of marriage, the less chance there is of many children.

Table to show fertility rates:

31 wives of professional men bore	14 M.	40 F.	Total 54
20 wives of working-men ,,	56 M.	73 F.	Total 129

Table VI. The rate for 1,000 wives:

Professional men, 1,742	... 1,290 F.
	452 M.
Excess of females	... 838
Working class, 6,450	... 3,650 F.
	2,800 M.
Excess of females	... 850

The above Table shows that the male fertility rate reaches low water mark in the professional class, being six times lower than the working class. The relative loss of males being 83 per cent., the relative loss of females being 35 per cent.

The wives of the professional class have a relative deficiency of 4,708 Infants. The great excess of females in each class, is the clearest indication that the wives of smokers cannot produce male and female infants in the natural ratio, because they cannot produce males in excess of females. The histories of the non-smokers always show an excess of males.

The serious deficiency of males in both classes is clearly proved by the following figures:

Ratio of males to females at birth

Professional Class	350 M. to 1,000 F.
Working Class	767 M. to 1,000 F.
The mean of the two Classes is ...	610 M. to 1,000 F.

A deficiency of male births is thus clearly proved to be a common defect among the wives of smokers.

CHAPTER XVI.

Ratio of Sexes at birth. A method for estimating the annual number of Cases of Abortion (including Still-born Infants) which may be traced to the Abuse of Tobacco by the Husbands; also the number of Cases of Abortion from various causes, independent of Tobacco.

I wish to call particular attention to one peculiarity in the female fertility rate in Class 2. It is abnormally high; it is not only 473 higher than the male birth-rate of the same Class, thus causing a relative excess of 474 female infants; but when compared with the female birth-rate of Class 1, it shows an actual excess of 219 female infants. This is a strange fact, and suggests the thought that this over-fecundity in female infants is the result of the low fecundity in male infants.

It seems as if Nature, baulked in one direction, showed her reproductive power in another direction, with the result of a large excess of female infants above the normal. It is evidence of a high degree of reproductive power in the wives of this Class, which was not present in the wives of Class 5. It illustrates the far-reaching effects of tampering with the laws of the Creator. See Tables II. and IV., Chapter XII.

I have now demonstrated a large excess of females in both classes of smokers, and I have shown that there is an excess of males in both classes of non-smokers.

The ratio of the sexes in these Classes can be plainly demonstrated:

Non-smokers, Class 1	...	...	1,137 M. to 1,000 F.
,, ,, 4	...	...	1,662 M. to 1,000 F.
Smokers, Class 2	...	...	870 M. to 1,000 F.
,, ,, 5	...	...	610 M. to 1,000 F.

Final comparison of the combined Classes of non-smokers with those of smokers in rates for 1,000 wives:

Non-smokers, Classes 1 and 4	...	7,339	children.
Smokers, Classes 2 and 5	... ...	5,314	,,
		2,025	

This Table proves that the rate of loss to 1,000 wives of smokers is 2,025 infants. We may assume that there is a similar loss in every 1,000 wives of smokers in the general population. Whether the loss is the result of absolute sterility or of abortions, matters not so far as vital statistics are concerned. It means a large loss of life which might and ought to be prevented in a civilized country.

It is an axiom in physics that there can be no effect without a cause; it is also an axiom of nature that there must be a cause for every effect. For every disease there must be a cause; for every defect there must be a cause. We may start with the simple fact recorded in the book of Genesis: "And God saw everything that He had made, and, behold, it was very good."

No intelligent person can doubt the truth of this statement. The evidence of the harmony that exists in nature is evidence of the supernatural skill and wisdom of the Unseen Creator and Architect. Day and night succeed each other year by year, the daylight varying in length according to the season of the year. There are some men who are so narrow-minded as to think that modern men have discovered science, and that it supplies all our needs. Science is but the revelation of the laws by which God controls all living creatures. The object of legitimate science is to help man to live in harmony with the laws of the Creator. There is always a danger of exceeding our duties in our search for knowledge, and we must never break any of God's laws in our search for knowledge. God has revealed to men of this generation many of His laws, which we call science, which were unknown to the men of the last generation. Some people of the present day seem

to forget that science is closely related to religion, and comes from inspiration. The great men of science have usually been religious men, though some have become so absorbed in study as to forget the Unseen Author of all life and science.

God has revealed many of the hidden causes of disease to the servants of Christ, and the medical art now flourishes in the foremost countries that profess Christianity. These histories reveal the awful consequences of what follows the abuse of tobacco among married men. Thank God there are some men who are fully alive to the evils of the tobacco habit. A book has recently been written by Mr. James Pyper, M.A., Principal of Belfast Mercantile College. He asks the question, "Is tobacco smoking not suicide and murder?" These pages give a true answer, and show it is *race suicide.* The first recorded commandment to the human race was, "Be fruitful, and multiply, and replenish the earth."—*Gen.* i. 28.

God is dishonoured by self-inflicted imperfections on any of His own children, and what will He do to save the people of this land from the effects of the annual consumption of ninety million pounds of tobacco? He will not perform miracles to restore health and fertility to those who have wilfully poisoned themselves by a weed grown in foreign countries. Not only do the smokers suffer, but their wives and children suffer to the third and fourth generations, and ultimately become extinct. The non-smokers show a good rate of fertility, and show no signs of degeneration. The race of smokers is slowly and certainly degenerating and approaching extinction. Many observers have noticed that the girls of the present day are stronger and taller than those of the last generation, while the men are smaller and weaker.

I admit this may be true among the children of smokers, and I regard it as a result of that habit. My histories have shown that the males in Class 2 were not only fewer in number than females in that Class, but that they had less vitality, as was proved by the higher rate of mortality. Thus the male race is being exterminated at a quicker rate than the female. It is needless to insist that the defects which have been exposed in these two Classes of smokers must also exist among the general Class of smokers according to the amount of tobacco used. These

histories prove that tobacco is responsible for a large number of abortions in Class 2. No returns are made of the number of abortions or still-births which occur in Great Britain year by year. I have therefore devised a method for estimating the probable annual loss of fœtal lives (abortions and still-births) in the general population in England and Wales.

Assuming that the proportion of fœtal losses to live-born infants in the general population is in the same ratio as in the combined Classes 1 and 2 (non-smokers and smokers), then, by taking this ratio as our standard, we can estimate the probable number of abortions and still-born infants in the whole number of births for one year. First, add the total number of live-born children in Classes 1 and 2 together, and then add together the total number of fœtal losses in these two classes, divide the former by the latter, and we ascertain that there is one fœtal loss to every seven living children. The figures on which I make my estimate are given here :

		Fœtal losses.	Live-born.
Class 1.	Non-smokers... ...	23	280
Class 2.	Smokers	74	391
		97	671

This represents a rate of one dead fœtus to seven live-born children.

The Registrar General states the total number of legitimate and illegitimate children born in 1909 to be 914,472 ; we can now estimate the probable number of fœtal losses for this number of live births by the above ratio.

Divide the total number of births in England and Wales by 7, this gives the number of abortions as 130,638. I believe this figure is below the mark, for the reason that my combined Class 1 and 2 contains a larger number of non-smokers than the general population, it must, therefore, be better and should have a lower ratio.

I find on reference to Jewett's " Practice of Obstetrics " that Hegar estimated the average to be one abortion or still-born infant in every eight or ten live-born infants ; and other authorities estimated one in every five or six ; I think the latter is nearer the mark. But surely the

general population will be better than Class 2, which consists entirely of smokers, and has a ratio of one in five; then it seems to me that one in six will represent the average rate for the whole country; that rate gives 152,412 abortions and still-births.

I will now proceed to calculate the number of fœtal losses in the general population, which may be traced to general causes (independent of tobacco), and, secondly, the number of abortions entirely caused by tobacco.

I will first assume that the whole population consists entirely of non-smokers, and that the ratio of fœtal losses to living infants is the same as in Class 1.

I will next assume that the whole population consists entirely of smokers, and that the ratio of fœtal losses to living infants is the same as in Class 2.

Then I will compare the two rates of fœtal losses, and the difference will represent the number of abortions and still-born infants caused by the abuse of tobacco.

In Class 1 there were twenty-three fœtal losses to 280 living infants; a rate of one in twelve.

In Class 2 there were seventy-four fœtal losses to 391 living infants; a rate of one in five.

If the proportion of fœtal losses to the number of live-born infants in the whole population be in the same ratio as Class 1, the fœtal losses would be 76,206 to 914,472 living infants.

But, if the proportion of fœtal losses to the number of live-born infants in the whole population be in the same ratio as Class 2, the fœtal losses would be 182,894 to 914,472 living infants.

Table to show the fœtal losses in the two Classes:

Class 2, Smokers	182,894
Class 1, Non-smokers	76,206
	106,688

This Table is an estimate based on data, provided by my histories of the Classes 1 and 2. It shows that if the whole population of England and Wales consisted of non-smokers, the fœtal losses would be 76,206 in a year; and, secondly, it shows that if the whole population consisted of smokers the fœtal losses would be 182,894 in a year.

	Ratio.	Fœtal losses.	To living births in year 1909.
Non-smokers, Class 1.	1 in 12	76,206	914,472
Smokers, Class 2.	1 in 5	182,894	,,
Non-smokers) Class 1 & 2 and Smokers) combined	1 in 7	130,638	,,
Dr. Jewett's estimate	1 in 6	152,412	,,

Is it not time that Official record should be kept of these serious losses?

We have now in theory taken a census of two Classes of people, resembling each other in all respects except that one Class abstained from tobacco, and the other Class smoked tobacco habitually. We may now safely assume the abortions in the former Class were due to a variety of causes not associated with tobacco. We may also assume that the latter Class was liable to a similar number of abortions as the former Class, due to general causes not associated with tobacco, while any balance or surplus in latter Class must be attributed entirely to the influence of tobacco. The difference between the two Classes is 106,688 abortions and still-born infants. We must therefore regard these as due entirely to the influence of tobacco.

If this large number of abortions were the only result of the abuse of tobacco, it would be a terrible proof of the evil of the habit, and ought to suffice to convince every right-minded man to regard the habit as barbarous and suicidal. If my estimate is correct, the abstinence of tobacco for a whole year through the country would produce an increase in the births, and would raise the total to over one million, thus:

Abortions	106,688
Live-births	914,472
	1,021,160

I have clearly demonstrated by the Table in Chapter XII. that the wives of smokers are more liable to abort than

the wives of non-smokers. The only explanation I can offer is that in the former there is a greater liability to congestion in the uterus and in the ovum, which leads to a separation of the fœtal from the natural structures, ending in abortion. In such a case the poison of tobacco in the ovum acts as a predisposing cause, while the actual or immediate cause may arise from any constitutional disease: from shock to the system, or from over-exertion, etc. Jewett states that "abortion occurs most frequently in the third month. It is especially liable to take place at the menstrual periods. It is very probable that this greater frequency at this period is due to the fact that at this time important changes are taking place in the attachment between the ovum and the uterine wall. It is the period of the formation of the placenta. The chorionic villi situated on the periphery of the ovum undergo atrophy, while those situated in contact with the uterine wall (the decidua serotina) become hypertrophied." This description seems to suggest that abortions are usually due to initial or original disease in the ovum rather than to disease derived from the mother.

Women usually blame themselves for abortions, because they are not aware that the abuse of tobacco on the part of the husband often leads to the early death of the ovum from atrophy of the chorionic villi, etc. Some trivial illness is then blamed for the miscarriage, and the original cause is never suspected.

Before concluding this painful inquiry I must call attention to the danger to the mother after an ordinary abortion. Local disease often originates, and, rarely, death may ensue. The average mortality in England to one million living women was stated to be:

In 1906 ...	...	...	...	...	...	8 deaths
In 1907 ...	...	...	...	...	...	6 ,,
In 1908 ...	...	...	...	...	...	5 ,,

These returns are probably below the actual number.

CHAPTER XVII.

The action of Tobacco dust on workers in Tobacco factories; Dangers to pregnant women; Excessive mortality among children of the workers; International Congress against the abuse of Tobacco; Observations by Drs. Drysdale, Kostral and Omar Bey; The influence of Tobacco in causing abortion and abscess of breast; Children poisoned by Tobacco in the mothers' milk; Nicotism the danger in Turkey; Alcoholism and Nicotism the danger in England.

Dr. Hurteau, physician to the factory at Paris, stated that the workers were peculiarly liable to congestions. Kortial observed that women who worked in the tobacco factories were very liable to abortions. Nicotine has been found in the amniotic fluid surrounding the fœtus. It is also affirmed that the milk of women who work in the factories has a strong smell of tobacco. Buck also states that sexual development is retarded in young girls who enter tobacco factories, while the married women have very small families, average to each from three to four. Buck, author of "Hygiene and Public Health," also stated "when persons begin to work in the tobacco factories, they almost invariably suffer from headache, nausea and vomiting; they pass sleepless nights, and are troubled with diarrhœa. These symptoms are more common in females than males, and indicate poisoning with nicotine."

The late Dr. C. R. Drysdale, of London, observed that young boys and girls who were engaged as workers in the tobacco factories in London frequently suffered in health. The employers frequently denied these ill effects. The following account has been rendered by Dr. Kostral, Physician to the Royal tobacco factory of Iglan, near Vienna.

"These workshops at Iglan are well arranged and ventilated, but during the ten hours of work the operatives are exposed to an atmosphere charged with the dust of tobacco; this is found to be especially noxious to young workers recently entering the works, or to those just convalescing from illness. The majority of deaths among the children and work girls, which occurred during the first month of entering the works, were put down to nicotine poisoning.

"Of one hundred boys, from 12 to 16, who had recently entered the works, seventy-two fell sick in the first six months. The sickness lasted from two to twenty-eight days, and consisted especially in congestion of the brain, different nervous affections, pains in the region of the heart, palpitation, pallor, inflammation of the stomach, intestines, and lining membrane of the eyelids, with fever, lassitude, cold sweats, want of appetite and sleeplessness.

"The work girls had frequent disturbances of their health, and were very frequently pallid and breathless. Among those who were mothers and suckled their infants, there was often inflammation of the breasts, and the milk smelt strongly of tobacco. Besides this, of five hundred and six births which took place among these children in three years, Dr. Kostral found that eleven were still-births, and two hundred and six died soon after birth. One hundred and one of these died of brain disease with convulsions, and one hundred and ten died in the first three months of life, one hundred and sixty in the first six months, and one hundred and eighty-one in the first year. It was a curious fact, too, that the major part of these infants died when they were from 3 to 4 months old, just when their mothers returned to work, and gave their children breast-milk poisoned with nicotine. These facts are conclusive as to the evil effects of smoking and tobacco products upon the health of infants, children, and adolescents of both sexes."

We may infer from these facts that pregnant women, and those who are suckling their children, should not be exposed to tobacco smoke.

At the International Congress against the abuse of tobacco, Dr. Drysdale spoke of the injury done to the heart's action by smoking, and to the frequency with which smokers and chewers become affected with blindness. The use of tobacco was very deadening to the intellect.

A Turkish Medical man, Dr. Omer Bey, observed that in Turkey: "It was not alcoholism that caused injury to health, but tobacco. It kills the individual person, the race, and enervates the country. Nicotism in my country is what alcoholism is in France, and morphinism is in Eastern Asia. In Turkey, people do not drink, thanks to the abstinence enjoined by the Koran, but they smoke everywhere and for ever; it is for this reason that we may conclude that nicotism is a question more important in my native land than alcoholism."

These observations of Dr. Kostral prove that pregnant women are peculiarly liable to be poisoned by inhaling an atmosphere full of tobacco dust. He reported that the milk of those suckling their infants was poisoned with tobacco, and proved fatal to the children. He also reported that the mothers often suffered from inflammation of the breasts.

I would call the reader's attention to the fact already mentioned in Chapter XII, that the rate of abscess of breast among 1,000 wives of non-smokers was 80, while among the wives of smokers it was 263. I have also shown that the wives of non-smokers had 394 miscarriages, and the wives of smokers 1,035 miscarriages to 1,000 wives. These facts justify me in classing tobacco among the poisons which produce abortion and abscess of the breast. The evidence of these independent observers confirms the accuracy of my conclusions deduced from my histories.

Dr. Playfair writes as follows: "Important as are the causes of abortion, arising from some morbid condition of the ovum, they are not more so than those which depend on the maternal state; and it is to be observed that the former are often indirect causes produced by primary maternal changes. Many of these maternal causes act by causing hyperæmia of the uterus, which leads to

extravasation of blood. Thus abortion is apt to occur in women who lead unhealthy lives, such as those who occupy over-heated and ill-ventilated rooms; or indulge to excess in the fatigues and pleasures of society, in the use of alcoholic drinks and the like.

"Many diseases strongly predispose to it, such as fevers, zymotic diseases of all kinds, etc. Many other morbid conditions of the blood also dispose to abortion. It has been observed to be a frequent result of lead poisoning; also of the presence of noxious gases in the atmosphere, such as an excess of carbonic acid. Many causes act through the nervous system, such as fright, anxiety, sudden shock and the like."

It is my own opinion that a pregnant woman should never be exposed to the risk of inhaling or absorbing tobacco smoke, lest it should injure the fœtus.

It is dangerous for a pregnant woman to be in a room where a person is smoking, or has been recently smoking. In the latter case small quantities of nicotine, which have been condensed on the walls, may still be present in the atmosphere for many hours. A French chemist has recently demonstrated that one gramme of tobacco smoked in cigarette form yielded 20 to 80 cubic centimetres of carbon mon-oxide gas, and in pipe form 53 to 100 cubic centimetres. This gas is a deadly poison, and is readily absorbed by the blood, forming a definite chemical compound with the hæmoglobin, which prevents the oxidation of the blood. Breathing an atmosphere containing even so little as ·07 per cent. has very deleterious effects. There is also an excess of carbonic acid gas in tobacco smoke.

A woman is not always at liberty to leave a room which contains tobacco smoke when she feels the bad effects of the poisonous atmosphere, consequently her blood becomes highly charged with poison, and if she is pregnant the fœtus probably receives the poison into its blood. If the dose be small, it may retard development of the whole body, or set up disease of the brain or some general nervous disorder. If the dose be large it may set up convulsive movements, which may set up hæmorrhage and end in abortion. I suspect that a large number of congenital diseases originate in this manner. Nicotine has been proved to be present in the liquor amnii;

it is therefore probable that many embryos are surrounded by tobacco polluted water within the wombs of their mothers.

The action of tobacco dust on the unborn infants is clearly proved by the records of Dr. Kostral. Out of 506 births which took place, 206 children died soon after birth, of which 101 died of brain disease with convulsions. Tobacco is known to be a brain poison, and it appears that the children of the mothers who work in the tobacco factories are born of feeble vitality, poisoned by tobacco. The evidence contained in my histories proves the low vitality of the children of smokers. The rate of mortality for a 1,000 children of non-smokers is 153, the rate for smokers is 227. Dr. Kostral's rate of mortality is 407 to 1,000 living infants.

Tobacco and Infancy.

Dr. Etienne, of Nancy, made notes of the infants deposited at the Crêche, belonging to the mothers who worked at tobacco factories. He had 93 children under observation. He classified them into five groups. First, came infants entirely breast-fed by the mothers who kept away from the tobacco factory, and, secondly, infants similarly reared whilst the mothers continued to work there. The third class included infants exclusively breast-fed at first, and afterwards reared exclusively by the bottle; the fourth consisting of infants more irregularly reared by the mother, the bottle, and the wet nurse. Lastly, came the fifth class, infants brought up exclusively and from the first on the bottle. The total infant mortality was, however, absolutely high, being double the average registered as that of the total working-class in Nancy. Infants of the second class above noted are almost certain to die.

On the other hand, as might be expected, the first class comes out best of all. Of course, in any working population, especially in factories, the child does best if the mother is allowed a holiday when she nurses it, but the extreme contrast between the mortality in the first two classes, in both of which the child was exclusively fed by the mother, plainly shows that tobacco is specially prejudicial to the infant.

The remaining Classes show rather a high mortality, but fall far below the second Class. The third, fourth, and fifth Classes include all the infants of tobacco factory women, which were fed artificially or by wet nurses, whilst the mothers returned to work; but the mortality was higher than what might be expected in artificially-reared babies in factory towns, and that mortality, we know, is very high, even in districts far from tobacco works. In the interests of the population, a serious question in France, Dr. Etienne recommends that work women should be forbidden to suckle their children when actively employed, but should be allowed a holiday of at least one month after delivery, in order to nurse their infants, since at the end of that time the latter can be reared artificially with comparative safety. Vide *British Medical Journal*, p. 1,094, Vol. 1, 1898.

CHAPTER XVIII.

MARRIAGE; TABLE OF STERILITY; CAUSES OF THE FALLING BIRTH-RATES IN GREAT BRITAIN AND HER AUSTRALIAN COLONIES AND IN MANY EUROPEAN COUNTRIES; STERILITY IN THE MALE AND FEMALE CONSIDERED SEPARATELY AND TOGETHER; OPINIONS OF CURLING AND ARTHUR COOPER ON CAUSES OF MALE STERILITY; OPINIONS OF DR. MATTHEWS DUNCAN ON CAUSES OF FEMALE STERILITY; TABLES SHOWING AGE CONSTITUTION OF BACHELORS AND SPINSTERS AT TIME OF MARRIAGE.

MARRIAGE is defined as the act of uniting a man and a woman for life; it is a contract both civil and religious by which the parties engage to live together in mutual affection and fidelity till death shall separate them. It was instituted by God for the purpose of preventing the promiscuous intercourse of the sexes, for promoting domestic felicity, and for securing the maintenance and education of children.

The importance of marriage cannot be over-estimated in relation to the husband and wife; marriage either makes or mars the fortunes of a man and a woman. The welfare of a nation depends on the number of good and fruitful marriages. People make a mistake if they consider the first duty of a man is to make money or gain knowledge and position. The first command from the Creator to man which has been recorded referred to marriage. "And God blessed them, and God said unto them, Be fruitful and multiply and replenish the earth and subdue it" *(Genesis* i.) We learn from Holy Scripture that

unfruitful or barren marriage was looked upon by the Israelites and Jews as a disgrace.

An essential condition for normal fertility is, that the husband and wife be in good health at the time of marriage, which means that their blood must be normal in quality and quantity, and free from any trace of poison, such as tobacco, alcohol, opium, lead, &c.

There is a tendency in modern times, among some medical men, to regard the sterility of a married couple as due to a defect of the wife alone; this is obviously an error of judgment. In order that a married couple can produce a healthy child, it is absolutely necessary that the blood of both parents be in a healthy condition, and also that the organs concerned in generation be capable of performing their functions. It is also necessary that the wife should live under healthy conditions during the whole period of pregnancy; otherwise the ovum would become diseased and might die, in which case it would be thrown off.

Most married people desire to have children, and it may be regarded as a natural and healthy instinct, one that should be encouraged. We are distinctly told that marriage was ordained for the procreation of children. If a woman does not desire motherhood she has no right to become a wife, unless as an old man's companion. God uses no compulsion—there is no commandment that every man must take a wife, because such is not required. The desire to possess a wife develops naturally in most healthy men.

It is, however, most important to observe that God requires every man to use his best efforts to preserve his health, not only for man's personal happiness, but that in order, in the event of his entering the married state, he may procreate healthy, vigorous and perfect children, with healthy moral instincts. Should not every youth at the age of puberty be encouraged to live a pure and healthy life, and to maintain the purity of his blood, by living in a pure air when possible, careful in his diet, and avoiding tobacco, and all excess in alcoholic beverages? The age of puberty should be a period of preparation for matrimony in both sexes.

I do not approve of our present system of keeping men at college after they have attained the age of 21, unless they can at the same time enter matrimony. It is the

law of nature for men to enter matrimony when mature and fit for the duties. The law treats a boy as an infant to the age of 21, and makes him a responsible agent on reaching that age. That is the best age for a man to marry ; the woman's best age is between 19 and 21.

The causes of sterility and feeble fertility have been chiefly studied by two classes of medical men, those who have made a speciality of the diseases of the male organs of generation, and those who have been gynecologists or specialists in the diseases of the female organs of generation. There is a general belief that excessive smoking produces impotency in the male. A striking instance of this was recorded by Dr. Tyrrel in *The Lancet*, vol. I., 1857. It occurred in a newly married man ; he recovered potency when he abstained from tobacco, but when he resumed smoking the impotency returned. The following statement will be found in Curling's work on " Diseases of the Testis."

" It has been confidently asserted that excessive indulgence in tobacco smoking weakens or destroys the sexual powers. I know of no facts to warrant the belief that tobacco exerts a special sedative effect on the genital organs, or that such injurious influence results from the habitual practice of smoking it in moderation. The Germans, whom we should regard as excessive smokers, evince no failure in the reproductive functions ; and although the importation of tobacco into this country has largely increased in recent years, the Registrar General's Reports exhibit no corresponding decrease in the population. The intemperate use of tobacco, however, by chewing, is very liable to impair the digestive organs and lower the nervous force, and I have no doubt whatever that its depressing influence is likewise manifested in a diminution of the sexual powers. In several cases of impotency with dyspepsia, in persons between 30 and 40 years of age, I have found on inquiry that they were either inveterate smokers or habitual chewers of tobacco, and no treatment proved effectual without great restriction in these customs. Opium, whether chewed or smoked, is still more hurtful than tobacco. There is ample evidence of impotence being a common effect of indulgence in this pernicious drug."

This book was published in the year 1878, therefore the statement that the birth-rate in England showed no sign

of decrease on account of the increase of smoking is inaccurate. The birth-rate began to decrease in 1877, and has been falling ever since. It is true that when Mr. Curling wrote, the state of the national birth-rate did not cause general alarm. Mr. Curling's view, with regard to the birth-rate in Germany being normal, cannot be maintained at the present day. The official returns show that it has fallen from 38·6 per 1,000 living in 1881, to 32·1 in 1909.

Mr. Curling wrote as follows on the functional disorders of the male sexual organs: "These disorders may be conveniently considered under three heads, impotency, sterility, spermatorrhœa. By the first is understood absence of sexual desire, or defective power of copulation, which necessarily also involves the second. But I shall have to show that a want of aptitude to impregnate may co-exist with the capacity for sexual intercourse; or in other words, that man is subject to sterility independently of impotency." Here is a clear statement by an eminent surgeon, that man is subject to sterility, without being impotent.

In order to avoid confusion I will define the terms used in speaking of these diseases. Any deviation in function from the normal constitutes disease; for instance, excessive lachrymation or salivation is disease, and absence of children among young married people is the disease called sterility. My present purpose is to trace the influence of the smoking habit in promoting sterility. Nicotine is one of the most powerful drugs known, and it is unreasonable to assume it can be absorbed habitually without causing impotency, spermatorrhœa, and sterility.

Potency means the ability to perform the sexual act. It may exist in a man who is suffering from constitutional diseases, such as syphilis, phthisis, nicotism* alcoholism, or lead poisoning.

Impotency means inability to perform the sexual act: it is sometimes associated with spermatorrhœa, and is a frequent condition among men who smoke to excess.

Virility is usually defined as ability to procreate one or more healthy children.

*Nicotism = nicotinæmia = blood poisoned with nicotin.

Sterility. When a woman of conceptive age co-habits for many years with a healthy male, and has no conception, we cannot tell which is in fault, and suspicion often wrongly falls on the woman; and she is described as absolutely sterile. A woman who bears less than the normal number of children is described as being comparatively sterile. When a married couple produce a number of healthy boys and girls we have evidence that their generative functions were normal, and we describe their fertility as high, moderate, or low, according to the number of children born. Much light has been recently thrown on the sexual disabilities of man by Mr. Arthur Cooper, who has written a work on that subject. The book deals with male sterility and impotence. I will quote the introduction verbatim, as it is suggestive and likely to stimulate enquiry into the influence of tobacco in promoting sterility:

"The chief sexual disabilities of civilised man may be broadly divided into:

1. "Those depending on some defect in the seminal fluid, or on some condition which prevents its natural discharge—causing sterility.

2. "Those depending on some defect in the apparatus concerned in the act of copulation—causing impotence. They may be present together or separately.

"As regards male sterility, it is only in recent times that much attention has been paid to it, and even now, in this country at any rate, it does not receive the notice it deserves, notwithstanding its importance to the individual and the family, as well as its influence on the birth-rate of the general population.

"The proportion of barren marriages, in which the husband is at fault, has been variously estimated by different observers, as from ten to twenty-five per cent., and by some even higher still. Dr. Matthews Duncan called attention to the matter in the Gulstonian Lectures in 1883 and again in 1889, he wrote:

"Enlarged experience and enquiry make me more and more convinced of the greatness of the part played by the male . . . . .

"It is a good rule to subject a women to no prolonged, painful, or dangerous treatment for sterility, unless assured of the potency of the male as regards connection and as

regards the semen. But even now this good rule is not always observed in practice, and it not uncommonly happens that unless the husband is clearly incompetent as regards copulative power, the fault is as a matter of course attributed to the wife, and only when the gynecologist has failed is the husband suspected and submitted to examination.

"Impotence, on the other hand, has been from time immemorial a matter of anxiety to a vast number of mankind, so that whilst it is quite common for medical advice to be sought respecting the copulative power, it seems to be comparatively rare for a man before marriage to have any sort of doubt or anxiety respecting his procreative power. And this, in spite of the fact that it has long been known that a man may be able to perform the sexual act to his own complete satisfaction and yet may be quite incapable of begetting children.

"In the following pages an attempt will be made to consider these, and some allied conditions, not as special entities to be dealt with always in some special way, but as phenomena, to be investigated and traced to their source like other morbid phenomena, and therefore as a branch of the art of medicine, which ought to be studied and taught in the ordinary medical curriculum."

It is impossible to read through this book without wondering how the author could have overlooked the far-reaching influence of the tobacco habit. In the chapter on impotence he refers to the prevalence of "impotence with irritable weakness" as the result of over-sensitiveness of the sexual centres. We know that all narcotics cause nervous weakness and paralysis, and thus become factors in promoting impotence. When alcohol is taken to excess it acts as a narcotic, and produces impotence, but as soon as the alcohol is eliminated the nervous centres regain their active powers, and the man recovers his potency.

The number of men who suffer from organic diseases of the sexual organs or syphillis is relatively small. We are now inquiring into the causes of sterility, which has recently assumed alarming proportions, not only in England, but in all her colonies, except Canada, Jamaica and Ceylon.

The evidence of its extent is the falling birth-rate in England, Scotland, Ireland, New South Wales, Victoria,

Queensland, South Australia, Western Australia, Tasmania, New Zealand ; and in the following countries of Europe : Denmark, Norway, Sweden, Finland, German Empire, Prussia, Austria, Hungary, Roumania, Servia, Holland, Belgium, France, Switzerland, Spain, Italy, and Chili. All these countries show a very serious decline within the last thirty or forty years, except Roumania, where the decline is slight. Sterility, when progressive, must end in annihilation ; therefore to prevent this progress we must find out its causes and remove them if possible.

From the earliest times, a few women have been denied the gratification of becoming mothers. We read of them in the Bible, but in recent times the numbers of married women afflicted with sterility have been increasing rapidly. We cannot attribute this international increase in sterility as the result of the publication of evil literature suggesting abominable interference with the generative functions. It is incredible that the instincts of men and women could be suddenly perverted by a few doses of foul literature scattered among the civilized nations of the world, who are believers in the Old and New Testaments, or even the Old, to wit, the Jews. It is equally ridiculous to attribute this sudden increase in sterility to the influence of gonorrhœa. This disease existed in Europe long before the birth-rate began to fall, which was only thirty or forty years ago. Yet a German medical man recently suggested that gonorrhœa was the chief original cause of male sterility.

There is another international problem closely associated with sterility. The birth-rate gives no indication as to the health of the infants, it only counts numbers, therefore it is but an incomplete standard for indicating the procreative power of a nation. It must be remembered, therefore, that the subject of infantile mortality should be studied together with sterility.

There is yet another scourge of humanity that must be studied with intelligence, I refer to the rapid increase in the numbers of children who show signs of congenital defects of mind and body. The class of feeble-minded children has become enormous. It is demanding serious attention in America, where these unfortunate children seem to abound. All these facts indicate that these countries which suffer from progressive sterility also show

a progressive series of defects in many of those children who are born alive. That means that the quantity of children born is less, and their quality deteriorating.

Mr. Arthur Cooper has carefully described various defects in the semen of men suffering from sexual disorders, and has discovered a deficiency of spermatozoa (zoosperms) in some cases. In some cases they were absent or dead (azoospermia). The wives of such men were barren.

After mentioning special diseases which cause sterility, he recommends that alcohol or "other drugs," when suspected as being harmful, should be abandoned. I hope that many readers of this book will thank Mr. Cooper for his warning against the abuse of "other drugs," and remember that tobacco is merely a drug, a weed, and is included in the category of things to be avoided.

I agree with the advice of Dr. Matthews Duncan, that in every case of sterility the husband should be examined first.

The poison of nicotine may be mixed with semen, and cause serious disturbance of the sexual functions. Defects in the semen have not yet been traced to tobacco. The smoker also suffers from an irritable condition of all the nervous centres from nicotine poisoning. When nicotine enters the blood—the source of life—the blood contains a powerful chemical toxin, this condition may be called toxæmia, nicotinemia, nicotism, or general narcotism.

I will now treat of the causes of female sterility. Female sterility is defined as want of reproductive power in the female. This is an imperfect definition.

Dr. Matthews Duncan, in the Gulstonian Lectures, stated that he had collected histories of 4,372 women between the ages of 15 and 45. Of these, 3,710 had first living children ; 665 marriages were sterile, or one in six ; or, in other words, 15 per cent. of all the marriages were sterile. The dead-born were not included, and thus the actual sterility was less than the figure stated. Other calculations represent sterile marriages, one in eight, one in ten, and among British Peers, one in six.

Dr. Matthews Duncan also stated that the number of married women in the better classes who were absolutely sterile, and had never conceived, could not be estimated, but was certainly very great.

He said he was consulted in five years in 504 Cases by absolutely sterile women married between the ages of 15 and 45, and of these 337 were more than three years married. The following Table gives a classification of these 504 married and absolutely sterile women according to age at marriage and number of years married :

	YEARS MARRIED.							
Age at Marriage.	under 3	4-8	9-13	14-18	19-23	24-28	29	Totals.
15-19	12	19	15	4	7	2	1	60
20-24	70	66	37	24	13	9	—	219
25-29	47	51	20	8	8	—	—	134
30-34	26	20	8	4	1	—	—	59
35-39	6	13	4	—	—	—	—	23
40-45	6	3	—	—	—	—	—	9
Totals	167	172	84	40	29	11	1	504

He said, "It is not a rare observation, and I have one before me, where the easy birth of a single child exhausted the fecundity of a healthy woman, 25 years of age at the time of the birth, and completely ruined her general health during the remaining child-bearing period of life. This woman was examined by many physicians, and all concurred in finding no cause of weakness and inability but child-bearing. On the other hand, Ansell records the case of a woman married at 21, who in twenty-seven years gave birth to twenty-five children, who all reached adult age, and the mother died of old age at 88.

The fact that one physician was consulted by 504 patients within five years, who wished to have children, may be considered evidence that the majority of married women desire to become mothers.

The following statements were made by Dr. Matthews Duncan : "Women, under favourable circumstances, bearing less than ten children are relatively sterile."

According to the Registers of Edinburgh and Glasgow he found among the fertile wives, married at various ages, a fertility of between seven and eight. "Now, as many women are married some years after the best period for commencing child-bearing, we may, by making allowance for such delay, raise the number from between seven and eight to ten, the number indicated by the St. George's-in-the-East Table."

Dr. Matthews Duncan wrote as follows:

"I have long been impressed with a belief, in accordance with the chief pertinent facts, that the excess of female births is due to the prevalence of a degree of weakness of reproductive energy. Excess of female births is co-incident with other evidences of sterility." He states that twins occur about once in every eighty pregnancies. He considers the occurrence of twins or triplets an indication that the marriage has taken place too early or too late; he stated, "I know no cause of sterility or of its allies, excessive production, pluriparity, abortion, etc., that can be compared with age in extent and power."

Among minor causes, he gives bad general health, cold and heat. Further on he remarked that "the course and the details of the argument in these lectures point to a law or laws of sterility not yet clearly formulated. Deficient reproductive energy, or want of sexual vigour, is a theory too vague to be satisfactory. Deficient reproductive energy in woman is shown by absolute sterility, by relative sterility, by abortion or miscarriage, or morbid pregnancy, or children diseased, or difficult to rear, or destined to peculiar diseases during extra-uterine life. Deficient reproductive energy cannot be regarded as a substantive disease with specific characters, course, and remedies. It is a constitutional condition which, according to its cause, may affect a population or certain classes.

"During the last thirty years, gynecology has made great and rapid strides of substantial progress, and, naturally, sterility as part of it has swollen in bulk, but the growth of it has not been satisfactory, for it has not a sure foundation. While our general knowledge of sterility in woman has made little advance, and especially that part of it which might be turned to practical account, the curing of sterility has reached great dimensions. As in

other departments of therapeutics, there has been a great failure of logic; the *post hoc* and *propter hoc* have been confused—a coincidence has been regarded as a consequence. The credulity of patients and of doctors has been a basis of useless and often injurious practice. It is scarcely an exaggeration to say that in recent practical works on sterility there is exhibited entire ignorance or neglect of the laws of fertility. Every woman from 15 to 45 is regarded as likely to breed. If she be sterile, a cure is at once set agoing, and if a child be not born, the failure is not debited to the nature of the case, but to the want of ingenuity in the doctor. A reputation for curing sterility is spoken of as if it were on substantial claims. The prevalent methods of curing sterility are founded on an implied theory that it in most cases arises from impediments in the way of the spermatozoa reaching the ovum. Without sufficient evidence, strictures are assumed to exist, versions and flexions of the womb are held so to distort the interior passage as to prevent progress of the spermatozoa; cervical catarrh is believed to stop them by mechanical obstruction, or by chemically poisoning them; and for these real or imagined evils, sterile women are made the subject of treatment. It is the theory of mechanical obstruction that, by its simplicity and directness, has possessed the profession and the public, and accordingly many operations and modifications of operations, and very many instruments have been devised to do away with the obstruction. The theory has had real rational support in the fact that dysmemorrhœa of a spasmodic kind does, as already shown, frequently accompany the sterility, and, in the supposition that the same obstruction which causes sterility by impeding the entrance of semen, causes also dysmemorrhœa by impeding the exit of menstrual blood, or vice versa. It has had still more satisfactory support in the observation that the cure of the dysmemorrhœa does occasionally bring with it cure of the sterility.

"The great mass of sterile women have the appearance of good health. The immoderately great consumption of alcoholic drinks by women, without their necessarily ever reaching the stage of drunkenness, is so common, and so potent a cause of disorder and disease, that it requires special mention. It is possible that much of the influence

of this drinking might be justly ranked as part of mere overfeeding. Alcoholic drinking induces chronic ovaritis. When it is present, sterility is not always the result, but frequently so, and its cure is often followed by the disappearance of the sterility. Spasmodic dysmenorrhœa is a most striking morbid condition connected with sterility ; no other local disease has such importance, this is often a curable disease. During recent times, no disease has more engaged the attention of gynecologists than the catarrh and peculiar changes of the cervix uteri connected with it. There is no evidence that it can prevent conception." (See Gulstonian Lectures, *British Medical Journal*, vol. 1., 1883).

I am unable to agree with the opinion that the most potent factor in promoting sterility and feeble degenerate children is marriage too early or too late. The statistics of the Registrar General for the last twenty-two years clearly demonstrate that the number of marriages among minors, bachelors, and spinsters, has been steadily decreasing, thus raising the age of marriage, vide Table IV. (taken from the Seventy-first Annual Report of the Registrar General in England, 1908).

Broadly speaking, the ages of the men at marriage are, so far as concerns the growth of population, of less importance than the ages of women at marriage. The fact that child-bearing is practically limited to the period between the ages 15 and 45 years, and that the fertility of women is highest at the earlier age groups, makes it evident that any great alteration in the ages of women at marriage must necessarily have important effects on the birth-rate. The Tables show that the favourite period for marriage in both sexes has been and is between 21 and 25.

We might expect that the later age of marriage of recent years in both sexes would result in a larger number of healthy children. We are face to face with this extraordinary fact, that the marriage rate, which in 1886-1890 averaged 14·7 for that quinquennial period, rose to 15·3 for the quinquennial period 1904-8 ; but strange to say, the birth-rate, which in 1886-90 had been 31·4 per thousand, fell to 27·0 in the years 1904-8. I have prepared Table V. to make this postponement of marriage very clear.

Table IV. Showing the age constitution of Bachelors and Spinsters who married, reduced to 1,000 Marriages, at all ages, 1886-1908.

Period.	All Ages.	MINORS.				FULL AGE.								Age not stated.
		Under 18 Yrs.	18—	19—	20—	21—	25—	30—	35—	40—	45—	50—	55 and Upwards.	
BACHELORS.														
1886-90	1,000	0	4	20	47	424	309	96	33	13	6	3	2	43
1891-95	1,000	0	3	17	43	415	333	108	37	14	6	3	2	19
1896-1900	1,000	0	3	15	39	411	346	110	39	15	6	3	2	11
1901-5	1,000	0	3	13	35	390	360	122	41	16	7	3	2	8
1906	1,000	0	3	12	32	380	368	127	43	16	7	3	2	7
1907	1,000	0	2	11	31	379	368	130	44	16	7	3	2	7
1908	1,000	0	2	11	30	374	369	132	46	18	7	3	2	6
SPINSTERS.														
1886-90	1,000	9	37	72	97	417	219	62	23	10	5	2	1	46
1891-95	1,000	7	31	66	94	425	241	70	25	11	5	2	1	22
1896-1900	1,000	6	27	59	89	434	253	74	26	11	5	2	1	13
1901-5	1,000	5	23	53	82	428	272	79	28	12	5	2	1	10
1906	1,000	5	22	51	77	428	278	83	28	11	6	2	1	8
1907	1,000	5	22	48	76	423	281	85	29	12	6	2	2	9
1908	1,000	5	21	48	75	419	282	88	31	12	6	3	2	8

TABLE V.

MINORS PER 1,000 MARRIAGES.

	Bachelors.	Spinsters.
1886-90 ...	71 ...	215
1908 ...	43 ...	149
	Decrease 28	Decrease 66

Ages.	BACHELORS.		SPINSTERS.	
21-24	1886-90—424	1908—374	1886-90—417	1908—419
25-29	,, —309	,, —369	,, —219	,, —282
30-34	,, — 96	,, —132	,, — 62	,, — 88
35-39	,, — 33	,, — 46	,, — 23	,, — 31
40-44	,, — 13	,, — 18	,, — 10	,, — 12
45-49	,, — 6	,, — 7	,, — 5	,, — 6
50-54	,, — 3	,, — 3	,, — 2	,, — 3
55 and up	,, — 2	,, — 2	,, — 1	,, — 2

It cannot be possible that the later age of men and women at the time of marriage can account for the rapid increase of sterility in England and other countries.

Dr. Grünewald, a gynecologist in St. Petersburg has studied the subject of sterility, and stated that it depended on diseases of the female sexual organs, chiefly endometritis, mesometritis, perimetritis and parametritis. He seemed to think all cases of sterility might be cured by local treatment of the uterus and its appendages. His views are too limited.

Dr. Matthews Duncan was rightly considered a great authority on gynecology, he was a cautious speaker and a wise physician. He stated his views as to the nature and extent of sterility, and he confessed that the great "law of sterility" was unknown. He recognised there was an abnormal influence interfering with fertility among women who appeared to be healthy, and were anxious to bear children, and who were free from disease of the sexual organs.

It is remarkable that his lecture was entitled "Sterility among Women." His professional work was solely among

women ; it appears to me that he became so absorbed in studying the diseases of women that he fell into the error of looking for the causes of sterility among women alone. He did not make any investigations about the health or the habits of the husbands of these sterile women, and consequently he failed to find a cause for the majority of cases of absolute or partial sterility, and the decreasing ratio of male to female births, etc. For similar reasons other gynecologists have fallen into the same error, and have failed to recognize that the most common cause of female sterility is the abuse of tobacco by males.

After further experience, it appears that Matthews Duncan suspected that sterility was chiefly due to loss of procreative power in males, and he expressed this view in his last lectures in 1889. When we come to argue the causes of the falling birth-rate in so many countries, we must commence the enquiry with open minds, and first try to discover which sex is at fault.

First, inquire about the male and his habits. Sterility was a rare disease until the last thirty or forty years, though it has probably been increasing unperceived for several centuries. It cannot be connected with climate, because it is present in so many different climates ; it cannot be dependent on poverty, because it is present to a larger extent among the rich than the poor ; it cannot be connected with any particular kind of food, because it exists in such opposite countries as England and Australia, where good and nourishing food is plentiful ; it cannot be dependent on the abuse of beer, wine or spirits, because these were generally abused before the fall of birth-rates.

With regard to the influence of compulsory education, which has been in force forty years, the result may be adverse to a slight degree, as girls have been over-taught, and have learned to dislike domestic life ; but there must be a more potent factor of an international character. It is well known there has been an enormous increase in the abuse of tobacco within the last fifty years in all parts of the world. In this we have an international cause for an international effect.

I have quoted two surgeons, specialists in diseases of the male sexual organs, who declare that many men who

are potent are nevertheless sterile; and this sterility is explained as due to a poisoned or defective condition of the semen. There must be some universally used poison to account for the universal decline of procreative power in men, and that must be tobacco. This opinion is confirmed by the results obtained from the comparison of the smokers and non-smokers in my histories. These histories give an accurate estimate of the procreative power of the two Classes I have shown in Table III., Chapter XII, where the rate of births for 1,000 men was:

Class 1, Non-smokers	7,368
Class 2, Smokers	6,859
Loss to smokers	509

Class 2 had a deficiency of 728 M., and an excess of 219 F.

This Table shows the exact degree of sterility that may be expected as a result of tobacco smoking, viz., a loss of 509 infants to every 1,000 married men. This loss is more serious than the figures represent, because the loss involves male issue to a larger extent than female; the consequence is, a serious inequality of the sexes at birth. When I find the same defects in the national birth-rate as exist in my two classes of smokers, I consider that the former substantiates the accuracy of my records, and, moreover, I consider that the absence of these defects among the two Classes of non-smokers is evidence that the abuse of tobacco is the source of the defects among the Class of smokers and their wives and children. My histories give an explanation of facts observed and classified in a scientific manner. The reports of the Registrar General show similar defects in the whole population, because the number of non-smokers is so small. Hence the same defects are present as in my classes of smokers, viz., a large degree of sterility, which penalises male issue more than female, and causes an excess of females (see sex ratios, Chapter XVI., and for those of general population see Table VI., Chapter XIX.)

When married women remain sterile for many years, while having frequent marital intercourse; it is but natural they should begin to suspect the fault is on their

side. I remember that when I was a Medical Missionary among the Nestorian Christians of Persia, I was once consulted by a woman who, after having borne six children, had ceased to bear ; she hoped I could give her medicine to increase her reproductive power. For the sake of my professional reputation I gave her a few of the mildest pills in my possession, and she went away happy. Among Eastern women the desire for many children is universal.

Is there reason to believe that in all those countries which show a falling birth-rate the women have acquired any habit, such as a drug habit, or a love of alcohol, that would account for the great failure of their reproductive power as indicated by the fall of the birth-rate? There may have been an increase in the abuse of alcohol, but not to such an extent as to account for such a result as we deplore. There has been an increase in the smoking of tobacco among women, chiefly in the form of cigarettes; but married women rarely smoke to excess, so we cannot attribute much importance to this habit. The higher education of women is a modern movement, which may be fraught with danger to health when pushed too far. It may predispose to uterine and ovarian disorders, and lower the general standard of health. There is in the present day a small section of women who, though married, desire to escape the responsibility and anxiety of motherhood, but their number is not sufficient to cause a marked fall in the birth-rate in near and distant countries.

I have failed to find that this want of reproductive power depends upon any cause which originates in the women, therefore this inability of women to bear healthy children in the same numbers as the women of the past generations, does not depend on degeneration or bad habits which originate in their own sex ; then this inability must originate in the male sex. This inability on the part of the men is a certain indication of some defect either in the semen, or the nervous system, or in both. I maintain that if the census of any nation which consists of non-smokers and smokers (who use the same sort of tobacco and in the same quantity as those in Class 2) be taken so as to separate the two classes, the birth-rates of the smokers would show the same defects, and the same excess of abortions and bad confinements as Class 2.

There must be some cause at work of a recent nature to account for the prevalence of uterine disorders and the accompanying sterility. Is it possible that the nicotine in the semen of the husbands is absorbed by the mucous membrane of the uterus, and sets up chronic inflammation of the cervix and dysmenorrhea, with sterility? The lymphatics and capillaries of the uterus rapidly absorb any poison of an organic or inorganic nature. It appears certain that the wives of smokers suffer greater risks than those of non-smokers in their pregnancies and confinements, for my histories prove it.

In case the reader is not yet convinced that I have traced the increase of want of reproductive power (and associated defects connected with child birth) among modern women to its true origin in the abuse of tobacco, I will review the position of the writers on sterility in man and sterility in woman. The former class of writers were not in a position to understand the nature of the diseases which afflicted the wives of their patients. When the wives were ill they had to consult a gynecologist. Large numbers of sterile women consulted the late Dr. Matthews Duncan, who had a reputation for skill and honesty of purpose. The remarks of his, which I have quoted, show his wisdom, for he recognised that the majority of sterile women were free from disease, and therefore he attributed the condition of sterility to some disease or defect in the males.

Among the gynecologists of all nations there is a tendency to attribute all the diseases of married women to various causes, local or constitutional, and to apply palliative treatment. They forget (except in the case of syphilis) that the semen of the male may contain a poison, like nicotine, derived from the blood, and that the poison may enter the blood vessels of the woman and set up local congestion and hyperplasia in the uterus, and originate the growth of a simple or malignant tumour. (For summary of defects, arranged as a rate for 1,000 smokers, see end of Chapter XII.)

There is truly a failure of reproductive energy among the wives of smokers. This defect was fully recognized as a common condition among the women who came under

the notice of Dr. Matthews Duncan, and he recognized that the majority did not suffer from any substantive disease which he could recognize, and he came to the conclusion there was "some law of sterility not yet known." A few years after he had uttered this opinion, he expressed the view that a large element of sterility was due to defects of males. He did not follow up the enquiry, or divide the patients who consulted him according to the habits of their husbands with regard to the abuse of tobacco. Therefore he acknowledged that he was unable to account for the increasing prevalence of sterility and the decreasing ratio of male to female births, and other defects connected with procreation, pregnancy, parturition, and lactation.

I have now proved that the male who poisons his own blood with nicotine may infect his wife with the same poison, and in the same way that the syphilitic male may infect the female, directly or through the ovum.

Dr. Furbringer, of Berlin, believes that sterility in the male is far more frequently the cause of barren marriages than is generally believed to be the case. He declared that "in several cases of sterile marriages, under his own observation, the unfortunate wife had been sent from one physician to another, and the cervix divided or her uterus scraped, until a glance at the microscope proved that nothing was wanted to ensure the blessing of children, excepting spermatozoa."

The influence of the healthy exercise of the generative functions produces mental and bodily health in both sexes, and when these functions are neglected or imperfectly performed the mind suffers, the spirits become low; in the male, melancholia sets in, and in the female, hysteria or insanity.

I firmly believe that the abuse of tobacco is the chief cause of impotency, spermatorrhœa and sterility. The amount of these diseases may be inferred from the amount of literature which has appeared during the last fifty years concerning their treatment. The writers have been content to consider the diseases were the result of old attacks of gonorrhœa, masturbation, and sexual excess; alcohol has not been blamed; and I think they were

right; but it is surprising they did not suspect tobacco. When tobacco smoking was first introduced into Turkey it was suspected of being a cause of sterility, and was forbidden; but the rule was relaxed, and smoking became universal, and is now a great evil among the rich Turks.

There is ample proof that my views are based on careful clinical observations. There is ample evidence of a high degree of sterility in Class 5, Chapter XV. In a total of fifty-one married couples, twenty were sterile, or two in five. If the wives were healthy at the time of marriage, and became neurotic after marriage, and also sterile, is not the assumption reasonable that their husbands were suffering from loss of procreative power through the abuse of tobacco?

The amount of misery and mental depression associated with and dependent on spermatorrhœa cannot be exaggerated. The chief symptoms of the disease are involuntary emissions of semen in the day-time, under the influence of mental excitement, or during sleep. The latter often occur in healthy single men, and are not of any consequence. Married men are great sufferers, for before the act of coitus commences, the semen is ejaculated. Writers on this subject have attributed the premature ejaculation to irritability of the nervous centres, and have overlooked the fact that an abnormal state of the semen may irritate the nerves of the seminal vesicles and set up reflex action. If nicotine be present in the semen it would be a local irritant and cause premature ejaculation.

Injury to the brain often causes temporary or permanent loss of sexual power, and it is certain that chronic disorders of the sexual organs, from whatever causes, in both male and female, are often the immediate precursors of insanity.

In support of my opinion that sterility more often depends upon faults in the males than the females, I may quote a statement made by Dr. Webster, to be found in the *Medical Times and Gazette*, July 4th, 1863, pages 18-20.

Dr. Webster made a list of 300 men who had been married at least five years, who had never begotten any children; except in one instance, where a child was born after the mother had remained barren during fifteen

years; and he thought the fault mainly depended upon the males. A large number of these sterile men were medical practitioners.

For information concerning the relation between disease of the male sexual organs and insanity, read an article by James Smyth, M.D., *The Lancet*, August 28th, 1841.

The following letters are taken from *The Lancet*, Vol. 1, 1857:

Dr. M'Donald wrote: "On woman smoking takes a sad hold; she soon becomes lazy and indolent, of dirty habits, and makes bad recovery from confinement."

J. Taylor, L.S.A., wrote; "The smoking youth of the present day exhibits a slothfulness, a want of energy, an indifference, a slowness of action in his business habits quite inconsistent with what we might expect to find in the unimpared energies at this period of adolescence."

Mr. Butler, M.R.C.S., gave valuable evidence from his experience in Australia: "While practising my profession for two years on the goldfields of Australia, I saw a great deal of what is there called 'Colonial disease.' Fever of the typhoid form was then prevalent. It was distinguished by a great failure of the nervous energy, and was most fatal to the hard worked, badly fed emigrant.

"I have observed that the inveterate smoker was the most difficult case for treatment.

"I have never lost one patient from dysentry who was not an inveterate smoker.

"I found it absolutely necessary to prohibit the use of tobacco during the protracted convalescence.

"As a Poor Law Medical Officer in Ireland, I have ample opportunities of observing the evil effects of smoking amongst the labouring classes of this country. A great number of old women in Ireland smoke, and any dispensary doctor in the country knows they are far from being the least troublesome of his patients."

John Tripe, M.D., Medical Officer of Health to Hackney, wrote: "During a practice of some years duration I have had many cases under my care, in which the symptoms

were due to tobacco smoking. They were: giddiness, temporary loss or dimness of sight, nausea in the morning, and most of the other symptoms of dyspepsia; in addition there were trembling of the hands, frightful visions at night, etc. The generative organs are also affected, and many of my patients who suffered from spermatorrhœa were great smokers.

"I have also met with two cases of acute poisoning by smoking, characterized by extreme prostration, sickness, a scarcely perceptible pulse, cold clammy skin, and pinched features."

For other articles on spermatorrhœa and impotence, see an article in *The Lancet*, Vol. I., 1854, by John Milton, M.R.C.S.; for fuller information read Curling, on "Diseases of the Testis"; Humphrey, on "Diseases of the Male Organs of Generation;" or Cooper, on "The Sexual Disabilities of Man," which contains a detailed account of the defects of the semen.

CHAPTER XIX.

TABLE SHOWING THE POPULATION OF THE UNITED KINGDOM EACH YEAR FROM 1821 TO 1910, WITH THE ANNUAL CONSUMPTION OF TOBACCO; TABLE SHOWING INCREASE OF POPULATION AND INCREASE OF TOBACCO CONSUMED IN DECENNIAL PERIODS; TABLE SHOWING THE FALL IN THE BIRTH-RATES IN THE UNITED KINGDOM, THE COLONIES OF AUSTRALASIA, AND THE CHIEF NATIONS OF EUROPE; TABLE SHOWING RISE IN BIRTH-RATES IN THE PROVINCE OF ONTARIO, CEYLON, JAMAICA, BULGARIA, AND JAPAN; TABLE SHOWING RELATIVE FERTILITY OF RICH AND POOR. REASONS FOR ATTRIBUTING THESE FALLING BIRTH-RATES TO THE RECENT INCREASE IN THE SMOKING HABIT.

IN the year 1903 I attended the meetings of the Royal Institute of Public Health, at Liverpool. I saw all the public institutions, hospitals, etc., and last of all I visited the warehouse where the tobacco is kept in bond. Its size is stupendous, being larger than the largest of all the buildings in Liverpool. I will now ask the reader to peruse the largest drug bill for which the inhabitants of the United Kingdom are responsible. The law does not allow the public to purchase poisonous medicines without a medical prescription, but it makes an exception with regard to tobacco, and any person over sixteen may buy as much of this drug as he likes. This bill is made out in lbs. avoirdupois, less moisture.

Table I.

Showing the Population of the United Kingdom from year to year, and the annual consumption of Tobacco (omitting the thousands in both).

Year.	Tobacco lbs. less moisture.	Population.	Year.	Tobacco lbs. less moisture.	Population.
1821	15 millions	20 millions	1896	68 millions	39 millions
31	19 ,,	24 ,,	97	69 ,,	39 ,,
41	22 ,,	26 ,,	98	73 ,,	40 ,,
51	27 ,,	27 ,,	99	76 ,,	40 ,,
57	32 ,,	28 ,,	1900	80 ,,	41 ,,
61	34 ,,	28 ,,	1	78 ,,	41 ,,
71	42 ,,	31 ,,	2	80 ,,	41 ,,
81	49 ,,	34 ,,	3	81 ,,	42 ,,
84	51 ,,	35 ,,	4	83 ,,	42 ,,
85	52 ,,	36 ,,	5	88 ,,	43 ,,
88	57 ,,	36 ,,	6	86 ,,	43 ,,
91	60 ,,	37 ,,	7	89 ,,	44 ,,
92	62 ,,	38 ,,	8	90 ,,	44 ,,
93	62 ,,	38 ,,	9	87 ,,	45 ,,
94	64 ,,	38 ,,	10	90 ,,	45 ,,
95	65 ,,	39 ,,			

N.B. Ninety million pounds of tobacco contain over three million pounds of nicotine.

In the year 1821, ... 20 million people

used 15 million lbs of tobaccco.

In the year 1831, ... 24 million people

used 19 million lbs. of tobacco.

In the year 1841, ... 26 million people

used 22 million lbs. of tobacco.

In the year 1851, ... 27 million people

used 27 million lbs. of tobacco.

In the year 1861,	...	28 million people
		used 34 million lbs. of tobacco.
In the year 1871,	...	31 million people
		used 42 million lbs. of tobacco.
In the year 1881,	...	34 million people
		used 49 million lbs. of tobacco.
In the year 1891,	...	37 million people
		used 60 million lbs. of tobacco.
In the year 1901,	...	41 million people
		used 78 million lbs. of tobacco.
In the year 1910,	...	45 million people
		used 90 million lbs. of tobacco.

This is painful reading for those who know the evil effects of tobacco on the moral and physical nature of man. Unless men can be persuaded to be moderate, and limit themselves to one smoke each day, we shall soon have no sailors to man our Dreadnoughts, no soldiers of any value, and no men fit to be husbands. A moderate smoker who uses three ounces of tobacco a week, uses 156 ounces a year ; an excessive smoker who uses one ounce a day, uses 365 ounces a year.

What is the meaning of this extraordinary craving after a poisonous drug, which has so often been condemned by medical men of all countries? The figures prove that the craving for tobacco has been steadily increasing year by year for ninety years. What will be the result? Which will fail first, the man or the drug? It is enough to make a man despair of his country to see such waste of health and wealth in a civilised country. Look at Table I. and remember what happened between the years 1851 and 1857. Our soldiers were dying from exposure to cold and want of food and clothing in the Crimea, through bad management and want of thought. The kind people at

home were moved with compassion, and gave money liberally to send supplies to the seat of war, and they considered that tobacco would be acceptable, and they sent out many tons of it. Consequently the returns for that period show a sudden rise in the quantity of tobacco taken out of bond. In the year 1857, a handful of medical men, full of zeal and love for their fellow creatures, raised their voices in protest against the smoking habit.

They proclaimed in the pages of *The Lancet* the evil results of tobacco when used habitually year by year. One man after another gave his experience of the diseases following the use of tobacco, but their words fell on deaf ears, and so the evil continued to grow year by year. No record has been kept of the awful fruits of this habit, because the smoking world lives in a "dreamland," and is content to be in a "fool's paradise." The problem is difficult: how shall a small percentage of non-smoking medical men persuade a large percentage of medical men to give up an evil habit? I answer that

"Nothing is impossible with God."

When the smokers find out that they are "kicking against the pricks" then we may hope they will desist. When they realize all the penalties of the habit, and its utter failure to promote human happiness, they will learn to let it alone.

I will now refer to the effects of emigration on the population of England and Wales. It is true that thousands of healthy energetic English men and women have left their native land and become settlers in other countries. This emigration has been counter-balanced by an influx of foreigners into England, so that our numbers have increased. The net result appears to be an increase in the number of smokers of tobacco. Probably the foreigners are mostly smokers. If my theory is true that tobacco-smoking is the chief cause in diminishing the birth-rate, then the exchange of Englishmen for foreign subjects in our land has been assisting the decline in the birth-rate.

In the year 1851, the consumption of tobacco reached an average of 16 ounces per head of the entire population. It increased each year until 1905, when it reached 32·88 ounces. The average for three years 1905,

1906, 1907 was 32·2 ounces per head. I hope this was high-water mark. The average for three years, 1908, 1909, and 1910 was 31·7 ounces; this represents a decrease equal to half-an-ounce per head per annum. I attribute this decrease as largely due to increased knowledge of the dangers of the habit, and to the crusade against juvenile smoking, and the publicity given to the moral and physical evils to boys and adults who indulge in the habit. The increase in the price of tobacco has also had some effect. I hope this decrease may continue year by year, for I feel confident that tobacco-smoking destroys health of mind and body and leads to poverty, disease, and misery, and therefore I earnestly pray that mankind may be delivered from the fascination of narcotism of every kind.

The procreative power of a nation can be roughly estimated by its crude birth-rate. As I have already declared in the form of a parable, a field that is planted with bad seed will be barren; a low birth-rate must not be regarded as evidence of an original defect in the female, independent of the male. A low birth-rate is a certain indication of feeble procreative power among the men. It is an indication of male sterility, and is largely due to impotence and spermatorrhœa from the abuse of tobacco. Look at Table II. and notice the extent of sterility and its increase in Great Britain and her Australian Colonies within the last thirty years. Do not tell me this is the result of artificial mechanical checks devised with the purpose of preventing impregnation or the result of self-imposed continence from economical motives. Do not tell me that it is due to diseases of the ejaculatory ducts of the testis (mechanical obstruction), the result of former attacks of gonorrhœa.

Table II.

The following Countries show falling Birth-rates.

Births per 1,000 living	*	1881	1886	1891	1896	1901	1909
United Kingdom		32·5	31·5	30·4	29·0	28·0	25·5
England and Wales	35·4	33·9	32·8	31·4	29·6	28·5	25·6
Scotland		33·7	32·9	31·2	30·4	29·5	26·4
Ireland		24·5	23·2	23·1	23·7	22·7	23·5
New South Wales		37·9	37·4	34·5	28·7	27·7	26·9
Victoria		31·2	31·3	33·6	27·2	25·7	24·6
Queensland		37·2	37·8	36·4	30·1	28·3	27·2
South Australia		38·6	36·8	33·9	29·0	25·4	24·7
Western Australia		33·9	39·2	35·0	22·7	30·4	27·7
Tasmania		33·4	35·5	33·4	29·2	28·4	29·9
New Zealand		37·9	33·1	29·0	26·3	26·3	27·3
Denmark	31·2	32·2	32·4	31·0	30·5	29·7	28·0
Norway		30·6	31·2	30·9	30·2	29·6	26·1
Sweden	31·2	29·1	29·8	28·3	27·2	27·0	25·6
Finland		35·0	35·3	34·3	32·1	32·5	31·3
German Empire	39·8	37·0	37·0	37·0	36·3	35·7	32·1
Prussia	38·6	37·0	37·7	37·7	36·9	36·2	31·8
Austria	39·9	37·5	38·1	38·3	38·0	36·6	33·5
Hungary	42·6	42·9	45·6	42·3	40·5	37·8	37·0
Roumania		41·5	42·2	42·3	40·7	39·3	41·7
Servia		45·7	42·0	45·0	41·2	38·0	36·5
Holland	35·4	35·0	34·6	33·7	32·7	32·3	29·1
Belgium	31·7	31·8	29·9	30·0	29·0	29·4	24·9
France	26·0	24·9	23·9	22·6	22·5	22·0	19·6
Switzerland	31·6	29·8	27·8	28·2	28·1	29·1	27·1
Spain	37·2	37·1	36·7	35·3	35·9	34·8	32·6
Italy	37·2	38·0	37·0	37·2	34·8	32·6	32·4
Chili		46·2	32·0	34·3	34·6	35·9	38·8

*Average in the twenty years, 1860-79.

All the above countries show a serious decline, except Roumania, which is slight. The birth-rate in Russia is stationary.

The statistics in this and the following chapters are taken from the Annual Reports of the Registrar General of England and Wales, except when stated to be from other sources. No statistics are kept in Turkey.

Table III.

The following countries show a rise in the Birth-rates.

	1881	1886	1891	1896	1901	1908-9
Province of Ontario, Canada	21·1	22·0	22·4	20·6	20·7	24·9
Ceylon	27·1	27·1	31·9	32·0	37·5	36·7
Jamaica	36·7	36·1	38·3	38·5	40·9	37·8
Bulgaria	33·5	32·3	38·9	41·0	37·5	40·4
Japan	25·6	27·3	26·7	30·0	32·7	33·9

The decline in the birth-rate, as shown in Table II., is admitted to be a cause of alarm and an international danger. It is the only indication of that mysterious disease known as sterility. It appears to me that sterility has become a serious disease in all civilized countries since the tobacco habit has taken firmer hold of mankind.

The present age is more abandoned to narcotism than alcoholism. We may fairly ascribe the declining birth-rate in Great Britain partially to the loss of healthy men and women who have emigrated to British colonies, and we recognize in our Table II. the excellence of the birth-rate in those colonies in the years 1881 and 1886; but from that time they have been steadily declining. It is not reasonable to attribute such a large decline to illegal practices, and abstinence from marital intercourse on economical grounds; nor can it be due to a slight raising of the age of marriage. The people in Australia have had prosperous times, and have grown rich. As wealth and luxury increased, so did the temptation to indulge in tobacco increase. It is a matter of common observation that the wealthy classes of Europe indulge more freely in tobacco than the poorer classes; it has also been proved that the poorer classes are more fertile than the rich. May not this be due to a more healthy state of the generative organs among the poor, owing to the smaller quantity of tobacco used by them.

The following Table of the relative fertility of the rich and the poor was framed by Dr. Bertillon, and may be found in the *British Medical Journal*, 1904, Vol. II. page 1116.

Table IV.

Births per 1,000 Women, aged 15 to 50, per annum, in different quarters of London, Paris, Berlin and Vienna.

Classes of Population.	London.	Paris.	Berlin.	Vienna.
Very poor	147	108	157	200
Poor	140	95	129	164
Comfortable	107	72	114	155
Very comfortable	107	65	96	153
Rich	87	53	63	107
Very rich	63	34	47	71
Average per 1,000 women	109	80	102	153

This Table clearly proves that increase in wealth is associated with decrease of fertility. Wealth and leisure afford increase of opportunities for indulgence in tobacco; therefore disease is greater among the wealthy men and their wives, and consequently they suffer from greater sterility than the poor.

We cannot maintain that the fall in the birth-rate in Great Britain is the result of continual emigration. It is a fact that people commenced to emigrate before the birth-rate began to fall; it is also a fact that most of those people who emigrated settled in British colonies, where there was a high birth-rate. As the colonists gained wealth they became more indulgent and smoked more and more with the natural result. Sterility became common among the smokers, who formed the bulk of the population, and the birth-rate was the only signal that caused alarm. A Royal Commission investigated the matter, and, so far as I know, they were unable to assign any satisfactory explanation. Many medical men in this country attribute the prevailing sterility to the adoption of artificial checks which were recommended in some vile book published in 1876, and which was widely read. The influence of that book has been exaggerated; the influence of the postponement of marriage by a few years has also been exaggerated. To shut one's eyes to the universal tobacco habit, and to fix on such factors as I have mentioned, is to "strain at a gnat, and swallow a camel."

All the nations that smoke to excess, and offer statistics of birth-rates, show evidence of comparative sterility by their steadily declining birth-rates. The only European country which has not a declining birth-rate is Bulgaria, which shows a rise. The only other countries which show a rising birth-rate are Japan, Jamaica, Ceylon, and Ontario.

The question of national importance is : To what cause, or causes, is the declining birth-rate due ?

I have proved in Chapters X. to XV. that tobacco is a powerful sterilizing agent, and therefore I do not hesitate to assert positively that the chief cause of the declining birth-rate is tobacco smoking. Table II. clearly shows that as the consumption of tobacco increased the birth-rates steadily fell.

Our falling birth-rate is one of the fruits of the tobacco habit throughout the Empire.

It seems strange that medical men, who have studied the causes of sterility, have not suspected tobacco poisoning in the husbands. The question has been investigated chiefly by gynecologists, who limited their observations to women, and looked upon sterility entirely as a disease of women, forgetting that sterility may depend entirely on the presence of nicotin, etc., in the semen of the husbands.

It is probable that male sterility is a common disease among heavy smokers. It appears to affect some smokers through the whole of their married lives ; there are no positive symptoms of its presence, but it may be suspected when healthy wives of a conceptive age remain barren after many years of marital intercourse.

Male sterility is an insidious disease which affects some men earlier than others. The sufferers are often unaware of their own condition, or if they recognize their infirmity are ashamed to seek medical advice. It is well known that a healthy man may retain his virility even beyond the age of 70, and may become the father of a healthy child.

There is one more defect, not yet referred to, which may be observed in the family histories of the smokers : the intervals between the pregnancies are shorter and more irregular than among the wives of the non-smokers. It is an advantage to have an interval of about two years between each confinement, as existed in Case 2 (page 85) and Case 8.

The birth-rate in the United Kingdom in the year 1881 (census year) stood at 32·5 per 1,000 of population ; it has fallen steadily to 25·5 in 1909. Decline equals 7 per 1,000.

The falls in the Australian Colonies since 1881 are as follow :

TABLE V.

SUMMARY OF DECLINE OF BIRTH-RATE IN THE BRITISH EMPIRE.

	1881	1909	Fall
New South Wales	37·9	26·9	11·0
Victoria	31·2	24·6	6·6
Queensland	37·2	27·2	10·0
South Australia	38·6	24·7	13·9
Western Australia	33·9	27·7	6·2
Tasmania	33·4	29·9	3·5
New Zealand	37·9	27·3	10·6

The birth-rate of each nation is judged by comparison with the highest recorded birth-rate of all the nations. There is no fixed standard of perfection for purposes of comparison ; therefore, we cannot be certain that the highest of all the recorded birth-rates for the three years 1906, 1907, 1908, that of Bulgaria, is perfection. The only birth-rate which approaches Bulgaria is Roumania. I have no knowledge of the habits of the people in these countries, and I will not attempt to give a reason for their pre-eminence in fertility. The following figures show a high degree of sterility in the different parts of the British Empire in comparison with these two European countries.

Birth-rate.	Mean of three Years.	
	1881—2—3	1906—7—8
Bulgaria	36·1	42·7
Roumania	41·6	41·0
England and Wales	33·7	26·3
New Zealand	37·2	27·3
New South Wales	37·5	27·0
Ontario	21·9	23·7

CHAPTER XX.

Analysis of birth-rates of Smokers and Non-Smokers; Cause of low birth-rate traced to great loss of virile power among men, the result of habitual abuse of Tobacco; Table covering a period of seventy years, showing marriage rate, birth-rate, ratio of births of males to females, and ratio of deaths of Males to Females; Table showing fertility and masculinity in my Classes; Table of birth-rate and Masculinity in Scotland; Table showing ratio of Males and Females in population in different countries; Defects in general birth-rate identical with those of my Classes of Smokers.

No doubt some of my critics will maintain that I have not collected a sufficient number of cases on which to draw reliable conclusions. To those who make this objection, I reply that if I were to make use of a new drug in the treatment of any disease, and I found that the first patient to whom I gave it was distinctly worse in consequence of the drug, I should not be justified in trying the drug on other patients. If my opinions about the action of tobacco on the generative functions of both sexes were based on the histories of only ten smokers, compared with those of ten non-smokers, this objection might hold good, but I have taken the number of births among the total of 65 fathers who were non-smokers, and

108 fathers who were smokers, and I find the latter had a rate of deficiency to 1,000 fathers of 2,025 children.

I will give the details of this calculation taken from Abstracts I., II., IV. and V., Chapters XII.—XV.

SIXTY-FIVE NON-SMOKERS, CLASSES 1 AND 4 COMBINED.

Class 1.	38 fathers had	149 M. 131 F.		Children.
		280		280
Class 4.	27 fathers had	123 M. 74 F.		
		197		197
Total.	65 fathers had			477

Rate for 1,000 fathers, 7,339 children.

ONE HUNDRED AND EIGHT SMOKERS, CLASSES 2 AND 5 COMBINED.

Class 2.	57 fathers had	182 M. 209 F.		
		391		391
Class 5.	51 fathers had	70 M. 113 F.		
		183		183
Total.	108 fathers			574

Rate for 1,000 fathers, 5,314 children.

RATES COMPARED.

Non-smokers	7,339	
Smokers	5,314	
	2,025	loss to smokers.

The differences in the rates of male and female children are shown in the following Table :

Non-smokers	4,185 M.	3,154 F.
Smokers	2,333 M.	2,981 F.
Losses	1,852 M.	173 F.

Add the loss of male and female births together and it gives the total loss as 2,025 children to 1,000 smokers. This gives a rate loss of 10 M. to 1 F. among the smokers. The sex ratio for

Non-smokers is	1,327 M. to 1,000 F.
Smokers	783 M. to 1,000 F.

In the Class of smokers there was an excess of 648 female infants.

Smokers	2,981 F.
.. ..	2,333 M.
	648

In the non-smokers there was an excess of 1,031 M.

Non-smokers	4,185 M.
... ...	3,154 F.
	1,031

I maintain that these figures prove that the men in the two Classes of smokers suffered from such a loss of virile power as led to the loss of 2,025 infants to 1,000 fathers. I maintain that I am justified in attributing many cases of abortion to disease of the ovum, derived from the fertilising semen. There are different results according to strength and quantity of nicotin present in the semen. If the quantity be large, there is no fertilisation and there is absolute sterility. If the quantity be small, it may not be sufficient to prevent an ovum being fertilised, but its growth is speedily arrested, it becomes diseased and is aborted at the end of a month or two, very often at the third month. I have already shown facts in page 146 on which I base my opinion.

The rate of abortion for 1,000 wives of

Smokers was	1,035
Non-smokers	394
	641

Thus I attribute a rate of 641 abortions due to the action of tobacco. Now, if I had been content to take histories of five smokers for comparison with five histories of non-smokers, the difference in the number of abortions would not have been large enough to justify any inference as to the action of tobacco, but I have collected records of fifty-seven smokers and thirty-eight non-smokers, and I find the difference I have recorded, and I maintain that the evidence in which I form my opinion is impregnable.

I feel certain that few, if any, of the smokers knew their wives had a larger number of abortions than the wives of non-smokers, nor do I think they were conscious of suffering from comparative sterility.

These defects are very minute when they are divided among 1,000 units. The loss of 509 infants among 1,000 men in Class 2 represents a loss of one child among two men ; such a loss cannot be recognised except by collectors of statistics. In the same way, a total of 1,035 abortions to 1,000 wives looks large when announced in a book, but it only means about one abortion to each wife, while the wives of the non-smokers had an average of one abortion to three wives. These facts can only be revealed by statistics collected on an etiological basis.

I regard Class 1 as a fairly good standard, both as regards fertility and ratio of sexes, and Class 2 as abnormal, suffering from comparative sterility concerning male issue, and abnormal fertility concerning female issue and suffering from other serious defects. I know of only one agent which can produce changes of this character, viz., tobacco.

It may be an unpleasant truth to many men who have a weakness for this narcotic, but it is a fact proved by experiment by a body of men who had no intention of undergoing any medical test as to the consequences of the tobacco habit. Even now they are not aware that their wives were exposed to extra risks of abortion, or that those children who were born inherited weak or defective

constitutions in consequence of their indulgence in tobacco. I need not add they were not invited to perform experiments with tobacco, but they acquired the habit in ignorance of its evil effects.

As a student of medicine I ought to be grateful for the opportunity of making observations without the cost of performing experiments in a laboratory. Experiments performed in daily life by human beings with one particular drug, which is taken habitually during the whole period of observation, must be considered to give reliable knowledge, and to be in every way an absolute test. Whatever changes from the normal are observed among those who use the drug must be regarded as diseases resulting from its abuse.

I can now state that the loss of male infants in Class 2 equals one to every five live-born infants, and that the excess of females is equal to one to every sixteen when compared with the male and female rates in Class 1. The aggregate loss in Class 2 is one child to fourteen live-born in Class 1. This loss was entirely caused by the rates of abortions and still-births being in excess of those of Class 1 (see page 141).

Masculinity.

The proportion of males to females at birth or in a population is described as masculinity. In order to estimate the ratio of the sexes, it is usual to take 1,000 females as a base ; the number of males must be multiplied by 1,000 and divided by the number of females, the quotient is the ratio of males to 1,000 females. There is no fixed standard of masculinity, but when the ratio of males is high it is called strong ; if low it is called feeble ; if the males are fewer than the females it is called negative masculinity.* In my two Classes of non-smokers there is a high degree of masculinity, associated with a high rate of fertility, while the two Classes of smokers show negative masculinity associated with comparative sterility. The average sex ratio of the general population in England from 1901—5 was 1,037 M. to 1,000 F. This is far below the masculinity of my two Classes of non-smokers, and is much higher than the two Classes of smokers.

*See Dr. Lewis' book on "Natality and Fecundity."

Non-smokers.	Class 1...	...	1,137 M. to 1,000 F.
,,	,, 4...	...	1,662 M. to 1,000 F.
General population		...	1,037 M. to 1,000 F.
Smokers.	Class 2	...	870 M. to 1,000 F.
,,	,, 5	...	610 M. to 1,000 F.

In order to continue the comparison I will take the mean of Classes 1 and 4, also the mean of Classes 2 and 5, and compare them with the general population.

First Class.	Non-smokers	1,327 M. to 1,000 F.
Second Class.	General population	1,037 M. to 1,000 F.
Third Class.	Smokers	783 M. to 1,000 F.

This last Table represents three grades, the first is entirely free from smokers; the second contains perhaps 80 per cent. smokers among male population; the third consists entirely of smokers. The first Class has the highest fertility and masculinity, and the third Class suffers from marked sterility and low masculinity.

The general population is midway between the two extremes, and represents a mixture of smokers and non-smokers. The difference in the fertility and masculinity is an indication of the extent of the abuse of tobacco among the fathers. The first Class shows a normal masculinity: all the fathers were non-smokers. The second consists of the general population in which the proportion of non-smokers is small. The third Class consists entirely of smokers, and consequently has a lower masculinity than the second Class. The contrast in these three Classes is great. The first and third show respectively a high degree of fertility and sterility, and, behold, they show that fertility is associated with high masculinity, and that sterility is associated with low masculinity. I am therefore obliged to believe that the sterility and low masculinity are both caused by the abuse of tobacco.

It appears that masculinity began to decrease in London about the year 1701. At that time the tobacco habit had been popular for several generations.

The following Table is the earliest indication of a decrease in the natural proportion of males to females at birth. Christenings in London in the years

1664—1700 showed a ratio of 1,061 M. to 1,000 F.
1701—1725 ,, ,, 1,058 M. to 1,000 F.
1726—1750 ,, ,, 1,046 M. to 1,000 F.

(See Annual Report of Registrar General of England, 1880, page 15).

The fall in masculinity is shown in quinquennial periods for sixty-five years in Table I., and it has been falling in all those years.

Table I.

Showing Marriage Rate, Birth-rate, Births of Males to 1,000 Births of Females, Deaths of Males to 1,000 Deaths of Females. Taken from page 6 The Annual Report, 1909, of the Registrar General of England and Wales.

Period.	Persons married to 1,000 living.	Total births to 1,000 living.	Births of Males to 1,000 births of Females.	Deaths of Males to 1,000 deaths of Females.
1841-45	15·7	32·3	1052	1074
1846-50	16·5	32·8	1045	1067
1851-55	17·1	33·9	1046	1079
1856-60	16·7	34·4	1046	1079
1861-65	16·8	35·1	1043	1103
1866-70	16·4	35·3	1041	1116
1871-75	17·1	35·5	1039	1129
1876-80	15·3	35·3	1038	1133
1881-85	15·2	33·5	1038	1121
1886-90	14·7	31·4	1036	1124
1891-95	15·1	30·5	1036	1119
1896-1900	16·1	29·3	1035	1135
1901-05	15·6	28·1	1037	1142

The birth-rate began to fall in 1877, and has fallen steadily since; it reached the lowest point in 1910, 24·4.

These figures are terrible reading to all those who love their country and are able to understand the gravity of a great failure of procreative power, for unless the men of Great Britain speedily resolve to diminish their indulgence in tobacco, the race will be unfit to compete with other nations. It will be a terrible disgrace to the people of the whole Empire, unless they repent speedily of their offences

against the laws of physiology. I appeal again to the members of the medical profession, for we are specially trusted to guide the nation both by example and precept to preserve health of mind and body. There can be no national failure of generative power without an almost universal cause or causes. The falling birth-rate has been discussed by many writers in the pages of *The Lancet*, and the only causes assigned are the loss of virile men by emigration, draining the nation of her best blood; and a second cause, the use of artificial checks and marital self-denial. No doubt such influences are at work, but these are small matters compared to the annual consumption of ninety million pounds of slow poison called tobacco. If we are true to the best traditions of our profession and our King we shall make a speedy effort to warn the public and the health authorities of the far reaching evils of this habit.

I maintain that my histories and tables clearly demonstrate that an excess of female births is present in both Classes of smokers, and is associated with a marked degree of sterility, while the non-smokers show a very high ratio of males to females and a high degree of fertility; therefore it is reasonable to conclude that the defects among the smokers are the result of the abuse of tobacco.

Masculinity varies considerably in the different counties in England and Wales. The two lowest being Huntingdon 1,011 M., Merioneth 1,024 M. to 1,000 F. The highest being Radnor 1,123 M., the mean for the whole of England being 1,038.

The above were the mean rates for ten years 1899—1908. The rate for Devonshire was 1,035 M. to 1,000 F., this was slightly below the mean. I have observed that among the healthy families among smokers, both among rich and poor, there is almost invariably an excess of males. The ratio is often as high as 5 M. to 3 F. in one family; this gives a ratio of 1,666 M. to 1,000 F. If the ratio be 4 M. to 3 F., this represents a ratio of 1,333 M. to 1,000 F.

The statistics of the falling birth-rate and falling masculinity in England shown in Table I., are, in my opinion, evidence of increasing loss of procreative power amongst the men of England. It may be argued that the sterility is due to loss of reproductive power among the

women. I have failed to find any evidence to support this view.

I attribute the greater portion of the sterility in the general population to faults in the males. I base my opinion upon the clear evidence contained in the analysis of the histories of the smokers and non-smokers already given. When comparative sterility arises from what is known as "incompatibility," or marital self-denial, there is an equal loss of male and female births, but sterility caused by tobacco is associated with an excess of female births. The male issue is wanting to a larger degree than female issue. In other words, male issue is penalised to a greater extent than female issue. The excess of males at birth is shown by the ratio of males to 1,000 females.

It cannot be argued that the difference of fertility and masculinity between Class 1 and 2 is due to difference of race, or food, or climate, for both Classes consist of Devonshire working men, and yet there is a loss of fertility and masculinity among the smokers as shown below.

RATE OF 1,000 FATHERS.

Class 1.	Non-smokers	7,368 children.
Class 2.	Smokers	6,859 children.
	Loss to smokers	509
Sex ratio.	Class 1	1,137 M. to 1,000 F.
,,	,, 2	870 M. to 1,000 F.

See Chapter XII.

TABLE II.

SHOWING THAT STERILITY IS ASSOCIATED WITH LOW MASCULINITY, TAKEN FROM MY HISTORIES, CHAPTERS X.—XV.

	Children to 1,000 men.	Masculinity to 1,000 females.
Class 1, non-smokers	7,368	1,137 M.
,, 4, ,, ,,	7,296	1,662 M.
,, 2, smokers	6,859	870 M.
,, 5, ,, professional men	1,742	350 M.
Class 5, smokers, working men	6,450	767 M.

The above Table represents the fertility and masculinity rates of five classes of Englishmen. The highest fertility is Class 1, composed of working class; the lowest fertility is in Class 5, professional men, and this is associated with the lowest masculinity. I am convinced that this Class used more tobacco than any other class. It would be absurd to attribute this enormous amount of sterility to late marriages. The inequality of the sexes is characteristic of sterility caused by the abuse of tobacco.

I will now show the manner in which sterility, caused by the abuse of tobacco, effects a greater loss of males than females. The men in Class 5, had a rate of 3,588 children to 1,000 men; 1,372 M. and 2,216 F. (see page 169, note at bottom of page). The non-smokers in Class 1 had a rate of 7,368 children to 1,000 men; 3,921 M., 3,447 F. Now compare the males of the two Classes together, and also the females of one Class with that of the other.

Class 1.	3,921 M.	...	...	...	...	3,447 F.
Class 5.	1,372 M.	...	...	...	...	2,216 F.
	Loss of 2,549 M.					Loss of 1,231 F.

This Table shows that the worst Class of smokers loses 2,549 males and 1,231 females in 1,000 families. The rate of losses is 2 males to 1 female.

Class 1.	Total children	...	...	...	7,368
Class 5.	,, ,,	...	...	...	3,588
				Total loss	3,780

This loss represents a high degree of sterility in 1,000 men, owing to the abuse of tobacco. There is a loss of nearly 50 per cent. children in Class 5.

These Tables show that men who smoke to excess suffer from sterility and low masculinity. The general population contains a large proportion of smoking men, and a few smoking women, and therefore the national birth-rate and masculinity are declining as the abuse of tobacco is increasing.

The working man has the advantage of the professional man, because the former marries before his blood has become seriously affected with the poison of tobacco. This completes my inquiry into the extent of sterility and

its causes in England. I do not ignore the fact that there are many cases of sterility depending on organic disease of the sexual organs and other organs in both sexes, but beyond such few cases there is an ever increasing sterility due to the abuse of tobacco.

Table III.

Showing the decline in the Birth-rate and Masculinity in Scotland, the mean in triennial periods.

Periods.	Birth-rate.	Masculinity.
1855-57	33·1	1,053
1865-67	35·2	1,056
1876-78	35·2	1,054
1886-88	31·9	1,055
1896-98	30·1	1,046
1906-08	27·3	1,042

The birth-rate in Ireland in 1881 was 24·5 per 1,000 of population; in 1909 it was 23·5, this was the lowest birth-rate in Europe, except that of France. The masculinity in Ireland was 1044. The following are the countries which showed exceptionally low birth-rates in 1908: England and Wales 26·5, Victoria 24·6, Ontario 24·9, Belgium 24·9, and France 20·2.

Dr. Lewis calls attention to a variety of influences which affect masculinity. He shows that in Sweden it is lowest among the nobility and highest among the clergy, but offers no explanation. With regard to Scotland, the nobility and professional class had the lowest, while the commercial had the highest. He also shows that those who reside in mountainous districts have a high masculinity, *e.g.*, at 500 feet above sea-level the masculinity is 1,059; at 1,000 to 1,500 feet it is 1,073; and at 1,500 to 2,000 feet it becomes 1,078.

If mountain air can influence masculinity favourably, surely it is not illogical to attribute an unfavourable influence to the abuse of a depressing drug like tobacco? It is obvious, from my point of view, that the benefit of residing at a high altitude would be materially cancelled

by indulgence in tobacco. Many observers have tried to find a relation between the seasons of the year and masculinity, but have failed. It has, however, been proved that rural populations have higher masculinity than urban. It has also been proved that first-born children have a high masculinity, and also the offspring of mixed unions, such as marriages between Europeans and the natives of Argentine. The mean masculinity in Massachussets (1845-49) was 1,068, and in Kentucky (in 1853) 1,106. These ratios represent the offspring of mixed European races.

In estimating the birth-rates of Great Britain and other European nations, allowance must be made for the large numbers who have migrated to North and South America, Asia, Africa and Australasia. Great Britain has suffered a larger loss than other nations owing to the enormous extent of her colonial empire. India has also absorbed a large part of her population at the most fertile period. Such influences have been at work for several centuries in all countries of Europe. The returns for emigration for three months ending June 30, 1911, show that the departure of persons of British nationality exceeded the arrivals by 75,354 persons, an increase of 6·4 per cent. as compared with the corresponding period of last year. The French birth-rate received a sudden check about the year 1872 by losing the whole population of the provinces of Alsace and Lorraine, which were added to swell the German birth-rate. The loss of life in the late South African War has seriously affected the procreative power in Great Britain. While the birth-rate of France is still suffering from the loss of men killed in battle in the early part of the nineteenth century in the Napoleonic wars.

At the present time there is an enormous excess of females over males in England, as recorded in the Census, 1911, viz., 1,178,317. This large surplus of females is partly due to the more rapid decline of male births than female births. This defect has been fully shown in Table I. Other causes which contribute to the surplus are excessive mortality of males, and, to a slight degree, a larger rate of male than female emigrants.

The following Table shows the excess of females (not at birth) to a million persons of all ages. England stands highest. The Australian colonies at present have an

excess of males, but all the countries of Europe have an excess of females, except Bulgaria, which has the best birth-rate of all countries of Europe.

Table IV.

Ratio of Males to Females in 1,000,000 persons, all ages.

Census Year.		Excess of Males.	Excess of Females.
1901	England and Wales	—	32,914
,,	Scotland	—	27,860
,,	Ireland	—	13,164
,,	New South Wales	48,398	—
,,	Victoria	5,348	—
,,	Queensland	113,098	—
,,	South Australia	17,208	—
,,	West Australia	226,076	—
,,	Tasmania	39,270	—
,,	New Zealand	50,814	—
,,	Denmark	—	25,574
1900	Sweden	—	24,058
1897	Russia in Europe	—	20,802
1900	Finland	—	10,470
,,	German Empire	—	15,836
,,	Prussia	—	15,364
,,	Austria	—	17,030
,,	Hungary	—	4,688
,,	Bulgaria	19,990	—
1899	Netherlands	—	12,330
1900	Belgium	—	6,556
1901	France	—	16,046
1900	Switzerland	—	18,518
,,	Spain	—	23,970
1901	Italy	—	5,230

Every physician should seek out the causes of the declining birth-rate as his first duty. There are no medical books of the present day specially devoted to trace the influence of tobacco smoking on the generative functions ; the subject is of immense national importance, and I trust my efforts to supply the omission will bear good fruit, and awaken the conscience of the whole medical profession.

I believe that the love of narcotics is the greatest danger in civilized countries. The victory in the battle of life is won by the man with clear intellect and steady nerve: who can say how many strong and well educated men have lost intellectual and moral power through the use of tobacco?

There is a noble, unselfish crusade for every physician who wishes to fulfil his duty as a Christian medical soldier.

CHAPTER XXI.

TABLE SHOWING DECLINE OF BIRTH-RATE AND MASCUILNITY IN FRANCE; TABLES SHOWING MASCULINITY IN ILLEGITIMATE BIRTHS; TABLE SHOWING ENORMOUS EXCESS OF MALE INFANTS TO FEMALES AMONG STILL-BIRTHS IN VARIOUS CITIES AND COUNTRIES OF EUROPE; TABLE SHOWING THE RATE OF STILL-BIRTHS TO LIVE-BIRTHS.

THE French birth-rate has been steadily falling for the last hundred years; masculinity has fallen in a corresponding degree.

TABLE I.

Period.	Birth-rate per 1,000.	Masculinity.
1811-1820	31·8	1,064 M. to 1,000 F.
1821-1830	30·9	1,060 ,, ,,
1831-1840	29·0	1,060 ,, ,,
1841-1850	27·4	1,056 ,, ,,
1851-1860	26·7	1,056 ,, ,,
1861-1870	26·2	1,049 ,, ,,
1871-1880	25·4	1,047 ,, ,,
1881-1890	23·9	1,046 ,, ,,
1891-1900	22·2	1,041 ,, ,,

This Table shows that the fall in masculinity accompanied the fall in the birth-rate, it must therefore be regarded as a sign of decreasing virile power among the

men ; it should be compared with the Tables I. and III., Chapter XX. These three Tables speak for themselves; they need no comment ; they all show declining masculinity with falling birth-rates.

The following Tables show that masculinity has decreased in legitimate and illegitimate births.

TABLE II.

TAKEN FROM LEWIS' "NATALITY AND FECUNDITY."

Period.	FRANCE.		BELGIUM.	
	Legitimate Births.	Illegitimate Births.	Legitimate Births.	Illegitimate Births.
1811-1820	1,068	1,044	—	—
1821-1830	1,064	1,041	—	—
1831-1840	1,064	1,039	—	—
1841-1850	1,058	1,032	1,055	1,025
1851-1860	1,059	1,036	1,054	1,025
1861-1870	1,050	1,034	1,054	1,030
1871-1880	1,049	1,028	1,049	1,024
1881-1890	1,047	1,034	—	—
1891-1900	1,043	1,031	—	—
Average	1,055	1,035	—	—

	ENGLAND & WALES.		SCOTLAND.	
1852-1861	1,046	1,048	1,052	1,073
1862-1871	1,041	1,046	1,056	1,062
1872-1881	1,038	1,040	1,054	1,058
1882-1891	1,037	1,043	1,054	1,059
1892-1901	1,036	1,044	1,049	1,055
Average	1,039	1,044	1,053	1,061

In France and Belgium masculinity is lower among the illegitimate, but in England and Scotland it is higher. I attribute this difference to a difference in age of the fathers and to the extent to which they used tobacco. The fathers of illegitimate children in England and Scotland are

usually young men under twenty-five, and not suffering from nicotinism, while the fathers in France and Belgium were older men with more tobacco poison in their blood. I will now ask the reader to study another Table, contained in Dr. Lewis' book, which shows the ratio of males to females in live-births and still-births in various countries and cities.

TABLE III.

Place.	Observer.	Period.	Masculiuity of Still-births.	Masculinity of Live-births.
Amsterdam	Quetelet	1821-1832	1,312	1,057
Paris	,,	1823-1832	1,226	1,040
Dublin	Clarke	—	1,701	1,101
Westminster	Bland	—	1,400	1,008
Sweden & Finland	—	1755-1763	1,356	1,044
Alsace-Lorraine	Stieda	1872-1873	1,279	1,059
Italy	Bodio	1887-1891	1,311	1,058
France	,,	1887-1891	1,422	1,046
Germany	,,	1887-1891	1,283	1,052
Austria	,,	1887-1891	1,321	1,058
Hungary	,,	1887-1891	1,300	1,050
Switzerland	,,	1887-1891	1,350	1,045
Belgium	,,	1887-1891	1,321	1,045
Netherlands	,,	1887-1891	1,277	1,055
Prussia	Dusing	1872-1881	1,291	1,054
Paris	Corbaux	(8 years)	1,202	1,039
Monpellier	Mourgue	—	1,286	1,065
Sweden	Wargentin	—	1,348	1,037
Norway	Ploss	1865-1882	1,291	—
Spain	,,	1865-1870	1,503	—
European Russian	,,	1875-1878	1,282	—
Massachusetts	,,	1870-1881	1,481	—
Rhode Island	,,	1875-1883	1,595	—
Livonia	Carlberg	1873-1882	1,269	1,053

Still-born infants in France have been recorded according to their sexes, side by side with live-born children for over sixty years past. The definition of "still-born" in France includes every fœtus born dead after the fourth month of gestation. The following Table, taken from Webb's Dictionary of Statistics, shows that among the recorded still-births of different nations, there is a much larger proportion of males than among live-births.

Table IV.

Official Records.

Country.	Ratio of Male Births to 1,000 Female births.	
	Among live-births.	Among still-births.
Denmark	1,053	1,273
Norway *a*	1,060	1,262
Sweden *a*	1,057	1,277
Finland *a*	1,055	1,253
Russia in Europe *a*	1,054	1,370
Austria *a*	1,058	1,312
Hungary, Kingdom of	1,058	1,287
Switzerland *a*	1,042	1,299
German Empire	1,055	1,281
Holland	1,055	1,267
Belgium	1,047	1,302
France	1,040	1,352
Portugal *a*	1,112	1,340
Spain	1,102	1,492
Bulgaria *a*	1,079	1,349
Servia	1,057	1,323
W. Australia	1,055	1,231
Massachusetts	1,062	1,407
Japan	1,046	1,105
Italy	1,057	1,276

a The figures for these countries are based on data, relating to the period 1896-1900. In the remaining cases, the period is 1901-5. (Japan 1901-4).

The chief purpose for which I introduce Tables III. and IV., is to prove the excessive number of male infants among the still-born compared with the live-born. The statistics on Table IV. are official records, and are based on national returns of the still-born and live-born, and without exception each country has an enormous excess of males among still-born infants, and this excess is accurately represented by comparing the rate of masculinity among the live-births with that among the still-births. Now I ask why male infants are invariably penalised to such a high degree? There must be some law in pathology to account for this selective process. It cannot be explained by a theory that it is a law of nature that male fœtuses are invariably more liable to be affected by maternal

illness or influence than female fœtuses. I know of no explanation of this remarkable phenomenon, unless my histories give an explanation.

I have explained in Chapter XII. that there is no practical difference between an abortion and a still-born infant, except that the former occurs at an earlier period of life than the latter. I have clearly proved that a large number of cases of abortion were due to disease of the ovum by nicotine at the time of fertilisation. It is probable that a considerable number of fœtuses become poisoned after the fourth month, and then die from the circulation of nicotine in the maternal blood, which is absorbed by blood vessels of the placenta. In such cases we must assume that male and female infants would run equal risks, and that the greater mortality of the former is an indication of feebler vitality or less resisting power than the girls.

The evidence of the mortality Table in Chapter XII. shows that the mortality was higher among the sons of smokers than the daughters. This fact must be regarded as evidence that the male children of smokers have less resisting power than the girls, while it is also evident that boys and girls, whose parents are smokers, are less vigorous than the children of non-smokers.

There is more drinking of absinthe, and the abuse of tobacco, in the people who live in the large cities of France than among the rural population, who are arranged officially under the heading of Departments.

The rates of still-births were as follows in 1884 : in the cities there was one still-birth to every sixteen live-births ; in the Departments, there was one still-birth to every thirty-one live-births. The superior health of the rural population is shown by the smaller number of still-births, and is attributed to less abuse of tobacco and absinthe. In 1884 the rate of still-births for all France was one to twenty-nine live-born ; in 1901-5 it rose to one in twenty-two.

There are two important questions with regard to still-births. What are their chief causes ? and why do male infants invariably preponderate to a larger degree than among live-births ?

The analysis of Class 2 smokers, in Chapter XII., showed an important clinical fact, that the rate of abortions and still-births among the wives of smokers was more than twice as large as the rate among the wives of non-smokers.

RATES OF ABORTION AND STILL-BIRTHS FOR 1,000 WOMEN.

Class 2.	Wives of Smokers	1,298
Class 1.	Wives of Non-smokers	604
		694

Class 2 has an excess of 694 abortions and still-births, which are traced to the iufluence of tobacco ; thus fifty-three per cent. of the abortions (see page 143) are due to tobacco.

This excess of abortions and still-births is so large as to indicate the presence of some strong poison in the parents that has the power to destroy embryonic life. This effect has been rightly attributed to tobacco. I am by no means the only observer to regard tobacco as an abortifacient. I have recorded observations made by other medical men which support my views. Having proved that tobacco was the cause of over 53 per cent. of the abortions and still-births in Class 2, I may assume that similar causes will produce similar results in other countries.

If we allow for the difference between the general population, which contains a few non-smokers, and Class 2, which consists entirely of smokers, we may estimate that the proportion of still-births, directly due to the abuse of tobacco, cannot be much lower than 50 per cent. of all still-births in the general population. My critics may assert that Class 2 is not a fair sample of the general population, but this objection will not hold good, for the rate of fertility is rather above the average of the general population, and every man in the series was a fair specimen of a self-dependent citizen, maintaining himself and his home by honest toil, and acting in a rational way except with regard to the use of tobacco—in this respect he was an offender against the laws of hygiene.

I think that the inhalation of tobacco smoke by pregnant mothers when sitting among smokers is sufficient to cause fatal poisoning of the fœtus. It has been proved that

women who work in tobacco factories are specially prone to abortion.

The following Table shows the frequency of still-births.

COUNTRIES ARRANGED IN NUMERICAL ORDER, SHOWING THE MEAN ANNUAL RATES OF STILL-BIRTHS IN THE PERIODS 1901-5, PER 1,000 TOTAL BIRTHS (LEGITIMATE AND ILLEGITIMATE.*

State.	Still-births per 1,000 total births. 1901-1905.	State.	Still-births per 1,000 total births. 1901-1905.
France	45·2	Bavaria	28·8
Maine, U.S.A.	44·2	W. Australia	27·5
Vermont U.S.A.	43·5	Austria	26·5
Belgium	43·5	Baden	26·1
Italy	42·9	Sweden	25·1
Holland	40·8	Finland	25·1
Massachusetts	35·7	Spain	24·9
Switzerland	34·8	Norway	24·1
Saxony	33·9	Denmark	23·7
Argentine Republic	31·7	Servia	21·4
Uruguay	31·3	Hungary, Kingdom of	20·0
Prussia	30·8	Roumania	19·3
German Empire	30·7	Portugal	14·6
Wurtemburg	30·2	Bulgaria	5·7
		Great Britain, not recorded	

Those countries which have rates of still-births, under 30 per 1,000, are chiefly agricultural. The inhabitants are mostly thrifty and industrious peasants. The countries with the higher rates are manufacturing countries, and the people are richer. The former class smoke less than the latter, for it is known that the richer people are, the more tobacco they use. I will venture to state that those countries which use most tobacco have the largest number of still-births.

* From Webb's "Dictionary of Statistics."

CHAPTER XXII.

The Aim of Hygiene; The ancient office of Physicians; The Oath of Hippocrates: The narcotic slumbers of the British Medical Association disturbed by the National Insurance Bill; The Baptismal Vow of the Christian.

Hygiene is the classical term for what we call health. The word has been enshrined in the hearts and minds of earnest physicians ever since the time of Hippocrates. I confess I am an enthusiast in the cause of health. It is the best of God's material blessings and should be valued accordingly. To all those who value health at its true estimate, the office of a physician will rank as holy. This was the view taken by the learned Jew, who wrote the book of Ecclesiasticus, now one of the books of the Apocrypha.

"Honour a physician with the honour due unto him for the use which ye may have of him: for the Lord hath created him.

"For of the Most High cometh healing, and he shall receive honour of the King.

"The skill of the physician shall lift up his head: and in the sight of great men he shall be in admiration.

"The wisdom of a learned man cometh by opportunity of leisure: and he that hath little business (that is, much leisure) shall become wise.

"How can he get wisdom that holdeth the plough, and that glorieth in the goad that driveth oxen, and is occupied in their labours, and whose talk is of bullocks?

"He giveth his mind to make furrows; and is diligent to give the kine fodder. So every carpenter and work-master that laboureth night and day; and they that cut and grave seals, and are diligent to make great variety, and give themselves to counterfeit imagery, and watch to finish a work.

"They shall not be sought for in public counsel, nor sit high in the congregation; they shall not sit on the judge's seat, nor understand the sentence of judgment; they cannot declare justice and judgment." (Chapter xxxviii.)

Hippocrates was the most famous of the early physicians. He was born 460 years before the founder of the Christian religion; he was the grandson of Nebrus, a celebrated physician; he devoted all his time for the service of his country; he delivered Athens from a dreadful pestilence, and was publicly rewarded with a golden crown, etc. "He knew how to moderate his own life, as well as to prescribe to others." He died in the 99th year of his age, free from all disorders of the mind and body. His memory is still venerated at Cos. He became the founder of a celebrated school of physicians who followed his example, and took the oath which he required. These physicians formed a medical body of priests, and they regarded their founder with the greatest reverence. We may regard the famous Hippocratic Oath as evidence that those early physicians were profoundly religious. Religion was the foundation of their art, and they were not ashamed to speak of their faith in the Unseen Gods they worshipped. When a new member was admitted into the craft, he was obliged to take a solemn oath, of which the following is a copy:

The Hippocratic Oath.

"I swear by Apollo, the physician, and Æsculapius, and Hygeia (Health), and Panaceia (All heal), and all the gods and goddesses, calling them to witness that I will fulfil, according to the best of my power and judgment, this oath and written bond.

"To honour as my parent, the Master who has taught me this art, and to share my substance with him, and to minister to all his necessities; to consider his children as my own brothers, and to teach them this art, should

they desire to follow it, without remuneration and without bond; to admit to my lessons, my discourses, and all my teaching, my own sons and those of my tutors, and those who have been inscribed as pupils, and who have taken the medical oath, but no one else.

"*I will prescribe such regimen as may be for the benefit of my patients, according to the best of my power and judgment, and preserve them from anything hurtful and mischievous.* I will never, if asked, administer poison, nor be the author of such advice. Neither will I give to a woman a pessary to procure abortion.

"I will maintain the purity and integrity both of my conduct and my art.

"I will not cut any one for stone, but leave the operation to those who cultivate it.

"Into whatever dwellings I may go, I will enter them for the benefit of the sick, abstaining from all mischief and corruption, especially from any immodest action towards women or men, free-men or slaves. If during my attendance, or even unprofessionally in common life, I should hear or see anything which should not be revealed, I will consider it a secret, not to be divulged. May I, if I observe this oath and do not break it, enjoy good success in life, and in the practice of my art, and be esteemed for ever. Should I transgress and become a perjurer, may the reverse be my lot."

Owing to the commercial spirit which has gained ascendancy in modern times, we are unable to fulfil those clauses of the oath that relate to free medical education, but some of the other clauses are obligatory in our own day. In our own day we attempt to prescribe such regimen as may be for the good of the patient and to preserve him or warn him from anything hurtful and mischievous. May I ask if it is the custom of all medical men to warn their patients about the poisonous nature of tobacco? Secondly, are all medical men careful to maintain the purity and integrity of their conduct and art by setting an example of a good and natural life? Therapeutists, physiologists, and a number of medical men have testified to the fact that tobacco-smoking is injurious both to mind and body, and yet we

see a number of medical men treating the question with indifference, and even encouraging the contrary belief both by example and precept.

The moral tone of this professional pledge is worthy of imitation in our own day. We may feel certain that Hippocrates was an enthusiast in the cause of hygiene, and that he endeavoured at all times, and in all company, to be pure and true in thought, word and deed. We may be sure that he lived a natural and simple life, and avoided all forms of excess in eating and drinking. We may also be sure he did not indulge in narcotic drugs, such as tobacco, morphia, etc. When we read the words of this oath, we feel that God had bestowed His Spirit upon these physicians as a reward for their devotion to the Unseen God, whom they loved and feared. God lifted the darkness of ages from their minds, and revealed His will, and they were faithful and obedient. They were held in honour by all men, who recognized their wisdom and power of healing. We have a Master to honour and obey who is supreme, and who spoke of Himself as "The Light of the World," "The Saviour of Men," "The Great Physician."

We have a Master to obey and honour, who was unknown to Hippocrates. In this respect our privileges are immensely greater than those of Hippocrates, but these privileges carry immense responsibilities.

We profess to be servants of Christ and to minister to the sick in His name. Are we fulfilling our profession? We like to speak of our profession as being noble and honourable, and so it is to a large extent, but there is a sad omission, a general dislike to speak the truth about the evil effects of tobacco. In the year 1907 I appealed to the British Medical Association to appoint lecturers in our large towns to teach the public the evil effects of tobacco, and I suggested that this subject should be included in the curriculum in all medical schools. I also appealed for the appointment of a committee to collect information regarding diseases caused by tobacco. My efforts were futile.

I maintain that the evils of tobacco is a subject which ought to be warmly taken up by the Association, for the third article of the Association states:

"The objects for which the Association is established

are the promotion of the medical and allied sciences, and the maintenance of the *honour* and the interests of the medical profession," etc., etc.

I consider the attitude of the Association towards the abuse of tobacco is most inconsistent and indefensible. Although one of its objects is to promote medical science, it declined to take any steps to investigate the nature of the various diseases caused by tobacco. I am convinced that the extent of the diseases resulting from the habit is not yet known, because medical men will not undertake their systematic investigation. They are deceiving themselves and the public. Such conduct is not worthy of men of science, and is neither noble nor honourable. Because unlearned people are deceived into the belief that tobacco is beneficial in some way, because so many doctors and clergy, and other people of rank and influence adopt the habit. The Association has immense power in the British Empire, and being a voluntary Association, and not throttled with red tape, it could go anywhere and teach the truth without let or hindrance. I hope it will soon do the right thing, and set its house in order, and then begin a reform outside. I am glad to state that the President of the Association, at the last Annual Meeting at Birmingham, had the courage to say a few warning words about the habit.

We, as a profession, have a great responsibility in this matter. The health of the people of the Empire is in our hands, and we ought to urge our patients to avoid tobacco entirely, as it is a depressing narcotic, with injurious effects on every tissue in the body, and especially on the blood. I am surprised the Association is still indifferent to this question. How differently it acted when the pecuniary interests of medical men were threatened with danger by the National Insurance Bill.

The Association became very active at once, and all the members signed petitions protesting against the objectionable clauses of the bill. I am sorry to bring this accusation against the British Medical Association, that it was indifferent to the health of the nation, so far as the evils of tobacco are concerned (and also indifferent to the health of its own members), while it became active, directly the pecuniary interests of the profession were concerned.

Such an Association has practically sunk to the level of a Trades Union, and a very unsuccessful one at the best. I have lived long enough to find that the world is full of false teachers and prophets, while there are still many faithful servants of Christ among all classes, rich and poor, learned and unlearned. In my opinion the greatest asset the world possesses is the Gospel of Jesus Christ. That is the most valuable medicine the world possesses. The world used to get on well before surgery and medicine became fine arts. They are useful arts, but are not essential. They cannot remove disease and death. These are the end of all men.

But the end of those who are faithful to Christ is

"A crown of everlasting life."

I believe it would be a great help to every Christian man and woman to repeat the words of the Baptismal Vow every day, "I renounce the devil and all his works, the vain pomp and glory of the world, with all covetous desires of the same, and the carnal desires of the flesh; I will not follow them; I make this promise in the name of the Father, the Son, and the Holy Spirit" (see Book of Common Prayer).

Final appeal to the Reader.

I am conscious that my book is full of repetition. And, worse still, I have not completed the task I set myself, I have not yet described *half* of the diseases caused by tobacco, I have not exhausted the subject, but I have exhausted my strength; I trust God will raise up some man better qualified than myself to finish the task. I have not had time to tackle the painful problems how far tobacco is responsible for the vast numbers of mal-formed atrophied infants which are born into the world, suffering from incurable diseases; some of these die as infants and others survive, only to grow up into suffering and deformed men and women. Nor have I had time to deal with the ever increasing nervous disorders often ending in lunacy; nor have I dealt with suicides or explained why suicides are more common among men than women, the proportion of men being three to one woman. Nor have I had time to explain the

connection which exists between tobacco and cancer. I pray that God will spare me the task of doing all this; but if He ordains I should finish the work I have begun, I will obey and trust to Him to give me necessary strength and wisdom.

"The time has come for me to rise,
And chase the *slumber* from mine eyes,
To hail the East, and greet the West,
And say to God, 'I'll do my best.'

"The time has come for me to rise,
In duty every pleasure lies,
And so with courage, faith and zest,
I'll face the world and do my best."

ERRATA

Page 10, line 33, for *tubercule* read *tubercle.*

„ 21 „ 22 „ *salvation* „ *salivation.*

„ 69 „ 8 „ *aggregate* „ *average.*

„ 170 „ 6 „ *these two tables* read *Class 5 suffers from two serious defects.*

„ 170 „ 34 „ *1,372 F.* read *1,372 M.*

„ 174 „ 4 „ *474* „ *473.*

„ 180 „ 4 „ *natural* „ *maternal.*

„ 181 „ 5 „ *amniotic* „ *amnionic.*

„ 202 „ 37 „ *Table VI., Chapter XIX.* read *Table I., Chapter XX.*

„ 237 „ 29 „ *1884* read *1844.*

„ 177 „ 32 „ *abortions* read *fœtal losses.*

„ 177 „ 36 „ *better and should have a lower rate,* read *the latter must therefore have a higher proportion of smokers, and consequently have a higher rate of abortions, perhaps 1 to 6.*

TO SUPERSEDE TABLE AT FOOT OF PAGE 179.

Estimates of the number of fœtal deaths (abortions and still-births) in each part of the United Kingdom in 1909, based on Dr. Jewett's estimate of 1 fœtal death to every 6 live-born infants in general population. These estimates are prepared for comparison with estimates among non-smokers, among whom, in Class 1, the rate of fœtal deaths was 1 to every 12 live-born infants (see page 179).

Total births for England and Wales	914,472
,, Scotland	128,582
,, Ireland	102,759
Fœtal losses in	
England at rate of 1 to 6...	152,412
,, ,, 1 to 12	76,206
Excess to smokers	76,206
Scotland at rate of 1 to 6...	21,430
,, ,, 1 to 12	10,715
Excess to smokers	10,715
Ireland at rate of 1 to 6	17,126
,, ,, 1 to 12	8,563
Excess to smokers	8,563
Total excess to smokers	95,484

In order to understand the causes of the diseases which afflict the nation, it is necessary to understand the pathology of alcoholism and nicotinism. This inquiry does not include diseases caused by the abuse of alcohol. The author claims to have proved that one of the effects of the consumption of ninety million pounds of tobacco year by year is the annual loss of 95,484 fœtal lives.

Can the British Medical Association still remain indifferent to the evil effects of tobacco? Does it approve of this enormous loss of fœtal life year by year? Then I appeal to the Members of the Association to use their political and professional influence to try and check such a terrible waste of human life, by teaching the laws of hygiene to all classes.

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