

# **The History of Medicine**

**A Beginner's Guide**

Mark Jackson



O N E W O R L D

A Oneworld Paperback

Published in North America, Great Britain & Australia  
by Oneworld Publications, 2014

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A CIP record for this title is available  
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ISBN 978-1-78074-520-6  
eISBN 978-1-78074-527-5

Typeset by Siliconchips Services Ltd, UK  
Printed and bound in Denmark  
by Nørhaven

Oneworld Publications  
10 Bloomsbury Street  
London WC1B 3SR  
England

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For Ciara, Riordan and Conall

*'A heart is what a heart can do.'*

Sir James Mackenzie, 1910



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# Preface

Writing this book has provided me with an opportunity to indulge two complementary aspects of my constitution: a passion for science and medicine on the one hand, and a commitment to history and the humanities on the other. Many years ago, in an earlier and more troubled life, I qualified in, and for a brief period practised, medicine. Although the problems of pathology and the challenges of clinical medicine held, and continue to hold, an enduring appeal, I found it increasingly difficult to cope at the time with the psychological and physical demands of the clinic and became frustrated by the narrow conceptual horizons of modern medical education, research and practice. After completing a doctoral dissertation on the history of legal medicine, a new pathway opened up for me as I began to explore, from a historical perspective, the social, cultural and political determinants of both medical knowledge and personal experiences of health and illness. This choice of career was fortuitous. A life in academia has allowed me to reconcile contradictory facets of my intellectual interests, to manage the vagaries of my personality as well as fluctuations in mood and energy, to engage constructively with colleagues and students, and to share more equally the pleasures and demands of marriage and parenthood with Siobhán.

My transition from dispirited physician to aspiring historian of medicine has been facilitated by numerous friends and colleagues. In particular, I have been encouraged and stimulated by the work of Roberta Bivins, Bill Bynum, Mike Depledge, Paul Dieppe, Chris Gill, Rhodri Hayward, Ludmilla Jordanova, Staffan Müller-Wille, John Pickstone, Roy Porter, Ed Ramsden, Matt Smith, Ed Watkins, John Wilkins and Allan Young, and by

the continued support of postgraduate students, post-doctoral fellows and administrative staff in the Centre for Medical History, especially Fred Cooper, Barbara Douglas, Claire Keyte, John Ford, Jana Funke, Ali Hagggett, Sarah Hayes, Grace Leggett, Kayleigh Nias, Debbie Palmer, Lyndy Pooley, Pam Richardson and Leah Songhurst. I am grateful to Steve Smith, Nick Talbot, Nick Kaye and Andrew Thorpe at the University of Exeter for their willingness to endorse my research initiatives. More directly, the form and content of this book have been strongly informed by lectures and seminars delivered to undergraduate and postgraduate students at Manchester and Exeter, and by various opportunities to teach GCSE and A level students at Colyton Grammar School and other local schools and colleges. I am grateful to all those students for listening, arguing, and sometimes agreeing.

Of course, none of these research and teaching activities would be possible without the enlightened support of the Wellcome Trust, which has been instrumental in shaping not only the emergence of the history of medicine in recent decades but also the growth of medical humanities. The Trust's commitment to rendering historical research instrumental in the pursuit of better health has generated opportunities for greater, and more meaningful, exchange between science and the humanities and helped to sustain my dream of uniting disparate aspects of the practice of medicine. I am also grateful to Wellcome Images for providing, and allowing me to reproduce, the illustrations and to Caroline Morley and Miriam Ward for their assistance. I am greatly indebted to Fiona Slater of Oneworld, who first suggested that I write a book of this nature on this topic. Fiona's vision and advice have been crucial both to the initial formulation and the eventual realization of the work. I would also like to thank Ann Grand for her meticulous copy-editing and David Inglesfield and Linda Smith for their careful proof-reading.

Although Siobhán will forever be my muse in all spheres of life, it is our children who especially challenge my inherent tendency to solipsism and misanthropy. While they undoubtedly

share my genetic constitution, they display their own idiosyncratic intelligence, temperament and sensitivity in a way that forces me to view the world with fresh and, I hope, more considerate eyes. This book is written for Ciara, Riordan and Conall, who remind me regularly of the heart's capacity to adapt to new demands.

# Introduction

‘By the historical method alone can many problems in medicine be approached profitably?’

William Osler, *Aequanimitas*, 1928

Medicine touches us all at some stage in our lives. Whether we live in a crowded high-tech westernized society that uses the diagnostic and therapeutic tools of modern bioscience or in an isolated rural community where health care is perhaps less formal, less intrusive and less commercial, it is arguably medicine, rather than religion or law, that dictates the manner in which we are born, the quality of our lives, and the ease and speed of our deaths. Indeed, although modern populations are increasingly struggling to cope with chronic conditions such as cancer, heart disease, arthritis, obesity and depression, we have come to rely heavily on the ability of medicine to help us live relatively happily, healthily and productively well into our eighties.

Given the extent to which it penetrates the physical, psychological and even spiritual dimensions of human existence, it is no surprise that medicine constitutes a vast territory. In the early twenty-first century, the practice of medicine incorporates, among other things, the preservation of health and the prevention of illness, the discovery and application of pharmacological tools to combat mental and physical disease, the development of novel diagnostic and surgical techniques to identify and remove tumours, heal broken bones or restore blood-flow to ailing hearts, the formulation of policies designed to protect national and global public health, the use of psychotherapy to reduce

depression and anxiety and to promote happiness, the delivery of welfare services and medical support to mothers and their children, and the alleviation of pain and disability.

In the past, the contours of medicine have been even more expansive. In both Eastern and Western cultures, medicine has embraced religion, magic, alchemy and astrology, as well as the application of herbal remedies, the use of healing rituals, sacrifices and offerings to the gods, and the relief of poverty. Health care has been dispensed not only in specialist institutions, including hospitals, workhouses, monasteries and hospices, but also regularly in the community, on the battlefield and at home. Within these diverse environments, advice and treatment were delivered by a range of practitioners often trained in quite different ways and possessing different, although usually complementary, skills and knowledge. In sickness and in health, patients sought the services of shamans, diviners, priests, midwives, nurses, physicians, surgeons, apothecaries, and a miscellany of itinerant practitioners, charlatans and quacks. Historically, medicine has never constituted a monolithic system of knowledge and practice but has always been marked by a vibrant sense of diversity and pluralism.

The task of unravelling the history of medicine is further complicated by the fact that medical theory and practice, as well as the distribution and patterns of disease, have been so deeply embedded in social contexts that the boundary between medicine and society has been indiscernible. In all ages and all cultures, the appearance, spread and control of both infectious and non-infectious diseases have been dictated by social, economic and cultural factors. At the same time, the practice of medicine has been a social endeavour, not only reflecting the norms and expectations of patients and politicians alike but also influencing the beliefs, customs and hopes of the sick, the healthy and their healers. Even in the modern era of biomedicine, when science appears to offer a more objective perspective on health and illness, scientific knowledge, clinical practice and health-care

policies continue to be determined by social and cultural factors as well as economic and political expediency.

There has been a tendency in recent times to distinguish rather deliberately between science and the humanities, as if they possess entirely different agendas and methods or constitute entirely different intellectual cultures. While science and medicine appear to offer more reliable accounts of the natural world and its problems, the humanities seem to deal only with subjective, and often unverifiable, aspects of personal and public life. As a result, historical, philosophical or literary studies of medicine and science have often been divorced from the pursuit of clinical knowledge, improved health policies and better treatments. For a number of reasons it is a mistake to impose a distinction between medicine and history in this way. In the first instance, the notion of history has always been integral to clinical method. From ancient to modern medicine, students have been taught to consider the patient's history from various perspectives: the history of current symptoms; the patient's past medical, occupational and social history; and the family (and increasingly this means genetic) history. Personal and biological, as well as collective and psychosocial, histories have thus been central to the processes of accurately diagnosing disease and formulating appropriate treatments and policies. Second, as both historians and doctors have pointed out, history also constitutes a vehicle for educating, inspiring and humanizing medical and nursing students who might otherwise succumb to the brutalizing effects of regular exposure to disease and death.

Perhaps more contentiously, research in the medical humanities allows us to recognize the power and limits of medicine and to acknowledge the cultural, social and political, rather than merely technical, obstacles to health promotion and disease prevention. By exploring the human aspects of medicine and tracing the development of medical theories, policies and institutions across time, medical history can reveal the manner in which medicine

reflects and shapes far wider historical currents and the extent to which experiences of health and disease structure our lives. More broadly, while science can uncover many of the mechanisms underlying patterns of health and disease, it is the humanities that can more effectively reveal the meanings of our experiences of pain and suffering. Medical history and the wider humanities, like the biomedical sciences, should therefore be integral to our search for health and happiness.

Historians have approached the history of medicine in different ways. Some scholars have focused on narrating and celebrating great discoveries made by pioneers in the field or on the health and illnesses of key historical figures. In these stories of progressive innovation, the achievements of Hippocrates, Galen, Ibn Sīnā, Ambroise Paré, Andreas Vesalius, William Harvey, Edward Jenner, John Snow, Ignaz Semmelweis, Florence Nightingale, Joseph Lister, Louis Pasteur, Robert Koch, Alexander Fleming and many others have taken centre stage. Such tales of success are not without merit: they highlight the extraordinary contributions of doctors to the history of humankind and bring the drama and significance of medicine to the fore. At the same time, however, they often give precedence to the accomplishments of men over women, the traditions of the West over the East, and the importance of biological and technological, rather than social and cultural, factors.

By contrast, social historians have recently moved away from telling stories of triumphal progress towards an approach that emphasizes the historical contingency of medical knowledge and the cultural specificity of experiences of health and illness. In these histories, there is no fundamental or enduring truth waiting to be unearthed by enlightened scientists and doctors; rather, knowledge and practice are regarded as always shifting, and contested, products of socio-cultural and political forces. While such accounts of medicine and disease in the past effectively reveal the social determinants of health and healing, they

tend to lose the sense of theatre and urgency embedded in the practice of medicine and to ignore the extent to which both past and present populations have routinely depended on medicine to forge a better world.

In many ways, this book is an attempt to establish a middle way between these distinctive, and sometimes competing, formulations of medical history. Given that the past is unknowable, or at least inaccessible to direct perception, any account of the history of medicine is dependent on the precise perspective from which it is written and on the selection and analysis of particular sources. Coloured by my training as a doctor and my life as an historian, the following chapters are predicated on a belief that medical history and biomedical science are complementary tools in our attempts to engineer significant improvements in the health of human populations. History not only reveals elements of continuity and change in medical theory and practice but also exposes the close relationship between personal experiences of illness, scientific knowledge of bodies and minds, and the broader social factors that influence our understandings of health and disease. In addition, historical research clearly demonstrates shifting attitudes to the complex interactions among patients, doctors and disease. Given the vast geographical and chronological range encompassed by the term 'medical history', the narrative is necessarily determined by my idiosyncratic intellectual and clinical interests. Nevertheless, I have attempted to incorporate Eastern, as well as Western, medical traditions, to trace the distinctions between alternative and orthodox practices, and to explore the similarities and contradictions between lay and expert knowledge. My aim is to reveal the manner in which the boundaries between health and disease, between science and the humanities, and between the past and the present are less secure than we often imagine.



# 1

## Balance and flow: the ancient world

The woman who lodged at the house of Tisamenas had a troublesome attack of iliac passion, much vomiting; could not keep her drink; pains about the hypochondria, and pains also in the lower part of the belly; constant tormina; not thirsty; became hot; extremities cold throughout, with nausea and insomnolency; urine scanty and thin; dejections undigested, thin, scanty. Nothing could do her any good. She died.

Hippocrates, *Of the Epidemics*

It is the fifth century BCE. A young man from the coastal city of Abdera is being examined by Hippocrates, the most famous physician in Greece. For several days, the patient has been suffering from an acute fever accompanied by pain in his right side, a dry cough, thirst and increasing delirium. Having failed to relieve the pain and cough with warm applications, on the eighth day Hippocrates opens a vein at the elbow to release blood. This treatment seemed to promote recovery. According to Hippocrates' subsequent report of the case in his extensive work on epidemics, the patient's pains, fever and thirst diminished, he began to cough up sputum, and his breathing eased. Unlike many less fortunate patients in the ancient world, by the thirty-fourth day of his illness the young man was fully restored to health.

## 2 The History of Medicine: A Beginner's Guide

Historians have often regarded the Greek physician Hippocrates (c. 460–371 BCE) as the father of medicine. There is some truth to this claim. Hippocrates and his students laid the foundations of an approach to medicine in the Western world that lasted over 2,000 years. As the case of the young man from Abdera demonstrates, the works attributed to Hippocrates provided early descriptions of many diseases and injuries, including epilepsy, epidemics, ulcers and fractures, and established a range of preventative and therapeutic interventions, including herbal remedies, surgery, bleeding and dietary recommendations. In addition, they explored the impact of environmental conditions on health and provided a framework for professional ethics encapsulated in the Hippocratic Oath, which in many countries remains a key feature of the process of induction into the medical profession.

The pivotal place of Hippocrates at the origins of medicine can, however, be challenged. Many of the books attributed to Hippocrates, referred to as the Hippocratic Corpus, were not written by him. In addition, there was no single Hippocratic system even in the ancient West: Hippocratic theories were contested and shifted over time in much the same way that medicine has evolved and been challenged in the modern world. Finally, and perhaps most importantly, there were earlier formulations of diseases and their treatments in the ancient Eastern cultures of China, India and Egypt that arguably had a longer-lasting influence on the practice of medicine than those of Hippocrates. Indeed, these overlapping Eastern traditions may well have informed Hippocratic medicine, which can be regarded in some ways as derivative rather than entirely original.

It is difficult to reconstruct ancient medical theories and practice with any certainty. Textual sources are often fragmentary, difficult to decipher or available only in translation, and bio-archaeological evidence is open to interpretation. In spite of these challenges, the sources suggest that, although there were differences in the manner in which ancient cultures understood,

experienced and treated disease, there were also common elements in Chinese, Indian, Egyptian and Graeco-Roman medicine. Most ancient medical systems around the world explained disease in terms of the impact of constitution, lifestyle and environment on the balance and flow of humours or energy through designated channels in the body. Ancient approaches to the prevention and treatment of ill-health were also similar, focusing on the application of herbs, the restoration of humoral balance, the occasional use of surgery, and appeals to the benevolence of supernatural forces. To understand the emergence and development of these diverse, but overlapping, medical traditions we need to consider three broad questions. Which diseases did ancient populations live with and die from? How did patients and their doctors or healers explain and experience health and illness? And how did ancient doctors in the East and West attempt to prevent and treat disease?

## Yin and yang

The origins of Chinese medicine are shrouded in myth. The key ancient Chinese medical texts are attributed to two legendary sages from the third millennium BCE, Huangdi, the Yellow Emperor, and Shennong, also known as the Divine Farmer or Red Emperor. Based on oral traditions, the works of these ruling sages were not formalized in written texts until the Han dynasty, between 206 BCE and 220 CE. While Huangdi's *Classic of Internal Medicine* (or *Neijing*), written in the form of a conversation between the Emperor and his physician, constituted an account of the principal causes and symptoms of disease, Shennong's *Materia Medica* (or *Pen-ts'ao ching*) provided an extensive treatise on the classification and therapeutic use of food and drugs.

These canonical texts suggest that the ancient Chinese suffered from a similar range of acute and chronic diseases to many modern populations, although they were usually described

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broadly in terms of symptoms or altered function, rather than in terms of separate disease categories. Epidemics of fevers or infectious diseases were common, as were diseases of the heart, lungs, eyes, stomach and liver, and illnesses attributed to emotional or psychological disturbances such as insanity, anger, numbness and loss of speech. For example, the condition of laboured breathing, which became known in the West as asthma, was recognized in early Chinese texts. However, in contrast to modern Western medicine, such conditions were regarded as the product of systemic alterations throughout the body, not merely as the result of damage to specific organs.

Chinese medical theories of health and disease focused on the flow of *Qi* (usually translated as force or energy) around the body through designated channels (*mai*) and on the balance between the complementary properties of *yin* and *yang*. Well-being was a state in which the flow of *Qi* was uninterrupted and there was an appropriate state of equilibrium between *yin* and *yang*. Disease was the result of disturbances in the flow of *Qi* and imbalances between the quality and quantity of *yin* and *yang*, generated for example by over-indulgence. The properties of *yin* and *yang* did not correspond with particular components of the body but, rather, represented alternative aspects of bodies and the universe: *yin*, the female element, signified darkness, dampness, cold, the moon and death; by contrast, the male element, *yang*, symbolized the sun, heaven, light, heat and life. An appropriate mixture of *yin* and *yang* was essential for human health, political stability and the harmony of the cosmos. Within this comprehensive scheme for explaining life and death, which owed much to the ancient philosophical concept of *tao* ('the way'), the body not only constituted a microcosm of creation but was also considered analogous to the organization of the empire: bodies, like countries, were run by rulers (comparable to the 'heart-mind'), state officials (the lungs) and others (the liver, kidneys, spleen and intestine) working together to ensure peace and stability.

Ancient Chinese medicine comprised an amalgam of anatomical and physiological understandings of the body and a belief in both harmful and healing spirits. Chinese doctors included shamans and diviners (known as *wu*), priests (or *chu*), practitioners of demonic medicine and a variety of less respected itinerant practitioners and female healers. The role of healers was to diagnose disease, predict the outcome of disorders and provide effective treatment. Diagnosis was based primarily on examining the pulse at various locations on the surface of the body, as well as observing skin colour, emotional state, the pattern of breathing, and the condition of the tongue and sensory organs. The quality of the pulse, which remains a major concern of traditional Chinese medicine in the modern world, was particularly important, since it revealed the flow of *Qi* through the body. Accurate prognosis of the outcome of disease depended not only on close examination of the body but also on recognizing the impact of environmental conditions on the appearance and symptoms of disease, on medical divination and numerology, and on understanding the relationship between the state of the body and the cycles of nature.

Treatment involved restoring the flow of *Qi* and re-establishing the balance of *yin* and *yang* to release energy. A variety of

### HEALTHY PULSE, HEALTHY HEART

According to the Yellow Emperor's physician, Ch'i Po, health and sickness could be determined by feeling the pulse:

'When man is serene and healthy the pulse of the heart flows and connects, just as pearls are joined together or like a string of red jade – then one can speak of a healthy heart.

'When man is sick the pulse of his heart rushes and pants. When this panting is continuous and springs from within and the pulse beats are wrong and small – then one can speak of a sick heart.'

Huangdi's *Classic of Internal Medicine*, third millennium BCE

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Figure 1 Chinese acupuncture chart (Wellcome Library, London)

approaches was adopted by ancient Chinese healers. The most important technique was acupuncture, which involved the insertion of fine needles into designated points on the body to encourage the unimpeded flow of Qi. Most medical texts contained diagrams depicting the appropriate acupuncture points used to treat particular conditions (see Figure 1). An alternative to acupuncture was moxibustion, in which preparations of *moxa* (mugwort) were burnt at key points on the skin to unblock the

obstructed flow of *Qi*, particularly in chronic conditions. Such approaches to preserving or restoring the flow of blood and *Qi* through the bodily channels remained pivotal not only to the practice of modern Chinese medicine in the East but also to the subsequent adoption of Chinese techniques in many Western countries.

Classical Chinese medical texts reveal other forms of treatment. Although neither surgery nor anatomical dissection was used, except for the occasional treatment of injuries and abscesses, blood-letting was employed to restore balance and flow. Drugs derived from animals, vegetables and minerals, taken in pills, powders and syrups, also constituted important tools in the attempt to prevent and cure disease. Therapeutic minerals, which were produced and administered according to alchemical principles and valued according to their rarity, included gold, lead, mercury, arsenic and cinnabar. Herbs were classified according to their colour, aroma and taste, and usually mixed to produce therapeutic ‘decoctions’. As in many other ancient cultures, plant and animal substances were sometimes prescribed according to the principle of correspondence; that is, according to the belief that the healing properties of a substance were related to its resemblance to an organ or attribute of the body or to the symptoms of a specific disease. Tiger-bone or rhinoceros horns, for example, were thought to impart strength. Some traditional Chinese medicines form the basis of modern drugs: *ma huang* (ephedra) was prescribed by ancient Chinese doctors to relieve breathing difficulties; in the form of ephedrine this is still used in the twenty-first century to relieve hay fever and acute attacks of asthma.

Existing alongside these pharmacological approaches were more gentle treatments such as massage, exercise and dietary supplements. In addition, many practitioners and their patients endorsed spiritual approaches to health and illness, informed initially by Daoism and later by Buddhism. The practice of

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*dao yin*, which was perhaps similar to yoga or gymnastics, used a combination of breathing exercises, physical movement and introspection to purify the body and restore vitality. Religion provided a sense of continuity and structure to the practice of Chinese medicine, in spite of the fact that doctors and their patients were increasingly adopting more secular understandings of health and disease. Ritual, worship, confession, meditation and sacrificial offerings were routinely used, particularly by the lower social classes, to prevent and treat diseases thought to be caused either by sin or by demons and evil spirits.

It is important to recognize that ancient Chinese medicine was neither singular nor static, as some historians and practitioners have assumed. Although the works of Huangdi and Shen-nung remained central to the practice of medicine, particularly amongst elite physicians, their descriptions and prescriptions were adapted by later writers such as Zhang Zhongjing (second to third century CE), whose account of fevers was for many centuries employed by governments attempting to prevent and combat fatal epidemics. In some parts of China, it was the Tibetan 'science of healing' (*sowa rigpa*), with its mix of humoral theory and a belief in spirits and the protective value of mantra, exorcism and ritual, that became the most common form of medicine. Equally, different forms of medicine were practised across social classes: while the upper classes employed learned physicians who were conversant with classical texts, members of the lower social classes consulted a wider range of practitioners, who offered cheaper alternatives to elite medicine. However, in all forms of medical practice, etiquette was important. Doctors were often prohibited from touching patients of the opposite sex, except to detect the strength, rhythm and character of the pulse.

The influence of traditional Chinese medicine was not confined to China. By the sixth or seventh century CE, the exchange of texts and people across regional borders had facilitated the spread of Chinese approaches to health and disease,

along with Buddhism, to Korea and Japan, partially replacing the Japanese reliance on ritual medicine performed by Shintō healers. Both Korean medicine (*hanui*) and Japanese medicine (*kanpō*) adopted the holism associated with Chinese medical practice: infectious diseases, such as plague, smallpox, measles and influenza were regarded as the result of functional imbalances in the body and interpreted in the light of beliefs that all living beings operated in accordance with the rules of nature and the cosmos. Korean and Japanese modes of treatment were also based on a mixture of secular and spiritual strategies. Like their Chinese predecessors and neighbours, doctors in ancient Korea and Japan applied acupuncture, moxibustion, herbs, massage and gymnastics to maintain health and treat disease. In this way, the ancient theories and practices first propounded by the Red and Yellow Emperors provided the basis for medicine throughout medieval China, Korea and Japan.

## Living healthily

Ancient Indian and Sri Lankan forms of medicine were based on a healing tradition that had its origins in the third or second millennium BCE. Indigenous medical knowledge was based on Sanskrit liturgical documents, the contents of which had been imparted by the Hindu god Brahma and translated by the Vedic sages into a system known as āyurvedic medicine. The principal texts were the *Caraka Samhitā* and the *Sūsruta Samhitā*, both of which were probably compiled during the first millennium CE and together formed the cornerstone of āyurvedic practice. These seminal āyurvedic works were translated into Tibetan, Arabic and English, facilitating the spread of ancient Indian medical wisdom to other regions of the world. Meaning literally ‘knowledge for long life’, āyurveda constituted not only a form of medical care but also a way of living healthily and happily. While āyurveda

flourished in the northern Indian provinces, an alternative form of esoteric magical and alchemical healing, known as Siddha, emerged in the Tamil-speaking areas of southern India.

Our understanding of ancient āyurvedic practices comes not only from medical texts but also from archaeological evidence. These suggest that ancient Indian populations suffered from a range of diseases and injuries, including epidemics of infectious diseases, skin disorders, dropsy, epilepsy, asthma, consumption and insanity. The causes and mechanisms of disease were explained in terms of humoral and spiritual balance: the body was thought to be composed of three humours (*dosas*), namely wind, bile and phlegm, and seven bodily constituents: blood, chyle, flesh, fat, bone, marrow and semen. Any disruption in the quality and quantity of the humours and elements resulted in disease. In addition, illness could be caused by evil spirits. Within this medico-spiritual scheme, lifespan was thought to be determined not only by current behaviour, including poor diet, over-exertion, excessive sexual activity and abnormal posture, but also by past deeds.

Accurate diagnosis depended initially on physical examination and analysis of the pulse. By the eleventh century CE, these procedures were supplemented by urine analysis. Prevention and treatment of disease depended on the patient maintaining or regaining appropriate measure and balance. This could be achieved by pursuing a life of moderation, rather than excess, with regard to sleep, exercise, diet and sex. When illness intervened, to restore health, healers prescribed a range of herbal preparations, minerals, vegetables and animal substances, particularly dung from cows, which were holy animals to Hindus. Hygiene was also considered important for the maintenance of health: there is archaeological evidence that some ancient Indian populations used communal baths, cleansing rites and drainage systems to prevent the spread of disease. As the *Sūsruta Samhitā* makes clear, in addition to blood-letting, āyurvedic practitioners also

employed fairly advanced surgical techniques, particularly the removal of cataracts and kidney stones, the treatment of injuries sustained in battle, and suturing. Proficiency in surgery and knowledge of anatomy were obtained partly from the examination of cadavers.

Ancient Indian medical texts also set out the qualities and behaviour expected of good practitioners. The virtuous healer was required to be knowledgeable, courteous and self-disciplined – characteristics that would not only be appreciated by patients but also ensure the satisfaction and happiness of the doctor (*vaidya*). During an oath of initiation, āyurvedic students swore to remain celibate, to speak truthfully and maintain confidentiality, to follow a vegetarian diet, and to treat women only in the company of a husband or guardian. Unscrupulous practitioners or quacks, those who tended to insult their medical colleagues and ingratiate themselves with patients for their own benefit, were to be condemned.

Vedic medicine was not the only system of preventative and prescriptive health care in ancient India. Patients seeking treatment could choose between orthodox āyurvedic medicine; alternative forms or variants of āyurvedic practice; shamanistic approaches to illness, based largely on folk traditions; and various forms of astrological medicine, which regarded children's diseases in particular as the result of malign forces or demons. In addition, while the influence of āyurvedic medicine clearly persisted, over the centuries it was subject to challenge and alterations from competing formulations of health and illness that served to identify new diseases, develop novel diagnostic techniques and establish fresh approaches to treatment. Like traditional Chinese medicine, ancient Indian medicine was therefore neither uniform nor unchanging. Indeed, in the eleventh century CE, indigenous Indian systems of healing were transformed by exposure to the principles of Greek and Islamic medicine, which were imported

during the Afghan invasions of India and which formed the basis of *ūnānī tibb*, an Indian term derived from Greek 'Ionian' medicine.

### **Plants and papyri**

Historians and archaeologists have used evidence from palaeopathology and the study of papyri to reveal patterns of disease and the cardinal features of Egyptian medicine. Archaeological studies of mummies, skeletons and clay statuettes excavated from various sites in Egypt suggest that ancient Egyptian populations suffered from a variety of conditions: intestinal infections, lung diseases such as tuberculosis and pneumoconiosis, hardening of the arteries, tumours, obesity, arthritis, wounds, dental disease, mental illness and various genetic conditions such as dwarfism have all been demonstrated. In addition, the presence of transverse 'Harris lines' on the long bones of children testifies to the arrested growth caused by malnutrition and the stress of natural disasters. Egyptian women usually married at the age of twelve or thirteen and often suffered from birth injuries, such as fistulas and prolapses, which sometimes proved fatal.

Further evidence from the papyri, which were composed either in hieroglyphs or in the hieratic script, reinforces these archaeological findings. Most of the papyri were discovered in the late nineteenth century during expeditions funded and led by Western archaeologists and anthropologists and were named in different ways: in recognition of the geographical region in which they were found, after the archaeologists and dealers who purchased them, or according to the museum or library where they were eventually deposited. The oldest of the Egyptian medical treatises is the Kahun papyrus, which dates from approximately 1900 BCE and focuses on the diseases of women and contraception. The Edwin Smith papyrus, dating from 1600

BCE and named after the dealer who bought it in 1862, sets out the features and treatment of surgical cases, while the Ebers papyrus, compiled in about 1550 BCE and purchased by the German Egyptologist Georg Ebers (1837–98) in the 1870s, is a compendium of treatments for various diseases. Other papyri, including the Berlin, Chester Beatty, Hearst and London papyri, provide a mixture of medical and magical remedies, including incantations and spells. Although magic and religion played a part in their understanding of disease, Egyptian doctors (*sinw*) and their patients, like their counterparts in China, India and Greece, explained illness predominantly in terms of humoral imbalance. The accumulation of phlegm (*štt*) in the lungs, for example, led to respiratory diseases such as bronchitis, asthma and colds.

Our knowledge of the practice of Egyptian medicine is largely limited to the work of elite physicians to the pharaohs, such as the chief physician and dentist Imhotep and the court physician, Iry. Doctors often trained and administered health care in healing temples, where patients would not only receive medicine but were also expected to offer sacrifices to specific gods or wear amulets to ward off sickness caused by evil spirits. Each speciality within medicine had a dedicated deity, such as the goddesses of childbirth, Hathor and Taurt. These deities not only determined the appearance and severity of disease but also directed the treatments prescribed by doctors. One of these gods, Horus, continues to influence modern medicine. The Eye of Horus (*Wadjet*) was believed to have protective and therapeutic properties and a variant of the hieroglyph is still used as shorthand by Western doctors to signify a prescription or treatment.

Egyptians living on the banks of the Nile, in large cities or employed in the working parties constructing pyramids and state buildings, were prone to famine and flooding, with the inevitable accompanying infestation of rats and the spread of infectious diseases. Egyptian approaches to health and illness included measures designed both to prevent and cure disease. Hygiene practices

aimed at reducing the impact of epidemics amongst crowded populations included the appointment of doctors to oversee workmen, the provision of sufficient food and the regular use of soap to improve personal appearance and cleanliness. In a ritual that pre-dated modern cosmetic fashion by over two millennia, the last of the Egyptian pharaohs, Cleopatra, is thought to have covered herself in warm wax to remove unwanted body hair. Ordinary Egyptian men and women used razors to shave and tweezers to pluck hairs, as well as applying cosmetics such as kohl and malachite. Kohl is a dark pigment derived from lead sulphide, initially used to protect the eyes from sun damage but subsequently employed, particularly by Egyptian queens, as an eyeliner or eyeshadow.

More specific treatments were recommended for particular conditions. There is some evidence from excavated skulls that dental abscesses caused by dental attrition were treated by drilling boreholes in the jaw. It is likely that surgeons regularly accompanied Egyptian armies, offering medical advice and dressing wounds. In addition, the Edwin Smith papyrus gives precise instructions on how to treat a dislocated jaw, and how to stem the blood flow and reduce the swelling of a broken nose. But it was plants that dominated the management of many diseases. The papyri suggest that Egyptian doctors advised their patients to ingest or inhale a wide range of herbal remedies: mandrake for its pain-relieving and aphrodisiac properties, resin from fir trees to clean infected wounds, aloe to remove phlegm and relieve catarrh, cinnamon to soothe ulcerated gums, and henna to delay or reverse hair loss. Honey and beer also became pivotal ingredients of Egyptian medicines, partly as vehicles for the administration of drugs: the roots of the marshmallow plant, which grew on the river banks and in salt marshes in Europe and western Asia, were combined with honey to produce a popular remedy for sore throats. Some of these Egyptian drugs were adopted by other healing traditions, such as ancient Greek and Roman or medieval

medicine, and they continue to be used in some form by both orthodox and alternative practitioners in the modern world. The evidence indicates that Egyptian medicine, rather than being seen as primitive, should be regarded as remarkably sophisticated.

Perhaps the most notable feature of ancient Egyptian civilization, apart from the pyramids at Giza, is the Egyptian attitude to the body after death. Strong belief in an afterlife led the Egyptians to make extensive preparations for the journey of the body across the threshold from life to death. Major organs, excluding the heart, because it was thought to be the seat of the soul, were removed and placed in Coptic (or Canopic) jars, which were often engraved with the four sons of Horus, and buried with the mummified bodies. This process suggests that the Egyptians had a relatively advanced knowledge of anatomy. Even when improved embalming techniques made removal of the organs unnecessary, Coptic jars continued to be placed near the sarcophagus, ensuring the persistence of an Egyptian medico-religious tradition that had started approximately 2,000 years previously.

## **Blood, phlegm and bile**

Born on the island of Kos into a medical family, Hippocrates dominated ancient Greek and Roman medicine. Surviving sources from ancient Greece, in particular the works of Galen (c. 129–210 CE) and Dioscorides (c. 40–90 CE) as well as Hippocrates, are fragmentary but, together with archaeological and palaeopathological evidence, testify not only to the complexity of Greek theories of medicine and classifications of disease but also to the range of diseases suffered by ancient Greek populations, the variety of approaches to prevention and treatment, and the ethics of good medical practice. As in earlier and parallel ancient medical traditions, Graeco-Roman medicine included elements of rational secular and natural understandings of the body and

cosmos on the one hand, and practices that appear to modern sensibilities to be irrational magico-religious beliefs on the other.

Although Hippocrates became the archetypal ancient doctor and was referred to by Plato (428–348 BCE) as ‘the famous physician’, it is important to recognize that even before Hippocrates many Greek doctors and natural philosophers had provided a theoretical and practical basis for Graeco-Roman medicine. Influenced partly by features of Egyptian and Babylonian medicine that had been imported by itinerant doctors, physicians such as Democedes (sixth century BCE), Alcmaeon of Croton (490–430 BCE) and Apollonides (fifth century BCE) established the importance of humoral balance or symmetry within the body and identified many natural herbal remedies for specific symptoms. Nevertheless, it is true that most of our knowledge of Greek medicine comes from the Hippocratic Corpus, much of which was subsequently translated, analysed and interpreted by other ancient (and eventually medieval) authors such as Erasistratus (c. 315–240 BCE), Celsus (25 BCE–50 CE), Aretaeus of Cappadocia (c. first to second centuries CE) and, most importantly, Galen.

The Corpus comprises nearly sixty treatises on the causes, prevention and treatment of sickness. Some of the works focus on specific types of injury and disease, including epidemics, epilepsy, fractures and diseases of women. Others either offer advice on particular clinical problems, including the difficulties of accurate prognosis and the importance of regimen or lifestyle in determining the symptoms and outcome of disease, or provide philosophical but pragmatic reflections on contemporary theories of disease, including close attention to the relationship between health and the environment. One of the most influential elements of the Hippocratic Corpus is the collection of memorable aphorisms that became a standard educational text for medieval and Renaissance medical students. In addition to explaining the difficulties of practising medicine, the aphorisms provided accessible advice on many aspects of diagnosis, prognosis and treatment: ‘When a

### THE HIPPOCRATIC OATH

I swear by Apollo the physician, Asclepius, Hygeia, and Panacea and I take to witness all the gods, all the goddesses, to keep according to my ability and my judgment, the following Oath and agreement:

To consider dear to me, as my parents, him who taught me this art; to live in common with him and, if necessary, to share my goods with him; to look upon his children as my own brothers, to teach them this art; and that by my teaching, I will impart a knowledge of this art to my own sons, and to my teacher's sons and to disciples bound by an indenture and oath according to the rules of the profession, and no others. I will prescribe regimens for the good of my patients according to my ability and my judgment and never do harm to anyone. I will give no deadly medicine to anyone if asked, nor suggest any such counsel; and similarly I will not give a woman a pessary to cause an abortion. But I will preserve the purity of my life and my art. I will not cut for stone, even for patients in whom the disease is manifest; I will leave this operation to be performed by practitioners, specialists in this art. In every house where I come I will enter only for the good of my patients, keeping myself far from all intentional ill-doing and all seduction and especially from the pleasures of love with women or men, be they free or slaves. All that may come to my knowledge in the exercise of my profession or in daily commerce with men, which ought not to be spread abroad, I will keep secret and will never reveal. If I keep this oath faithfully, may I enjoy my life and practise my art, respected by all humanity and in all times; but if I swerve from it or violate it, may the reverse be my life.

person who is recovering from a disease has a good appetite but his body does not improve in condition', warned Hippocrates, 'it is a bad symptom'. Perhaps the most well-known element of the Corpus, however, was the Hippocratic Oath, which set out the standards of behaviour expected of medical practitioners and has retained its legal and ethical significance into the modern period.

In Hippocratic medicine, health and disease, as well as character and personality, were thought to be determined not by divine interference but largely by balances or imbalances in the four bodily humours: blood, phlegm, yellow bile and black bile. An

excess or depletion of one or more of the humours resulted in obstruction or dysfunction of the organs, leading to the signs and symptoms of disease. Although many of his peers regarded epilepsy as a sacred or divine disease, for example, Hippocrates insisted that its cause lay simply in the accumulation of phlegm in the brain. It is important to note that the natural system of balance embedded in Hippocratic formulations of humoralism was not confined to medicine. According to many ancient authors, the four humours were correlated to the four elements (earth, air, fire and water), the four primary qualities (hot, dry, cold and wet), the four temperaments (phlegmatic, melancholic, sanguine and choleric), and the four seasons. As in Chinese and āyurvedic medicine, balance and symmetry were key Greek concepts in explaining the capacities of individuals, societies and the cosmos, as well as health and disease.

The doctrine of the humours was employed to explain not only individual, and often hereditary, predispositions to certain diseases but also the susceptibility of particular groups of patients to particular diseases. Women and children were considered to be cooler and moister than men and therefore more vulnerable to diseases caused by an excess of phlegm, such as dysentery, asthma and catarrh. Humoral theory also lay at the heart of an approach to health care that focused on environmental conditions. Patterns of health and illness in different geographical regions were thought to be determined by the strength and direction of the wind, by the location of clean and polluted water sources, and by seasonal changes in the weather. In his treatise on *Airs, Waters and Places*, Hippocrates offered advice to people of different constitutions on where to live at certain times of the year to alleviate the symptoms of particular diseases, thereby establishing what could be regarded as an early form of medical meteorology.

The Hippocratic Corpus contained classic descriptions of the many diseases that afflicted ancient Greek populations, including consumption, tetanus, pleurisy, asthma, diabetes, certain types of cancer and various forms of mental illness such as mania and

melancholy, which were similarly attributed not to divine intervention but to the effects of bile and phlegm in the brain. Ancient Greek populations were decimated by wars, famine and plagues, which were sometimes spread by new agricultural practices and domestic animals or brought in along trade routes. Indeed, the growing economic reliance on livestock, including sheep and goats, may well have encouraged the spread of bacterial and parasitic diseases, such as anthrax, plague and rabies. The ancient Greeks were also more likely to suffer from illnesses caused or exacerbated by poor sanitation, inadequate diets, unhealthy occupational conditions and, on occasion, profligate lifestyles. The prevalence of disease and high infant mortality ensured that the average life expectancy of Greek and Roman populations was in the region of only twenty or thirty years. However, if someone survived beyond infancy they might live to the age of sixty.

Ancient Greek and Roman patients consulted a wide range of healers, including physicians, midwives, medical attendants or physical trainers, herbalists and astrologers, who offered advice not just on matters of health and sickness but also on the maintenance of vitality, fitness and appearance. For the most part, élite physicians were men but there were some women practitioners who provided treatment to other women, particularly in the management of childbirth. In some locations the fees charged by doctors and midwives could be regulated by the state. Although the social and professional boundaries between the various categories of medical practitioners were not always clear-cut, male physicians were assumed to possess superior moral character, higher educational qualifications and more extensive professional experience, and they certainly enjoyed greater official recognition from civic authorities than other practitioners. In this way, the structure and conventions of ancient medical practice reinforced, as well as reflected, social and cultural values.

The diagnosis of disease was made by taking a history and by thorough observation and examination of the patient's appearance, pulse, movement and excretions. In general, treatment was

gentle and expectant, allowing the natural healing power of the body (*vis medicatrix naturae*) to exert its effect, aided by careful attention to diet, exercise, sleep and the environment, and only occasionally bolstered by more invasive therapies such as herbal remedies, massage, purging and blood-letting or cupping (see Figure 2). However, these secular treatments were often combined with religious rituals. When patients came to a healing temple, or *asklepion* (named after the Greek god of medicine, Asklepius), where many doctors were trained, they made sacrifices and presented votive offerings that were intended to appease the gods and restore health. In this way, the natural and holistic Hippocratic approach was blended with magico-religious, astrological and folk medicine.



**Figure 2** Vessel for cupping (a form of blood-letting) discovered in Pompeii, dating from the first century CE (Wellcome Library, London)