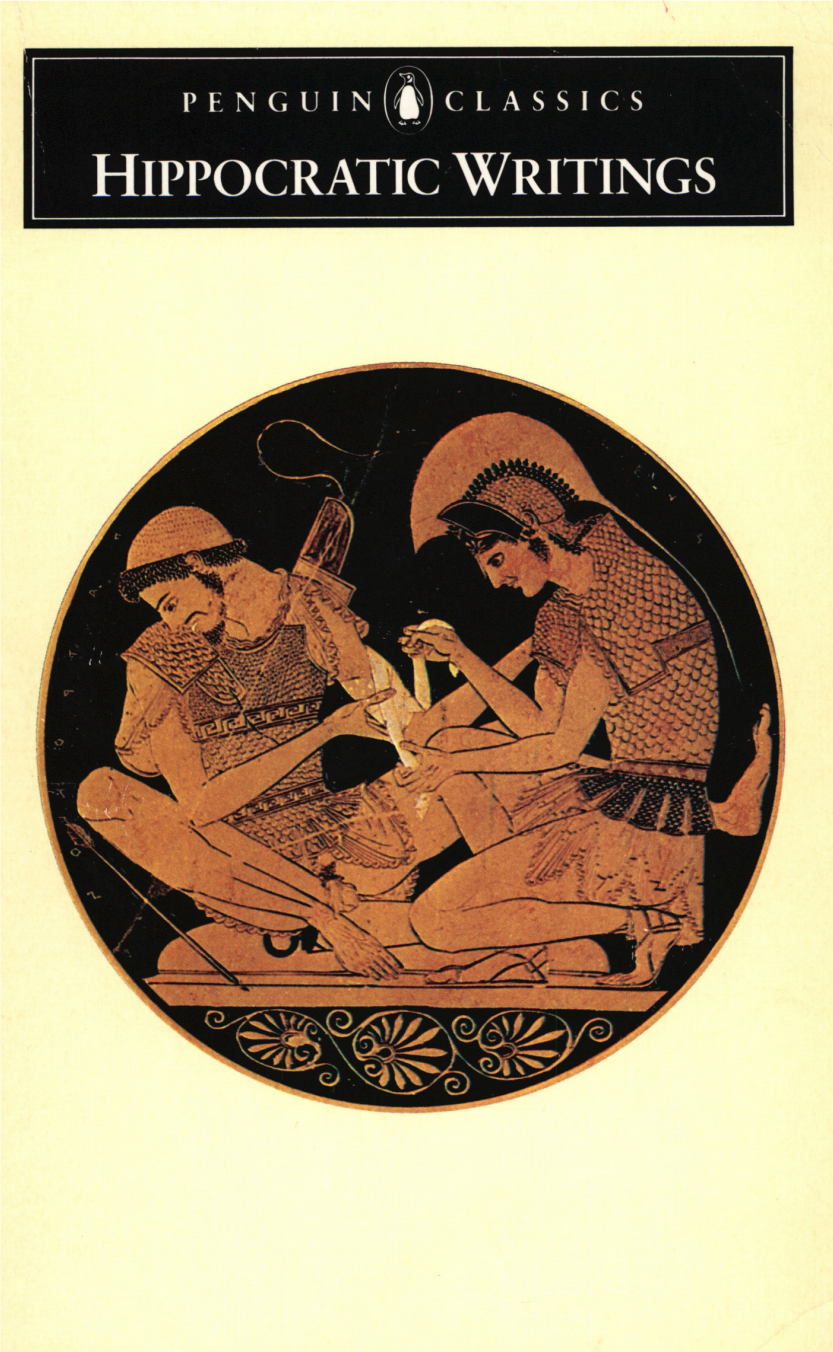
Hippocratic Writings



G.E.R. Lloyd
Editor

PENGUIN CLASSICS

HIPPOCRATIC WRITINGS

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HIPPOCRATIC WRITINGS

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PREFACE

THE bulk of the Hippocratic Corpus is such that only a small proportion of the extant treatises can be included in a book such as this. The aim has been to present a selection of the most important and interesting treatises in the best available English translations. Many of the most famous treatises, including *The Oath*, *Tradition in Medicine* (otherwise known as *Ancient Medicine*), *The Sacred Disease*, and the first and third books of *Epidemics*, were translated by Dr J. Chadwick and Dr W. N. Mann in the volume entitled *The Medical Works of Hippocrates*, published by Blackwell, Oxford, in 1950. The translations in that volume, which are reproduced complete, with minor revisions, except for *Coan Prognosis*, form the major part of the present selection.

As the title of their book implies, the translations of Dr Chadwick and Dr Mann were of *medical* works. Translations of four of the outstanding non-medical treatises in the Hippocratic Collection have been added.

(1) The translation of *Fractures* by Dr E. T. Withington, originally published in volume three of the Loeb edition of Hippocrates (Heinemann, London; Harvard University Press, Cambridge, Mass.) in 1928; *Fractures* is one of the two major surgical treatises (the other being *Joints*) in the Hippocratic Collection.

(2–3) Translations of *The Seed* and *The Nature of the Child* by Dr I. M. Lonie from the forthcoming Ars Medica series volume, containing edition, translation and commentary, by Dr Lonie and Professor G. Baader. Together with the work known as *Diseases* IV, *The Seed* and *The Nature of the Child* form the group of so-called embryological treatises that were almost certainly composed by the same author and that deal with the problems of generation, heredity and sex differentiation as well as with the growth of the embryo.

(4) A translation of *The Heart*: this, though later in date

than most of the other Hippocratic treatises, is the outstanding work dealing with an anatomical subject in the Collection. In this case the translation by Dr I. M. Lonie has been undertaken specially for this volume.

It is a pleasure to record my thanks first and foremost to Dr Chadwick, Dr Mann and Dr Lonie, whose help and counsel have greatly facilitated my work as editor; to Professor Finley, who initiated the idea of such a volume; to my father, Dr W. E. Lloyd, for advice on medical matters, and to my son, Matthew, for help in preparing the index.

G. E. R. L.

Cambridge, February 1973

INTRODUCTION

In Western medicine, the name of Hippocrates has always stood for an ideal. Until comparatively recently in the history of Western medical thought, his views – that is, the views of the works that passed for his – were accepted as authoritative on all kinds of medical problems, and medical students read their Hippocrates not out of piety but as an essential part of their training as doctors. That is no longer the case: yet Hippocrates still represents an ethical ideal, the ideal of the compassionate, discreet and selfless doctor, and those who graduate from the medical schools of Scottish universities still, in 1973, subscribe to a version of his oath. Moreover, while the importance of Hippocrates has declined with the advance of modern medical knowledge, from another point of view the Hippocratic writings have not lost but gained in interest, as scholars have come to appreciate more fully their role in the development of Greek science, and in the subsequent history of Western science as a whole. Although Hippocrates is no longer assumed to be the repository of all medical wisdom, the importance of the writings associated with his name is threefold: first for the still living ethical ideal of the doctor that they represent, second for the insight they provide into the origins and development of rational medicine in the West, and third for the extraordinary influence that they exercised over medical thought over so many hundreds of years.

THE HIPPOCRATIC COLLECTION

The collection of medical writings known as the Hippocratic Corpus consists of about sixty treatises, some in several books, that vary widely in subject-matter, style and date. Although most of the treatises were written between 430 and 330 B.C., some are later works. The subjects covered include general pathology and the pathology of particular conditions,

diagnosis and prognosis, methods of treatment and of the preservation of health, physiology (the constitution of man), embryology, gynaecology, surgery and medical ethics. A few of the treatises are carefully composed lectures, some of which appear to be addressed to a general audience: that is, an audience that included laymen as well as medical students or doctors. Some other treatises too are fairly clearly defined entities, for example text-books dealing with a particular subject, or works arguing a particular thesis on a theme or themes announced at the outset. But a large number are composite productions, collections of diverse material, in some cases probably the work of several hands. Scrapbooks or notebooks such as the *Aphorisms* were not designed as unities and were often subject to additions and interpolations. Many of the Hippocratic treatises are practical manuals, and those who used them in the fifth and fourth centuries B.C. were, we may assume, far less concerned with such questions as the exact reading of the original text or the identity of the author or authors than with the substance of their contents, that is, the useful medical knowledge they contained.

The Corpus is evidently the work of a large number of medical writers, belonging to different groups or schools and representing in many cases quite opposed viewpoints, not only on such questions as the aetiology of diseases and the correct methods of treatment, but also on the methods and aims of medicine as a whole. Thus apart from the school of Cos, associated with Hippocrates himself, the rival school of Cnidus was probably responsible for several of the works in the Corpus, although widely differing views have been held on the identity of these Cnidian treatises.

Although numerous attempts have been made to identify, within the Corpus, the genuine works of Hippocrates himself – a problem that already exercised the ancient commentators on these writings – none can be said to have succeeded in this aim. The evidence available to us is poor and at points conflicting. Most of our detailed information about the life of Hippocrates comes from late and generally untrustworthy sources. Our earliest and most reliable authorities are Plato,

Aristotle, and Aristotle's pupil, the historian of medicine Meno. They tell us that Hippocrates came from Cos and that he was an approximate contemporary of Socrates (later sources date his birth more precisely, usually to 460 B.C.). They also prove that Hippocrates soon became famous as a doctor and they establish the not unimportant fact that he taught medicine for a fee, but they do not provide definite enough information concerning either his methods or his doctrines to enable us confidently to ascribe to him any one of the treatises in the Collection. In the absence of convincing arguments for authenticity, those who have discussed the problem have all too often fallen back on the supposition that Hippocrates must be the author of the treatises that they happen to value most highly. The Hippocratic treatises, as they have come down to us, are all anonymous. It is possible that they contain some of Hippocrates' own work. But there is no means of establishing with certainty, or even with a high degree of probability, that this is so or, if so, which work is his. The one treatise whose authorship can be settled with some confidence is *The Nature of Man* (or at least the major part of that composite work), and the author in question is not Hippocrates but his son-in-law Polybus. It must, however, be stressed that the importance of the Hippocratic Collection is independent of any connection with Hippocrates the man.

While individual treatises are occasionally referred to in closely contemporary writings, the Collection as such cannot be traced back before the work of the first commentators and lexicographers in the third century B.C. The suggestion that it was put together, in the main, by scholars working at Alexandria at that time offers perhaps the most likely explanation of its origin. But once the nucleus of the Collection existed and had become associated with the name of the most famous doctor of the classical period, it was no doubt subject to later additions and exercised a powerful attraction on other anonymous medical literature, including some works that were evidently composed much later than the bulk of the Corpus. Thus of the treatises included in this selection, *The Heart* has been dated, on the grounds both of style and of

content, after Erasistratus of Ceos, an important Hellenistic doctor and biologist who was active about 260 B.C. A study of the ancient commentators shows that there were always considerable variations in what passed for Hippocrates, and this is also reflected in the fact that the treatises contained in our different manuscript traditions for the Hippocratic texts vary appreciably. Despite the scholarly attention that these works received in antiquity, no single authorized canon of Hippocrates was established.

Although the variety of views represented in the Hippocratic writings, and the complexity of the interrelations of different treatises or groups of treatises, are a source of some dismay to those who seek to identify the work of a particular author or authors, the controversies reflected in the Corpus provide precious information concerning the growth of rational medicine in Greece. Evidently many fundamental early Greek medical ideas were formed in the crucible of the type of debate exemplified in the Corpus – debates in which not only particular theories and practices but also the whole question of the nature and aims of medicine itself were discussed. Indeed the disputes on such topics, both within the medical profession and between the doctors on the one hand and the philosophers on the other, illuminate not only the development of medicine but also that of science as a whole in Greece. Quite apart from the wealth of information about early Greek medicine that we gain from the Hippocratic writings, they provide, as we shall see, invaluable first-hand evidence relating to certain crucial aspects of the growth of scientific inquiry in early Greek thought.

THE MEDICAL PROFESSION IN THE FIFTH AND FOURTH CENTURIES

The Hippocratic writings stand at the beginning of systematic medical inquiry in Greece. To be sure, the Greeks themselves liked to trace the origins of medicine back through the heroic figures of Machaon and Podalirius, mentioned in Homer, to the mythological divine founder Asclepius, and we have no

reason to doubt that many of the treatments employed from the sixth century onwards, including such a difficult and dangerous one as the practice of trephining, had been used not only in Greece itself, but also in other areas of the Near East,* long before. Yet it was in the late sixth or early fifth century that the first sustained critical investigations into the causes and treatment of diseases began and that we find the first attempts to define and defend the status of medicine as a rational discipline or *technē*.

It is important to recognize at the outset, however, just how precarious the practice of medicine was at the time when the Hippocratic authors were writing. Although we may speak loosely of those who engaged in medical practice full-time as professional doctors, medicine was not a profession in the fullest modern sense of that term. The essential point is that, unlike his modern counterpart, the ancient doctor possessed no legally recognized professional qualifications. Anyone could claim to heal the sick, and the doctors were in competition not only with midwives, herbalists and drug-sellers, but also with the type of 'purifiers' and sellers of charms and incantations who are criticized and rebutted in *The Sacred Disease*. Again, the distinction between the doctor and the gymnastic trainer was sometimes a fine one, and experience in the gymnasia was an important part of the training of many of those who practised medicine and surgery in ancient Greece.

The insecurity felt by doctors about their own position is evident in the way the Hippocratic writers frequently find it necessary to uphold the claim that there is such a thing as

*The question of the debts of Greek medicine to the medicine of their ancient Near Eastern neighbours, particularly the Egyptians, is obscure and controversial. The famous Edwin Smith papyrus, which dates from around 1600 B.C. but incorporates much earlier material, shows that detailed case-histories had begun to be collected in Egypt long before medicine became established in Greece. It has also recently been argued that the Cnidian school of Greek doctors in particular derived certain pathological doctrines from Egypt. Yet though the remains of Egyptian, Assyrian and Hittite medicine are impressive, there is nothing comparable with the systematic debates on, for example, the causes of diseases and the nature of medicine itself that we find in the Hippocratic Corpus. They, so far as we can judge, were a new phenomenon.

medicine and that it is a genuine *technē*, the Greek term whose range covers both what we should call arts and crafts and what we should call sciences. Indeed the whole of the treatise *The Science of Medicine* is devoted to this theme and to defending medicine against its detractors. In chapter 3, for instance, the writer says: 'First of all I would define medicine as the complete removal of the distress of the sick . . . It is my intention to prove that medicine does accomplish these things and is ever capable of doing them. And as I describe the science I shall at the same time disprove the arguments of her traducers.' Other Hippocratic authors too repeatedly insist on the distinction between the doctor and the mere layman* and on that between the doctor and the quack or charlatan. Yet the doctor had no formal qualification to point to in support of his claim.

As in the case of other arts, those who wished to practise medicine normally received their elementary training by becoming attached as assistants to established doctors. It helped to have been associated with the doctors at one or other of the best known centres of medical training. Already in the late sixth century, two Greek city-states, Croton (in Magna Graecia, now southern Italy) and Cyrene (in North Africa), were famous for their doctors, and in the fifth century, Cos, the birthplace of Hippocrates, and Cnidus, just opposite it on the mainland of Asia Minor, developed flourishing medical schools, in both senses of the word 'school': they became the main centres for the teaching of medicine, and the doctors associated with either place shared certain medical doctrines and practices.† Yet while the concentration of medical men

* *idiōtēs*, the word from which the English 'idiot' is derived.

† Some characteristic Cnidian doctrines can be identified, thanks to the criticisms of them that we find in *Regimen in Acute Diseases* and in Galen's commentary on that work. Thus according to Galen the Cnidians went in for fine distinctions in their classification of diseases, identifying no less than twelve separate diseases of the bladder and four of the kidney; and it appears that bile and phlegm played a particularly prominent role in their aetiology of diseases. Their therapeutics are explicitly criticized in *Regimen in Acute Diseases* on the grounds that they used too few remedies: 'They generally prescribe opening medicine and recommend their patients whey and milk to drink.'

in such places was obviously advantageous to the student, instruction was still, one must assume, largely informal. There was certainly no set term to the period of training that a medical student should undergo, nor at the end of it did he obtain certification of his right to practise. His establishing himself as a doctor depended less on how he had been trained than on the reputation he acquired in practice, and where the whole question of his basic competence might be disputed at any stage, the problems he faced in winning and keeping the confidence of his clients were formidable.

In general Greek doctors practised privately, but occasionally we hear of doctors being employed, usually for a year at a time, by a city-state. Evidence for the institution of public doctors goes back to the sixth century, but their role and duties are disputed, and it is not clear precisely how extensive this institution was. It is unlikely that the intention of such appointments was to provide a free state health service for all, or even for all the citizens, and it may be that all that the state required and paid for was that the doctor should reside and practise in the city. To be sure, the late Hippocratic treatise *Precepts* (ch. 6) recommends that doctors should, where necessary, be prepared to treat their patients without payment, and we may assume that this sometimes happened. But the usual rule was that doctors charged their patients for their services, no doubt adjusting their fees to their patients' means, and it is possible that this is what the public doctors also did.

While some doctors were permanently resident in a particular city, a large number travelled from place to place in search of a living and in response to the varying demand for their services. One of the treatises in our selection, entitled *Airs, Waters, Places*, is a manual whose chief purpose is to help the itinerant doctor to anticipate the different types of diseases that are likely to occur in cities with different geographical and physical conditions. The writer distinguishes, for example, the diseases that are likely to be common in cities exposed to the north winds, in those facing south, in those where the water supply comes from stagnant sources such as marshes and in

those where it comes from rock springs. The writer's presuppositions are highly schematic, but the problem of adapting to local conditions was a real one for the itinerant practitioner.

The comparatively insecure position of the doctor is reflected in many features of Greek medical practice. Thus one of the explicit aims of the practice of diagnosis and prognosis is to impress the patient and win his confidence. The work entitled *Prognosis* indicates that the Greek doctors tried to tell their patients not only what was going to happen to them but also their present and past symptoms. The author recommends (ch. 1) that the doctor should fill in the details that the patients themselves have omitted: he will thereby 'increase his reputation as a medical practitioner and people will have no qualms in putting themselves under his care'. The practice of prognosis was evidently an important psychological weapon in the battle to win the patient's confidence.

Similar preoccupations underlie the advice, given in several Hippocratic texts, not to undertake hopeless cases. It is true that another point of view is also sometimes expressed, namely that however hopeless the case the doctor should do whatever he can to help the patient; and the authors of the works known as the *Epidemics*, for example, clearly had no compunction in admitting that a large number of the cases they described – and that were presumably under their care – ended in death. Indeed in books I and III, the majority of the case-histories described (25 out of 42) have a fatal outcome. Yet apart from considerations of honesty, the need to protect one's reputation was with some writers an important factor. Thus *The Science of Medicine* (ch. 3) even takes as a defining characteristic of medicine 'the refusal to undertake to cure cases in which the disease has already won the mastery, knowing that everything is not possible to medicine'. The author of *Prognosis* (ch. 1) is also aware of the problem: 'By realizing and announcing beforehand which patients were going to die, he would absolve himself from any blame.'

Even more striking are the views expressed by the author of *Fractures* on the dilemma the doctor faces. Describing the reduction of the thigh and the upper arm, the writer notes

(ch. 35) that 'in such injuries . . . one must not overlook the dangers or the nature of some of them, but foretell them as suits the occasion'. But then in the next chapter, although he gives more information concerning the treatment of such cases – on, for example, the diet to be prescribed – he ends: 'One should especially avoid such cases if one has a respectable excuse, for the favourable chances are few, and the risks many. Besides, if a man does not reduce the fracture, he will be thought unskilful, while if he does reduce it he will bring the patient nearer to death than to recovery.' The selflessness and dedication shown by many Greek doctors can be seen not only in such works as the *Epidemics*, but also in, for example, Thucydides' account of the plague at Athens (II, 47ff.) - where he notes the high incidence of mortality from the disease among the doctors who attempted to treat it. Yet the relationship of trust between patient and doctor was a fragile one, and this is reflected in the doctors' anxieties concerning the repercussions of any apparent failure.

On the question of the civil status of those who practised medicine, a passage in Plato's *Laws* has been taken to suggest that there was a clear distinction between the clientèles of doctors who were themselves slaves and of those who were free men. At *Laws* 720 cd he speaks of free doctors treating the free and of slave doctors treating their fellow-slaves. Yet this evidence must be treated with caution. We must certainly take it that there were slaves among those who were called doctors and who practised medicine in the ancient world. It seems unlikely that any of the Hippocratic authors was not free, but we have simply no direct information on this point. Yet in one respect, at least, the evidence of Plato is contradicted by what we find in the Hippocratic Corpus. The patients whose case-histories are recorded in the *Epidemics* include representatives from all walks of life, rich and poor, citizens, slaves and visitors from abroad.

The social status of doctors no doubt also varied a good deal. Despite the fact that Hippocrates taught medicine for money, there is a striking contrast between the way he is referred to in Plato and the way Plato treats most of the

professional educators or sophists. In Plato's *Protagoras* (311b ff.) Hippocrates is on a par with the great sculptors Polycleitus and Pheidias. In the *Phaedrus* (270c ff.) Hippocrates is first mentioned by Phaedrus, but then Socrates proceeds to equate what Hippocrates has to say with the true account of the matter, whether this is out of deference to Hippocrates, or to Phaedrus, or to both of them. The way in which the doctor Eryximachus is portrayed in Plato's *Symposium* is also revealing. Eryximachus is clearly no armchair medical theorist, but a man of experience, who is keen to show his respect for his art. Though at times rather pompous, he is depicted on the whole sympathetically, and the seriousness of his treatment of the theme of love helps to pave the way for the climax of the dialogue in Socrates' speech. Anyone who earned money by practising a skill was liable to be treated as a social inferior by men whose leisure was guaranteed by inherited, usually landed, wealth, and this was often the fate of doctors in Greece, and more especially later in Rome. Yet at Athens in the classical period Plato represents Eryximachus (and one must presume there were many doctors like him) as associating on equal terms with the other guests at the symposium, who include the poet Aristophanes and the statesman Alcibiades.

It is clear that, despite the hazards of medical practice, some doctors were highly successful and earned large sums of money. This can be seen, for example, from the story of Democedes of Croton, reported in Herodotus (III, 129ff., especially 131). Democedes was employed as a public doctor in three successive years, by the city-states of Aegina and Athens and by Polycrates of Samos, and each year his salary increased, being first one talent, then 100 minae, then two talents. The value of these sums can be judged from the fact that the normal daily wage of a skilled worker in the late sixth and early fifth centuries was a drachma – there being 100 drachmae to the mina and sixty minae to the talent. Nor is it likely that Democedes' salary as a public doctor was his only source of income. He may well have had fees from some of his patients in addition, and, as we have seen, it was also

possible for a doctor to earn money by teaching medicine, whether to students intending to practise medicine themselves or (as I shall indicate later) to people who wanted to learn something about medicine simply as part of their general education. But Democedes' case was no doubt an exceptional one: Herodotus notes that the fame of the doctors of Croton was largely due to him. The income of ordinary doctors must have ranged within wide limits according to their skill and reputation and according to the varying demand for their services.

Several of the Hippocratic treatises that deal with questions of medical etiquette and ethics warn the doctor against avarice. *Precepts* (ch. 6) recommends that the doctor should consider the patient's means in fixing fees and, as already noted, suggests that the doctor should be prepared, on occasion, to treat a patient for nothing. The same work also says (ch. 4) that the doctor should not begin a consultation by discussing fees with his patient. This may well cause the patient anxiety, for he may believe that the doctor will abandon him if no agreement over fees is reached. As the writer puts it: 'It is better to reproach patients you have saved than to extort money from those in danger of dying.' *Decorum* (ch. 5), too, mentions lack of the love of money as one of the qualities a good doctor should show. The treatises in which these sentiments are expressed are later than the bulk of the Hippocratic Corpus and belong to the period after Aristotle. Later still, we find plenty of complaints, in both Greek and Roman writers, concerning the greed and cupidity of doctors who are sometimes described as making colossal fortunes from their gullible patients. One such writer is Pliny (first century A.D.), who goes into the topic at length in book 29 of his *Natural History*. No doubt he and others who dwelt on this theme are guilty of some exaggeration, but it is evident that from the end of the fourth century B.C., at least, it was quite commonly believed both that some doctors were avaricious and that large sums of money were to be earned by the most successful practitioners.

Although the boundary between doctor and layman was far

from being clearly defined, this did not prevent attempts being made, in some quarters at least, to limit and control those who became doctors. One text that is relevant to this point is the Hippocratic *Oath*. The questions of who took this oath in the ancient world and how representative were the ideas expressed in this work are hotly disputed. Certainly some of the specific injunctions, for example not to operate 'even for the stone', run counter to common Greek medical pratices of the fifth and fourth centuries B.C., and it has therefore been thought likely that, although many of its ideals and beliefs were widely shared, *The Oath* as such belongs to a particular group of practitioners rather than to Greek doctors as a whole. But on the specific question of who should be taught medicine, *The Oath* is explicit: 'I will hand on precepts, lectures and all other learning to my sons, to those of my master and to those pupils duly apprenticed and sworn, and to none other.' Evidently this group of doctors, at least, set up rules both to govern who was to be allowed to receive medical instruction and to make sure that these rules themselves were handed on to each successive generation of students.

Finally, one further manifestation of some of the pressures on the medical profession is the phenomenon of intentional obscurity in some medical writings. In many cases, to be sure, our difficulty in understanding Greek medical literature stems from other causes, such as the corruption of the text or the lack of background knowledge. But it seems clear that in some works obscurity of expression has been deliberately cultivated. This is particularly true of such treatises as *Nutriment* and *Humours*, whose style is not just pithy, but opaque, oblique and elliptical, and which appear to have been composed with a particular esoteric audience in mind. In the ancient world not only the initiates of the mystery religions, but also, for example, the early followers of Pythagoras, were required, in their different contexts, to practise secrecy. To judge from the frank character of most of the extensive extant medical literature of the fifth and fourth centuries, Greek doctors were in general quite open about their ideas, practices and discoveries. Yet we have seen that medicine was both a competitive and a

precarious calling, and some doctors not only formed closely-knit sects, but were also positively secretive about their art, and prepared to write about it only in veiled language that none but the initiated would understand. Thus as *Decorum* (ch. 18) puts it, cryptically enough, 'things that are glorious are closely guarded among all men', while the *Canon* ends in terms that deliberately echo those of the mystery religions: 'Holy things are revealed only to holy men. Such things must not be made known to the profane until they are initiated into the mysteries of science.'

HIPPOCRATIC MEDICAL THEORIES AND PRACTICES

Greek ideas on the causes of diseases were extremely varied and it should be emphasized at the outset that there is no such thing as the one, nor even the single dominant, Hippocratic medical doctrine. Theories on the subject ranged all the way from the belief that all diseases have a single origin to the view that there are as many different diseases as there are patients, or that wherever any difference whatsoever can be found between two sets of symptoms, two different diseases must be diagnosed. Controversy also raged, both between different schools and between individuals of the same school, on the question of the nature of the causal factors at work. All we can hope to do here is to outline some of the more common and important notions.

Despite considerable differences on the explanations of diseases, there was a wide measure of agreement among the Hippocratic doctors on the names and descriptions of the main kinds of condition. In general, conditions were identified either by the part of the body affected, or by the most prominent signs or symptoms. Examples of the first are *nephritis* (from *nephros*, kidney), *hēpatitis* (from *hēpar*, liver), *pleuritis* (cf. our pleurisy, from *pleura*, rib or side), *arthritis* (from *arthron*, joint) and *ophthalmia* (from *ophthalmos*, eye), examples that also illustrate the longevity of Greek medical terminology, although nowadays the same, or derived, term may not be used to refer to the same condition, or may be used to refer to a

similar condition now understood quite differently. Examples of the second kind are *phthisis* (consumption, literally wasting), *hydrōps* (dropsy, from *hydōr*, water), *tetanos* (from *teinō*, stretch) and *strangouria* (strangury, from *stranx*, trickle, drop, and *ouron*, urine).

Many of the most common Greek terms cut across modern medical categories and are strictly untranslatable. One instance noted by Drs Chadwick and Mann is the word *causus*. As they observe, in some, but not all, cases enteric fever is clearly described, but the term is used of a variety of fevers which we now separate into a number of different diseases. Fevers in general were classified by the Greeks according to their observed or imagined periodicities. Thus tertians were fevers where a 'crisis' or marked change in the symptoms occurred every third day by Greek reckoning (that is, every other day by ours: the Greeks counted both the first and the last day). Others were termed quartans, quintans and so on, and those that did not manifest obvious or definite periods were called 'disorderly' or 'wandering'. Where, as often, the Greeks identified diseases from signs and symptoms, there is no hard and fast distinction between the term used descriptively of the sign itself, and the same term used inferentially, implying an interpretation or diagnosis of the disease in question.

Disease was generally seen as some sort of imbalance in, or disturbance of, the natural state of the body, and the notion of diseases being hostile to nature or to the body runs through many Greek medical writers of different theoretical persuasions. The doctor's role was to combat the disease or to help nature to do so. This idea of a war between the disease on the one hand and the doctor and nature on the other was, however, associated with many different explanations of the origins of diseases.

One way of subdividing the causal factors in diseases was into internal and external ones. *The Nature of Man* (ch. 9) has this argument: 'When a large number of people all catch the same disease at the same time, the cause must be ascribed to something common to all and which they all use; in other words to what they all breathe ... However, when many

different diseases appear at the same time, it is plain that the regimen [that is, diet and exercise] is responsible in individual cases.' Different writers refer to a wide variety of external and internal factors, whether or not they accept that argument. Thus among external factors, apart from the air we breathe, the winds and the seasons generally were thought to cause diseases. The north and south winds in particular are often represented as being especially influential. The author of *Aphorisms* writes (Sec. III, ch. 5): 'South winds cause deafness, misty vision, headache sluggishness and a relaxed condition of the body ... The north wind brings coughs, sore throats, constipation, retention of urine accompanied by rigors, pains in the sides and breast.' And the author of *The Sacred Disease* believes that epilepsy is more likely to occur when there is a change in the wind and he devotes chapter 16 to describing the effects of the north and south winds both outside and inside the body.

Particular diseases were often correlated with particular seasons or weather conditions. In the 'constitutions' preceding the case-histories, the books of *Epidemics* contain detailed descriptions of the weather conditions accompanying outbreaks of diseases, and many writers suggest that abnormal weather or sudden changes in it cause diseases. *Airs, Waters, Places*, which aims to provide information about the seasons that will enable the doctor to foretell how the year will turn out, emphasizes that the successful practice of medicine depends on knowing 'what changes to expect in the weather' (ch. 2), and the author remarks (ch. 11) that 'it is particularly necessary to take precautions against great changes'. Again, *Aphorisms* states the common doctrine generally (Sec. III, ch. 1): 'The changes of the seasons are especially liable to beget diseases, as are great changes from heat to cold, or cold to heat in any season. Other changes in the weather have similarly severe effects.'

The internal factors most commonly mentioned are diet and exercise (both of which are included in the term 'regimen'). Several writers develop a theory of the need to balance these two. Thus the author of *Regimen* I (ch. 2) states that food and

exercise have opposite powers but that they both work together to produce health, and it was often held that diseases are caused by excess either in overeating or in fasting – or more generally by any state of 'repletion' or fullness, or 'depletion' or emptiness.

Regimen I and other treatises maintain that eating the wrong foods, or too much or too little food, disturbs the balance of the natural constituents of the body, but there was as little agreement among the medical writers as to what these constituents are, as there was among the philosophers concerning the more general question of the fundamental elements of all physical bodies. *Regimen* I claims that the constituents of all things, including man, are fire (thought of as hot and dry) and water (thought of as cold and wet). In this the author is obviously influenced by, and remains close to, pre-Socratic physical speculation. The philosopher Empedocles, in particular, was responsible for the first clear statement of what was to become one of the most important and influential physical theories in antiquity, namely that all things consist of earth, water, air and fire, although this theory had many rivals, especially in the various ancient versions of atomism.

As is clear not only from the theories that are either stated or attacked in the Hippocratic Corpus, but also from the evidence of the papyrus Anonymus Londinensis, which preserves fragments of the history of medicine written by Aristotle's pupil Meno, a great variety of physical theories based on one or more of the four Empedoclean elements, or on one or more of the four primary opposites, hot, cold, dry and wet, were current among medical writers in the late fifth and early fourth centuries. But some doctors developed physical theories concerning the elements in the body, and corresponding pathological doctrines concerning the origins of diseases, in terms of other factors, for example 'the sweet', 'the bitter', 'the acidic', 'the astringent', 'the insipid' and so on; these too, like 'the hot', 'the cold', 'the dry' and 'the wet', were generally conceived not so much as what we should call qualities, but as things – the sweet (or hot) substance or principle or element. Connected with these, in turn, there

were yet other doctrines based on one or more of the commonly recognized humours (*chymoi*: the primary meaning of the term is juice or flavour). The two most important of these were bile and phlegm, which play a particularly prominent part in pathological theories. Yet here again there was no agreement among the medical writers either about how many the principal humours were, or about their origin and role, for some writers maintained that they are natural or congenital, others that they are pathological, and some saw them as the causes, others as the products, of diseases.

Two examples will illustrate one type of pathological theory common in the Hippocratic Corpus. The author of the treatise called *Affections* (ch. 1) asserts: 'In men, all diseases are caused by bile and phlegm. Bile and phlegm give rise to diseases when they become too dry or too wet or too hot or too cold in the body'; and he goes on to say that such changes are brought about in a variety of ways, for example by food and drink, exercise, wounds, 'smell, hearing and sight', sexual intercourse, and 'the hot' and 'the cold' themselves. Again the treatise *Diseases* I (ch. 2) states: 'All diseases come to be, as regards things inside the body, from bile and phlegm, and as regards external things, from exercise and wounds, from the hot being too hot, the cold too cold, the dry too dry and the wet too wet. And bile and phlegm are formed in things as they come to be and they always exist, in greater or lesser quantities, in the body, and they bring about diseases, both those arising from food and drink and those from excess of hot and cold.'

As such examples indicate, Hippocratic statements concerning the origin of diseases often take the form of very sweeping generalizations indeed. Several writers develop complex doctrines covering not only the causes of diseases and the constituents of the body but other matters such as the cycle of the seasons, elaborating their theories far beyond their immediate relevance to the problems of the diagnosis and the treatment of disease. One of the most striking examples is in the work *The Nature of Man*. This begins (chs. 1–3) by refuting physical and physiological theories based on a single element, whether air, fire, water or earth, or again blood,

bile or phlegm. If there were only one element, the writer argues, generation would not be possible, nor would we experience pain. His own theory of what the body is composed of draws heavily on earlier philosophical ideas. Yet the synthesis he proposes is, in certain respects, more elaborate and comprehensive than any extant earlier system, notably in the correlations he suggests between the four primary opposites, the four basic humours and the four seasons. The basic constituent substances, in terms of which all physical bodies are to be analysed, are the hot, the cold, the dry and the wet. Thus 'each of the elements must return to its original nature when the body dies; the wet to the wet, the dry to the dry, the hot to the hot and the cold to the cold' (ch. 3). But the human body may be thought of as composed, in the first instance, of the humours blood, phlegm, yellow bile and black bile. As he writes in chapter 4: 'These are the things that make up its constitution and cause its pains and health. Health is primarily that state in which these constituent substances are in the correct proportion to each other, both in strength and quantity, and are well mixed. Pain occurs when one of the substances presents either a deficiency or an excess, or is separated in the body and not mixed with the others.' Moreover each of the humours is associated with one of the four seasons (blood, yellow bile, black bile and phlegm are said to predominate in turn in the body in the four seasons, spring, summer, autumn and winter respectively, ch. 7) and with two of the primary opposites, hot, cold, dry and wet. Thus yellow bile, like summer, is dry and hot. The doctrine is nothing if not neat and systematic, and one of the attractions of such theories is that they are so simple and yet so all-embracing. Certain empirical evidence is adduced and incorporated into the theory: for example, the writer mentions that phlegm is found to be cold to the touch and he refers to the effects of drugs that reveal the presence of humours in the body. But the theory is developed as an abstract schema, as a highly speculative, and would-be comprehensive, physical, physiological and pathological doctrine.

But while there are marked speculative tendencies in several

Hippocratic writers, others are strongly critical of those same tendencies. The most remarkable document in this respect is the treatise *Tradition in Medicine*. This castigates theorists who use what the writer calls hypotheses or postulates in the explanation of diseases, and he is especially critical of theories based on hot, cold, dry and wet in particular. His first quarrel with his opponents is that they narrow down the causes of diseases (ch. 1): 'They have supposed that there are but one or two causes; heat or cold, moisture, dryness or anything else they may fancy.' Again, medicine is an art in which there are both good and bad practitioners. It is not like such subjects as astronomy and geology which deal with 'invisible or problematic substances' and where, as he puts it, 'a man might know the truth and lecture on it without either he or his audience being able to judge whether it were the truth or not, because there is no sure criterion.' As for the hot and the cold and so on, the writer has this to say (ch. 15): 'I am utterly at a loss to know how those who prefer these hypothetical arguments and reduce the science to a simple matter of "postulates" ever cure anyone on the basis of their assumptions. I do not think that they have ever discovered anything that is purely "hot" or "cold", "dry" or "wet", without it sharing some other qualities.' Indeed (ch. 16) the hot and the cold are 'the weakest of the forces which operate in the body'.

Yet critical as he is both of theories based on hot, cold, wet and dry, and of the use of arbitrary postulates in general, the writer himself does not, of course, manage to do without certain assumptions in his own theories. Indeed his particular suggestions concerning the constituents of the body bear, we should say, obvious similarities to those that he had singled out for special condemnation. Admittedly his own doctrine is rather more complex in that he postulates a large number of constituent substances in the body. But he describes those substances as follows (ch. 14): 'There exists in man saltness, bitterness, sweetness, sharpness, astringency, flabbiness and countless other qualities having every kind of influence, number and strength. When these are properly mixed and compounded with one another, they can neither be observed

nor are they harmful. But when one is separated out and stands alone it becomes both apparent and harmful.' The writer wishes to exclude all 'postulates' from medicine, but himself employs assumptions similar in type to those he criticizes: indeed it is apparent that, at this period, *any* attempt at a general theory concerning the constituents of the body and the origins of disease was bound to be based on what might be described, in the writer's terms, as unverified hypotheses.

The Greek doctors had, and at this stage in the history of medicine could have, no knowledge of many of the causal factors relating to the conditions they encountered. In particular they had, of course, no conception of the role of micro-organisms in causing diseases. The theories they produced provided a framework into which could be fitted many of their observations, for example of temperature changes, of periodicities, and of discharges from the body. But their general pathological doctrines were all more or less speculative, and more or less arbitrary, conjectures. Yet as we have seen, disagreements among Greek medical writers related not only to first-order questions, concerning what the causes of diseases are, but also to second-order ones, concerning both the type of theory and the nature of the support required for it, and this provides important evidence of a growing interest in questions not just of medical, but of general scientific, method.

Among the medical writers who adopted a cautious and sceptical view of generalizations about the causes of diseases is the author of *Tradition in Medicine*. Although he is prepared to advance general theories himself, he recognizes that the science of medicine is inexact (ch. 9): 'One aims at some criterion as to what constitutes a correct diet, but you will find neither number nor weight to determine what this is exactly, and no other criterion than bodily feeling. Thus exactness is difficult to achieve and small errors are bound to occur. I warmly commend the physician who makes small mistakes; infallibility is rarely to be seen.' Doubt about how much the doctor can know is expressed by other writers too. In practice, the

principal problem that the doctors faced – whether or not they had a general pathological theory – was that of isolating the relevant factors in the diseases with which they had to deal. Even though there was as yet no technical vocabulary to draw the distinction between causal and coincidental factors, the medical writers are aware of the problem of distinguishing what is, and what is not, responsible for any given condition. Thus *Regimen* III (ch. 70) remarks that 'the sufferer always lays blame on the thing he may happen to do at the time of the illness, even though this is not responsible'. *Tradition in Medicine* notes more generally: 'Most doctors, like laymen, tend to ascribe some such event [a complication in a disease] to some particular activity that has been indulged in. In the same way they may ascribe something as being due to an alteration in their habits of bathing or walking or a change of diet, whether this is the actual case or not. As a result of jumping to conclusions, the truth may escape them' (ch. 21). Chapter 19 of the same work reveals one of the criteria that the writer assumes a cause must fulfil: 'The cause of these maladies is found in the presence of certain substances, which, when present, invariably produce such results.' Other treatises state such points as that 'every phenomenon will be found to have some cause' (*Science of Medicine*, ch. 6) or that 'each disease has a natural cause and nothing happens without a natural cause' (*Airs, Waters, Places*, ch. 22); some recognize that a similar effect can be brought about by different causes (for example, *Regimen in Acute Diseases*). Greek thought on the topic of physical causation was, in general, slow to develop, only gradually building up a vocabulary of terms that were usually derived from the sphere of human responsibility and that in many cases retained their social or even political associations. Thus before *aitia* came to be used generally in the sense of 'cause', it meant responsibility or blame, and the meaning of *to aition* is equivalent to 'that which is responsible'. When the Hippocratic authors write of *dynameis* at work in the body, the term sometimes retains some of the sense of 'political power' alongside that of 'physical force' – as we can judge from its use in conjunction with other cognate terms such as *dynasteuō*

(reign), in which the political connotation clearly predominates.* So far as the inquiry into nature is concerned, it so happens that both the distinction between cause and coincidence, and the idea that every effect has a cause, are first clearly expressed in medical writers, and although we should make due allowance for the fact that much more fifth century medicine than fifth century cosmology has been preserved, it is clear that the investigation of diseases provided one of the chief contexts in which Greek ideas on physical causation developed.

When first called in to a case, the doctor aimed, as we have seen before, to give a 'prognosis' covering the past, present and future of the disease. Although the doctor may well have named the condition he thought the patient was suffering from, he no doubt concentrated, in practice, less on giving the patient a theoretical explanation of the cause of the disease than on the question of its outcome and particularly on the chances of recovery. There can be no doubt, however, that the Greeks held that the prognosis should be based on a very thorough examination of the patient. In *Prognosis*, which is particularly concerned with 'acute' diseases, that is those accompanied by high fever such as pneumonia or malaria, the writer gives detailed instructions about how the doctor should proceed. First he should examine the patient's face, for example the colour and texture of the skin, and especially the eyes, where he should consider whether 'they avoid the glare of light, or weep involuntarily', whether 'the whites are livid', whether the eyes 'wander, or project, or are deeply sunken', and so on. He should also inquire how the patient has slept, about his bowels and his appetite: he should take into account the patient's posture, his breathing and the temperature of the head, hands and feet, and separate chapters are devoted to how to interpret the signs to be found in the patient's stool, urine,

*E.g. *Tradition in Medicine*, ch. 16. The relation between different factors in the body was often conceived with the help of political metaphors or images, especially that of the balance of power; this image goes back to Alcmaeon, who is reported to have held that health lies in the *isonomia* or equal rights of certain powers (*dynameis*) in the body.

vomit and sputum. The one notable absentee from the list of things the doctor should consider is the pulse. Although the phenomena of pulsation, throbbing and palpitation are referred to by Hippocratic writers, the value of the pulse in diagnosis was not appreciated until after the date of most of the Hippocratic treatises. The first person to restrict the pulse to a distinct group of vessels, the arteries, and to recognize that it can be used as an indicator of disease was Praxagoras of Cos, working about 300 B.C.

Another detailed account of the factors that the doctor should consider in diagnosing appears in *Epidemics* I (ch. 23), a passage that is worth quoting at length. After saying that one should take into account 'the nature of man in general and of each individual and the characteristics of each disease', the writer proceeds:

> Then we must consider the patient, what food is given to him and who gives it . . . , the conditions of climate and locality both in general and in particular, the patient's customs, mode of life, pursuits and age. Then we must consider his speech, his mannerisms, his silences, his thoughts, his habits of sleep or wakefulness and his dreams, their nature and time. Next, we must note whether he plucks his hair, scratches or weeps. We must observe his paroxysms, his stools, urine, sputum and vomit. We look for any change in the state of the malady, how often such changes occur and their nature, and the particular changes which induce death or a crisis. Observe, too, sweating, shivering, chill, cough, sneezing, hiccough, the kind of breathing, belching, wind, whether silent or noisy, haemorrhages and haemorrhoids. We must determine the significance of all these signs.

Equally striking is the evidence provided by the case-histories in this and the other books of *Epidemics* showing how some Greek doctors put these principles into practice. The case-histories (three groups of which are included in our selection, pp. 102–12, 113–21 and 127–38) contain day by day records of the progress of individual patients' conditions. The entry under each day varies from a single remark to a lengthy description of some nine or ten lines, and in some cases occasional observations continue to be recorded up to the 120th

day from the onset of the disease. The primary aim of these case-histories is to provide as exact a record as possible of the cases investigated: they contain few interpretative comments and no overall theory of diseases is stated in them. Yet the terms used in the descriptions are, of course, in many cases 'theory-laden', and they reveal certain assumptions concerning the nature and causes of diseases. Thus although *Epidemics* I and III present no schematic doctrine of humours – such as we have in *The Nature of Man*, for example – they often refer to 'bilious' and 'phlegmatic' matter in the patients' discharges. Again they adopt the common Greek view that the course of 'acute' diseases, especially, is determined by 'critical days', when marked changes take place in the patient's symptoms, and this doctrine of critical days must be recognized as one of the main motives for carrying out and recording *daily* observations. The 'constitutions' that accompany the case-histories suggest general conclusions concerning the periodicities of crises, notably concerning the regular occurrence of paroxysms and crises on either the odd, or the even,* days as numbered from the outset of the disease. Indeed in some places (for example *Epidemics* I, ch. 26) there are elaborate schemata concerning these periodicities, although elsewhere the difficulty of generalization and the variety in the courses and outcomes of diseases are remarked. The case-histories are models of painstaking and systematic observation. But these descriptions clearly reflect the writers' theoretical assumptions and interests, and not surprisingly modern clinicians have, in many cases, found it impossible to identify, on the basis of these accounts, what the patients were suffering from.

*The idea of the importance of the distinction between odd and even days has, in one form or another, proved exceptionally long-lived. My father tells me that as a medical student at St Bartholemew's in the early 1920s he was taught to watch for the crisis in pneumonia on the uneven days, especially the seventh, and in the sixteenth edition of William Osler's *The Principles and Practice of Medicine* (ed. H. A. Christian, New York and London, 1947, p. 49) it is remarked that 'from the time of Hippocrates it [the crisis in pneumonia] has been thought to be more frequent on the uneven days, particularly the fifth and seventh; the latter has the largest number of cases (Musser and Norris).'

Even more than their views on the conduct of a clinical examination, the theories that the Greek doctors adopted concerning treatment and cure are influenced by their pathological doctrines. The commonest theory, derived no doubt from popular beliefs but expressed as a general doctrine in several Hippocratic texts, is that opposites are a cure for opposites. Thus *Breaths* states that proposition baldly in its opening chapter. *Places in Man* (ch. 42) says that 'pains are cured by their opposites'. And *The Nature of Man* (ch. 9) puts it as follows: 'Diseases caused by overeating are cured by fasting; those caused by starvation are cured by feeding up. Diseases caused by exertion are cured by rest; those caused by indolence are cured by exertion. To put it briefly; the physician should treat disease by the principle of opposition to the cause of the disease according to its form, its seasonal and age incidence, countering tenseness by relaxation and *vice versa*. This will bring the patient most relief and seems to me to be the principle of healing.'

Elsewhere, however, doubts and criticisms are expressed concerning the application of certain theories of this type in practice. The writer of *Tradition in Medicine* attacks those who based their theories on hot, cold, dry and wet particularly on this score. In chapter 13 he suggests that they should consider the case of a man of weak constitution who has fallen sick through eating unsuitable food such as uncooked wheat and meat. 'What remedy, then,' he asks, 'should be employed for someone in this condition? Heat or cold or dryness or wetness? It must obviously be one of them because these are the causes of disease, and the remedy lies in the application of the opposite principle according to their theory.' Later (ch. 15) he has this to say of his opponents: 'Rather, I fancy, the diets they prescribe are exactly the same as those we all employ, but they impute heat to one substance, cold to another, dryness to a third and wetness to a fourth. It would be useless to bid a sick man to "take something hot". He would immediately ask "What?" Whereupon the doctor must either talk some technical gibberish or take refuge in some known solid substance.' These are forceful criticisms. Yet, as is clear from the

writer's own use of the pair 'overeating' and 'undernourishment' in chapters 9 and 10, his objection is not so much to the principle that opposites should be countered by opposites, as to the particular opposites, 'hot', 'cold', 'dry' and 'wet', that his opponents referred to.

As these examples show, some theories of treatment were highly schematic and dogmatic. Once again, however, we must do justice to the variety of different points of view represented among the Hippocratic writers. While some treatises, such as *The Science of Medicine* (e.g. ch. 11), confidently proclaim that all diseases are in principle curable, other works adopt a much more cautious and pragmatic approach. The difficulty of effecting a cure, indeed the helplessness of the doctor, are often expressed. In the case-histories in *Epidemics* III, for instance, we read: 'It was impossible to do anything to help her; she died' (case 9, first series); and again: 'No treatment which he received did him any good' (case 5, second series); and in the 'constitution' in the same book (ch. 8): 'This condition responded only with difficulty to medicines, and in most cases purgatives did additional harm.' The philosophy of *Epidemics* I is expressed in chapter 11: 'Practise two things in your dealings with disease: either help or do not harm the patient.'

The dangers of doing positive harm to the patient with the wrong treatment are frequently referred to. Thus *Regimen in Acute Diseases* (ch. 26) notes with disapproval the theory of some doctors that when a violent change takes place in the body, it must be countered with another violent change: 'I know that physicians do the exact opposite of what is correct.' From the *Aphorisms* (Sec. VI, ch. 38) we may note: 'It is better not to treat those who have internal cancers since, if treated, they die quickly; but if not treated they last a long time.' The surgical treatises, especially, repeatedly criticize incorrect or harmful treatment. From among some two dozen such passages, we may mention two. Chapter 25 of *Fractures* comments as follows on incorrect bandaging in fractures: 'Then there are others who treat such cases at once with bandages, applying them on either side, while they leave a

vacancy at the wound itself and let it be exposed. Afterwards, they put one of the cleansing applications on the wound, and treat it with pads steeped in wine, or with crude wool. This treatment is bad, and those who use it probably show the greatest folly in their treatment of other fractures as well as these . . . ' And the writer is especially indignant that, despite the harmful effects of such treatment, the doctors in question persist in treating other cases in the same way: 'They finally take off the dressings, when they find there is aggravation, and treat it for the future without bandaging. Yet none the less, if they get another wound of the same sort, they use the same treatment, for they do not suppose that the outside bandaging and exposure of the wound is to blame, but some mishap.' The other major surgical treatise, *Joints*, has this to say concerning the harmful effects of treating dislocation of the shoulder incorrectly with cauterization: 'I know of no one who uses the correct treatment, some not even attempting to take it in hand, while others have theories and practices the reverse of what is appropriate. For many practitioners cauterize shoulders liable to dislocation at the top and in front where the head of the humerus forms a prominence, and behind a little away from the top of the shoulder . . . Now these cauterizations rather bring it about than prevent it, for they shut out the head of the humerus from the space above it' (ch. 11).

In practice, the methods of treatment mentioned in the Hippocratic Corpus consist of a very few general types. The most important are surgery (especially the treatment of fractures and dislocations, but including also the use of the knife, trephining and cautery), blood-letting, the administration of purges, emetics and suppositories, baths, fomentations, ointments and plasters, and, especially, the control of regimen – diet and exercise.* The Greek doctors had, of course, no

*These general methods as such were not original to the Hippocratic authors, and certainly so far as the use of drugs, ointments and plasters goes, these remained on the whole comparatively simple: we have nothing in the Hippocratic Corpus to set beside the complex preparations described at length in, for example, Galen. On the other hand certain developments did, it seems, take place in the fifth and fourth centuries in both surgery and dietetics. In the latter, especially, the Hippocratic

antibiotics, and no reliable anaesthetic or antiseptic agents. Ideas of nursing and of hygiene were primitive. Most patients – and all bed-ridden cases – were treated in their own homes, cared for by their relatives. Although in later antiquity we can find precursors to the modern hospital both in the Roman military *valetudinaria* or sick-bays and in civilian institutions of the early Byzantine period, such as that founded by St Basil at Caesarea in the mid fourth century A.D., nothing of the kind existed in the time of the Hippocratic writers.

The author of *Decorum* recommends both that the doctor should make frequent visits, and that he should leave one of his pupils, not a layman, in charge of the patient in his absence, but how well these recommendations were carried out, we do not know. Again, although baths were occasionally prescribed, this was as part of a particular course of treatment, not as a routine measure of hygiene, and in general the importance of cleanliness was little appreciated. In the treatise that describes the doctor's surgery or consulting-room (*The Surgery*), more attention is paid to the room being well lit than to its being clean. Indeed although the need for bandages to be clean is noted, the need for the room itself to be kept clean is not, although the writer covers such other detailed points as the correct length of the surgeon's fingernails.

The recommendations not to harm the patient must, then, be understood against this background. Few remedies were available, and some of these were drastic ones. We have no reason to disbelieve the Hippocratic doctors when they observe that many commonly used treatments did more harm than good. This applies to blood-letting, cautery, the pre-

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writers sometimes worked out extremely elaborate regimens for the healthy as well as for the sick. The surgical treatises refer to the use of some complex apparatus, especially for reducing dislocations and including the famous Hippocratic Bench, described at *Joints* chs. 72–3 (cf. *Fractures*, ch. 13), but the attitudes of the authors are ambivalent. Thus the writer of *Joints* praises those who invent devices that are 'in accordance with nature' (ch. 42), but he criticizes his colleagues for using marvellous methods in order to impress their clientèle (chs. 42 and 44) and he insists that where two methods achieve the same result, the simpler is to be preferred (ch. 78).

scription of a sudden change of diet and the use of potent drugs such as black hellebore (the dangers of which are remarked, for instance, in the *Aphorisms*, Sec. IV, ch. 16). In the circumstances, caution and a pragmatic approach were clearly in order: the doctor started with a mild treatment and continued or modified it according to the patient's response. For some conditions, Hippocratic treatments were, we may believe, effective enough. Thus the account of how to treat dislocations and fractures in the surgical treatises is, on the whole, very sound. But for many other complaints, and particularly for the acute diseases to which they devote so much of their attention, the Hippocratic doctors could do little more than let nature take its course, keeping the patient as comfortable as possible and doing nothing to exacerbate his condition, but with little hope that the diet or drugs prescribed would bring about a cure.

MEDICINE, EDUCATION AND SCIENCE

The technical or 'professional' training of the Hippocratic doctor was both far less extensive and less clearly defined than that of his modern counterpart. Conversely it was easier and commoner for men who had no practical experience of medicine to interest themselves in matters that would nowadays be deemed the province of the qualified doctor. Educated laymen and experts, when they could be distinguished at all, certainly had no problems in communicating with one another. From the fifth century B.C. onwards, there is evidence of a quite widespread interest in various aspects of medicine and medical theory outside the circles of those who actually practised as doctors. This may be seen as part of the more general phenomenon of the expansion of both 'higher' and 'technical' education in that period, associated with, but not confined to, the rise of the professional teacher or sophist. Several of the Hippocratic treatises are, as we noted, lectures addressed to a general audience. Indeed some, such as the work called *Breaths* and perhaps also *The Science of Medicine*, were composed by men who were professional lecturers, rather than professional

doctors, if one may distinguish between these two activities while recognizing that many individuals engaged in both.

A remarkable passage in *The Nature of Man* shows that even quite technical subjects were lectured on in public to a general audience. This treatise begins by explaining that 'this lecture is not intended for those who are accustomed to hear discourses which inquire more deeply into the human constitution than is profitable for medical study. I am not going to assert that man is all air, or fire, or water, or earth . . .' The author is outspoken in his criticisms of those who indulge in such theorizing: they do not know what they are talking about. 'A good illustration of this is provided by attending their disputations when the same disputants are present and the same audience; the same man never wins the argument three times running, it is first one and then the other and sometimes the one who happens to have the glibbest tongue.' The implication is that the question of the ultimate constituents of the human body was, at this time, the subject of competitive public debates in which several speakers participated and the audience itself decided who was the winner.

Further evidence of the general interest in certain aspects of medicine outside the doctors comes from Aristotle. In the *Politics* (1282a 3ff.) he distinguishes between three kinds of persons who have a claim to speak on medical matters: first the ordinary practitioner, second the 'master-craftsman', and third the man 'who is educated in the art', that is, the man who has studied medicine but does not necessarily practise it. Elsewhere Aristotle (himself the son of a doctor) points out the relevance of the study of health for the inquiry concerning nature in general. It is the business of the student of nature (*physikos*), he says in the *De sensu* (436a 17ff.), 'to inquire into the first principles of health and disease . . . Generally, then, most of those who study nature end by dealing with medicine, while those of the doctors who practise their art in a more philosophical manner take their medical principles from nature.' And he makes a similar point in the *De respiratione* (480b 26ff.): 'The more subtle and inquisitive doctors speak about nature and claim to derive their principles from it, while the more

accomplished investigators of nature generally end by a study of the principles of medicine.'

The place that the study of medicine might occupy in the interests of others besides the doctors can be illustrated by the fact that a philosopher such as Plato gave a detailed, six-page account of the origins of diseases in his cosmological dialogue, the *Timaeus*. Admittedly many modern scholars largely or even wholly discount Plato's efforts to give an account of the physical world in that dialogue. Yet to this two remarks must be made. Firstly, the *Timaeus* must be taken seriously in this respect at least, that Plato was deeply concerned to show the element of order and design in the cosmos, which he believed to be the best possible; as he puts it at *Timaeus* 92c, it is a 'perceptible god, greatest and best and fairest and most perfect'. Secondly, whatever modern scholars may think of the account of diseases in particular – and it must be agreed to be very largely derivative – it evidently impressed some ancient commentators. In the papyrus Anonymus Londinensis, that preserves parts of Meno's history of medicine written probably at the end of the fourth century B.C., more space is devoted to Plato than to any other theorist, including Hippocrates. Even when we make due allowance first for the fragmentary nature of the papyrus itself and then for the special attention paid to anything Plato wrote, it is clear that the physiological and medical doctrines of the *Timaeus* commanded considerable respect in the fourth century. Nor should we be surprised at this, or by the space that Plato devoted to the problem of disease in the *Timaeus*, when we recall that other writers, too, whose theories are known to us from Meno or from other sources, had many other interests besides medicine. Thus the Pythagorean Philolaus of Croton, whose doctrines are reported at Anonymus Londinensis XVIII, 8ff., worked in a variety of fields, including astronomy and geometry. And in the next century Aristotle refers on several occasions to a discussion of health and disease – which shows that he at least planned such a work, although if he wrote it it has not survived.

Medicine was, then, sometimes included in the study of

nature, and as such could be, and was, investigated by men who styled themselves philosophers rather than doctors. Moreover the relation between medicine and the rest of the study of nature was a subject of dispute. Aristotle's views on this have already been noted. From the medical writers we may cite two sharply opposed opinions. The author of *Regimen* I subordinates dietetics, at least, to physiology. In chapter 2 he writes: 'I maintain that he who intends to write correctly concerning the regimen of man must first know and discern the nature of man in general, that is know from what things he is originally composed, and discern by what parts he is controlled', and later he demands that the doctor should know such matters as the risings and settings of the stars, in order to be able to guard against the 'changes and excesses' of 'foods and drinks and winds and the whole cosmos from which diseases come to men'. The position adopted in *Tradition in Medicine* is the antithesis of this. This treatise draws a fundamental distinction between medicine and such subjects as astronomy and geology in chapter 1 (see above p. 27), and in chapter 20 the writer claims not merely that medicine is independent of philosophy, but that so far from medicine being subordinate to 'physics', the reverse applies and the study of nature in general should be approached through the study of medicine.

> I think I have discussed this subject sufficiently, but there are some doctors and sophists who maintain that no one can understand the science of medicine unless he knows what man is; that anyone who proposes to treat men for their illnesses must first learn of such things. Their discourse then tends to philosophy as may be seen in the writings of Empedocles and all the others who have ever written about Nature; they discuss the origins of man and of what he was created . . . I do not believe that any clear knowledge of Nature can be obtained from any source other than a study of medicine and then only through a thorough mastery of this science.

In attempting to determine the role of medicine in the development of ancient natural science we must first recall that the conceptual categories that the Greeks employed to refer to what we term 'science' and 'philosophy' are, in certain

respects, quite different from our own. There was no category of 'science' as such at all, and 'philosophy' could include not only ethics and logic, but also *physikē*, a category much wider than our 'physics' since it comprised the whole of the inquiry concerning nature. In many cases the ideas and doctrines of the medical writers run parallel to those of the philosophers and form part of the same general development in the study of nature. One example that has already been mentioned concerns causation: the investigation of the factors responsible for a disease – or for an improvement in a patient's condition – helped to focus attention on the distinction between a cause and a coincidence, and several medical writers insist that every phenomenon has a cause. If at the very beginning of scientific inquiry the rejection of mythological explanations is an important, even if negative, step, one of the best extant examples of this from early Greek science is the treatise *The Sacred Disease*, which brings a powerful set of arguments to bear to refute the view that the sacred disease is subject to divine intervention. There can be no question, the writer argues, of the sacred disease *not* having a natural cause just like every other disease, and he offers his own explanation of its origin, namely that it arises from a phlegmatic discharge that blocks the vessels communicating with the brain. Indeed taking the war into his enemies' camp he maintains that it is positively impious to suggest that any divine agency would be responsible for this or any other sickness. As for the remedies that the quacks used, 'purifications', 'sanctifications' and the like, he dismisses these as so much chicanery: 'They also employ other pretexts', he says (ch. 2), 'so that, if the patient be cured, their reputation for cleverness is enhanced while, if he dies, they can excuse themselves by explaining that the gods are to blame while they themselves did nothing wrong.'

But if the work of the doctors was often solidary with that of the philosophers, the opposition between *some* medical writers and *some* philosophers was also fruitful for Greek science. From the point of view of the development of Greek science as a whole, those who wrote chiefly on medical subjects made fundamental contributions in three main areas

especially. Firstly, in the great epistemological debate on the foundations of knowledge and the relative trustworthiness of reason and sensation, some of the medical writers not only insist on the importance of observation in principle, but also provide, in practice, some remarkable examples of sustained and meticulous observation. Secondly, there is the growing recognition, during the fifth and fourth centuries, of the distinctions between different intellectual disciplines and, connected with this, a growing awareness of methodological issues. Here too important contributions are made by medical writers, particularly by the author of *Tradition in Medicine*. Thirdly, in the growing discussion of the relative importance of theoretical knowledge and its practical applications, some of the medical writers – again in contrast to some philosophers – stood firmly for the principle that what counted in medicine was the latter.

The first point concerns the use of observation. Early Greek science as a whole has often been criticized as excessively rational and dogmatic, and the criticism has a good deal of force. Certainly in the debate between reason and sensation some of the philosophers not only argued that reason is to be preferred, but also tended positively to denigrate sensation. The first to do so was Parmenides in the early fifth century, and this tradition finds its most notable exponent in Plato, although immediately after him Aristotle goes out of his way, particularly in his biological works, to defend and support the practice of observation. Dogmatism is undoubtedly a marked feature of much of Greek medicine as well as of early Greek philosophy. Yet it is in medicine that we find the best early examples of systematic and meticulous observation. As we have noted, several works insist that prognosis must be based on a very thorough examination of the patient, and the case-histories in the *Epidemics* show that some of the doctors were capable of carrying out detailed and sustained observations.

Secondly, we have seen that in one text especially, *Tradition in Medicine*, methods are explicitly discussed at some length, the two most important ideas being (1) the recognition of the inexactness of medicine, and (2) the rejection of theories based

on untestable 'postulates' or 'hypotheses'. Putting these points now into the wider perspective of the development of Greek natural science as a whole, we may note that they represent the first attempt to establish distinctions between the methods of different inquiries. The early history of the use of hypotheses is obscure and controversial. The Greek term *hypothesis* itself is used only rarely in the sense of 'assumption' or 'hypothesis' before Plato. Indeed when Plato first introduces it in the *Meno* (86e ff.), he feels it necessary to explain it by referring to the practice of geometers. In geometry, a proof is undertaken by means of a 'hypothesis' when it is first agreed that if a certain condition is fulfilled, the required conclusion follows, whereas if not, the conclusion does not: and attention is then devoted to considering whether the condition in question is satisfied. 'Hypothesis' had, then, it seems, a fairly technical use in the context of mathematics (where it resembles the argument later known as analysis), although the lack of first-hand evidence about Greek mathematics before Plato precludes our saying precisely when that use was first developed, and it is not clear in particular whether it was known to the author of *Tradition in Medicine*.

What is remarkable, however, is that *Tradition in Medicine* already attacks the use of 'hypotheses' in general. He mentions their applications to obscure and problematic subjects such as astronomy and geology, but it is not the case that he approves of their use even there. On the contrary, the fact that those studies have to make use of some hypothesis is enough to condemn them in his eyes. His objection is a general one, to the use of any unwarranted assumption, any assumption for which there is, in his own words, 'no sure criterion'. We have commented on the apparent discrepancy between the writer's own practice in the physiological and pathological doctrines he puts forward, and the methodological recommendations in chapter 1. But that does not diminish the importance of those recommendations as the first, admittedly imprecise, statement that arbitrary assumptions should be excluded and that theories should be testable.

Furthermore, while this writer makes explicit a demand that

there should be a criterion, other Hippocratic authors too refer to how particular ideas work out in practice, if not in the context of their general physical doctrines, at least in that of theories of treatment. Again Greek science as a whole has been criticized – with some justification – for the lack of attention paid to practical applications of theoretical ideas. Certainly among the philosophers we find both Plato (e.g. *Republic* 527d ff.) and Aristotle (e.g. *Metaphysics* 981b 17ff.) arguing for the superiority of theoretical to practical branches of knowledge. But again some of the medical writers provide something of an exception by their evident interest in the practical consequences of different medical ideas in the actual day to day treatment of the sick.

The dominant concerns of the medical writers were those of establishing the causes of diseases, of prognosis and of treatment. Most of their main physical doctrines were, as we have seen, heavily influenced by those of the philosophers; the knowledge of physiological processes, and even of basic anatomy, in the medical writers was often rudimentary. Thus digestion, like disease, was often viewed in terms of a struggle between opposed powers, in which the stomach had to overcome the food by cooking or 'concocting' it, or the food was thought of as absorbed into the body by a process of the assimilation of 'like' substances to their like. Again ideas about the movement of different substances in the body were generally extremely vague. Thus *The Sacred Disease* represents air, which the author believes is responsible for consciousness and intelligence, as being in constant movement through the body. The air we breathe in through the mouth and nose passes first to the brain and 'then the greater part goes to the stomach' (to cool it), 'but some flows into the lungs and blood-vessels' (ch. 10); and, as noted, the author explains the cause of the sacred disease as the obstruction, by phlegm, of the air in these vessels. The accounts the Hippocratic writers give of the main blood-vessels in the body are highly schematic and are often directly related to, when not simply derived from, current practices in venesection. Thus *The Nature of Man* (ch. 11)

contains a description of four main pairs of blood-vessels, the first of which 'runs from the back of the head, through the neck, and, weaving its way externally along the spine, passes into the legs, traverses the calves and the outer aspect of the ankle, and reaches the feet'. Whereupon the writer adds: 'Venesection for pains in the back and loins should therefore be practised in the hollow of the knee or externally at the ankle.' The vagueness of early Greek ideas on this subject is reflected in their terminology. Although certain Hippocratic works draw some distinction between *phlebes* and *artēriai*, these terms do not coincide with our 'veins' and 'arteries'. *Artēria* was regularly used, for example, of the principal ducts of the respiratory tract, the windpipe and the bronchi (our term trachea comes from the Greek name for that duct *hē tracheia artēria*, literally 'the rough artery'); *phlebes*, while generally used of blood-vessels, whether veins or arteries, was not confined to vessels that carry blood and/or air.

One special area which was the subject of more concentrated inquiries and speculation was the problem of generation, including the origin of sex differentiation and heredity. The problems are alluded to in several treatises, but one group in particular attempts a more systematic discussion. These are the embryological treatises, *The Seed*, *The Nature of the Child* and *Diseases* IV (the first two are included in this selection), which were almost certainly by the same writer and may have been originally composed as a unity. Many of the basic ideas in these three works are not original. Thus the writer puts forward a version of the four-humour theory in chapter 3, where he identifies four kinds of innate bodily fluid, although where *The Nature of Man* for instance gives black bile as the fourth humour, along with bile, blood and phlegm, *The Seed* gives water. The writer also attaches importance to the process of the assimilation of 'like' substances to one another, and this too was a common idea. Nor is the fundamental notion that underlies his explanation of heredity likely to be original. He holds that the seed is drawn from every part of the body: it contains something of, and so can reproduce, every part. But

this theory, the so-called 'pangenesis' doctrine, was very probably first put forward by the fifth-century atomist philosopher Democritus.

Nevertheless two features of the treatment of the problem of generation in the embryological treatises are of particular interest, first the attempt at empirical research, and second the use of analogies. In chapter 29 of *The Nature of the Child* we have the first extant reference to detailed observations of the growth of an embryo chick. 'If you take twenty or more eggs and place them to hatch under two or more fowls, and on each day, starting from the second right up until the day on which the egg is hatched, you take one egg, break it open and examine it, you will find that everything is as I have described – making allowance of course for the degree to which one can compare the growth of a chicken with that of a human being.' The account is extremely brief (when Aristotle undertook a similar inquiry in the *Historia Animalium*, VI, ch. 3, his description was much fuller) and how much the writer learned from his observations is hard to say – he uses them merely to support the view that 'the seed is contained in a membrane which has an umbilicus in the centre' and to show that there are membranes extending from the umbilicus. Nevertheless the important point is that the idea of conducting such an investigation had occurred. Once again we should remember, in the background, the controversy on the relative merits of reason and sensation. While many ancient embryologists were content to arrive at their theories chiefly or even solely by the use of abstract argument, this author, at least, recognized the need not merely to open an egg to see what he could see, but to conduct a comparatively sustained set of observations.

In his attempt to tackle the major problems connected with generation, the writer's main tool is analogy. The three treatises contain a wealth of comparisons of varying complexity. One of the simpler ones is the comparison in *The Nature of the Child* (ch. 12) between the formation of a membrane round the seed in the womb and the formation of a membraneous surface on bread as it is cooked. Two types of analogies are particularly common, those with mechanical processes and those with

plants. In chapter 17 of *The Nature of the Child*, the author illustrates his doctrine that like substances go to like, under the action of breath or air, by comparison with the behaviour of earth, sand and lead filings when placed in a bladder and covered with water. If you insert a pipe into the bladder and blow into it, he claims, 'first of all the ingredients will be thoroughly mixed up with the water, but after you have blown for a time, the lead will move towards the lead, the sand towards the sand, and the earth towards the earth. Now allow the ingredients to dry out and examine them by cutting around the bladder: you will find that like ingredients have gone to join like.' *Diseases* IV (ch. 39) provides another example where the writer illustrates a highly conjectural theory concerning a physiological process by citing an analogy with a comparatively simple mechanical one. There he describes setting up an arrangement of three or more vessels on a piece of level ground. The vessels are joined with communicating pipes and the writer remarks that if water is poured into one of the vessels, it finds the same level in the others, and that the system as a whole can be filled or emptied by filling or emptying one of the vessels. But this comparison is then used to suggest that 'the same thing happens in the body'. The writer maintains that 'in the same way' the humours travel between the different 'sources' in the body, that is the stomach, heart, head, spleen and liver.

Plant analogies too serve a similar role in suggesting, and supporting, theories on a variety of obscure topics. *The Seed* (ch. 9) suggests a comparison with the way in which, when a cucumber is grown in a vessel, the shape and size of the cucumber are determined by those of the vessel – in order to support the theory that the shape and size of the embryo are influenced by those of the womb. In the next chapter the writer further illustrates his view that the embryo may become deformed when constricted in the womb by comparison with a tree: 'A similar thing happens to trees which have insufficient space in the earth, being obstructed by a stone or the like. They grow up twisted, or thick in some places and slender in others, and this is what happens to the child as well, if one part of the

womb constricts some part of its body more than another.' Then in *The Nature of the Child* (chs. 22–27) there is a long digression on the growth of plants which is used to suggest that the womb stands in the same relation to the embryo as the earth to the plants that grow in it, and which ends (ch. 27): 'Now it is in just the same way that the child in the womb lives from its mother, and it is on the condition of health of the mother that the condition of health of the child depends. But in fact, if you review what I have said, you will find that from beginning to end the process of growth in plants and in humans is exactly the same.'

Analogies were employed extensively from the very beginnings of Greek science,* and during the fifth and fourth centuries their use develops, becoming both more elaborate and more self-conscious. The philosopher Anaxagoras, for instance, stated the principle that 'phenomena' – that is, things we can see – should be used as a 'vision' of 'what is unclear', and although this dictum covers more than the use of analogy, it certainly includes it. Although the embryological treatises do not refer explicitly to Anaxagoras, the writer would no doubt have agreed with him and approved his principle as a way of investigating the hidden internal functionings of the body. The frequency with which analogies of different kinds are proposed, and the elaborate character of those that refer not just to well-known facts but to observations of the behaviour of substances in special, artificial conditions, are remarkable and suggest a deliberate method of procedure on the writer's part. Of course the method of analogy suffers from serious limitations. First there is the danger of mistaking an analogy for a demonstration. Second there is the temptation to ignore the negative analogy – the points of difference between the things compared – though we find some recognition in the embryological treatises that certain analogies, such as that between the chick and the human embryo, are not exact. And conversely the positive analogy (or points of similarity) may be, and often is, overestimated:

*Their use is discussed in part 2 of my *Polarity and Analogy*, Cambridge, 1966.

sometimes, indeed, when the comparison is between what is known and what is completely unknown, the suggestion that there is some similarity between the two may be a matter of pure conjecture. Nevertheless the method can be, and often was, extremely fruitful in suggesting, if not in establishing, hypotheses. In the investigation of vital processes within the body it was often impracticable or quite impossible to carry out direct observations, let alone experiments. In these circumstances, drawing a comparison with what can be observed outside the body provides a means of bringing empirical data to bear on the problem, and in some cases in the embryological treatises the comparisons involved conducting simple tests on substances outside the body. The fact that analogies were often used uncritically (a feature that is not confined, of course, to their use by the ancient Greeks) should not cause us to underestimate their importance as a method of discovery, especially in the investigation of problems beyond the reach of direct observation.

Finally, having noted the comparative lack of interest in internal anatomy shown by most Hippocratic writers, we must mention the one treatise that is the exception to this general rule. This is *The Heart*, a work which is also exceptional in its date: as already noted, it may well belong to the third century. Parts of the work are very obscure and the writer adopts some extremely speculative doctrines, such as the notion that man's intelligence resides in the left chamber of the heart. Yet he gives a quite detailed account of the anatomy of the heart. He describes it as a 'strong muscle' and distinguishes the 'ears' – that is the auricles and atria – noting in chapter 8 that they do not contract simultaneously with the ventricles but have a separate movement of their own. Then in chapters 10–12 he describes the 'hidden membranes' of the heart, identifying the semi-lunar valves at the base of the aorta and the pulmonary artery and perhaps also (though here text and interpretation are more problematic) the atrio-ventricular valves. Thus on the semi-lunar valves he writes (ch. 10): 'Now there is a pair of these arteries, and on the entrance of each three membranes have been contrived,

with their edges rounded to the approximate extent of a semicircle. When they come together it is wonderful to see how precisely they close off the entrance to the arteries.'

Unlike most of the Hippocratic treatises, which make little or no use of dissection, the account of the heart in this work clearly depends on it. The method was first used extensively on animals by Aristotle, and although the point is disputed, there seems no good reason to deny what Celsus (among others) reports, namely that the Hellenistic biologists Herophilus and Erasistratus dissected human beings – although how extensive their dissections were is, to be sure, a matter of doubt. The works of Herophilus and Erasistratus themselves are lost, and we have to rely on quotations preserved in such later writers as Rufus and Galen. Whether or not *The Heart* is directly influenced by Erasistratus (who is credited by Galen with the discovery of the valves of the heart), it provides valuable direct evidence concerning the advances in anatomical knowledge that stemmed from the use of dissection in the third century. At the same time, we cannot but be struck by the contrast between this work and the rest of the Hippocratic treatises, where an interest in anatomy was generally confined to matters directly related to treatment.

Few, if any, of our anonymous Hippocratic authors can be considered great original scientists. Yet the contributions these treatises made to the development of Greek natural science are far from negligible. In particular, they provide important evidence concerning a strain of Greek science that, while owing much to the philosophers, also criticized and opposed them, whether implicitly or explicitly, both at the level of individual theories and on the questions of general methods and aims. Although we find plenty of schematic speculation in the medical writers, too, they differed from the philosophers in this respect especially, that they combined theoretical with practical interests: their chief preoccupation was with diagnosis and treatment and their primary aim was to succeed in combating disease and restoring or preserving health. They were conscious, and proud, of the fact that medicine was a *technē*, an art, which could be judged by results and in which

there were – as many writers were keen to point out – both good and bad practitioners. Their knowledge of physiology and anatomy was generally rudimentary and in many cases their ideas were soon outdated. But in other areas the work they did set a high standard: the two outstanding examples are the account of the treatment of fractures and dislocations in the surgical treatises and the case-histories in the *Epidemics*. Indeed in the latter case the standard of detailed and meticulous observation remained unsurpassed not only throughout antiquity but down to the sixteenth century.

HIPPOCRATES' REPUTATION AND INFLUENCE

The history of the reputation of Hippocrates is, from the early third century B.C., very largely one of the development of, and changes in, an ideal. Once a body of medical writings had been collected together and associated with the name of the man who had been the subject of such complimentary references in both Plato and Aristotle, Hippocrates' fame inevitably eclipsed that of all other early doctors, and he came to stand for whatever any given writer held to be most valuable in early medicine. He attracted much of the same sort of attention that was paid, at various times in antiquity, to such other great names as Pythagoras and Plato himself. More or less fictional, and more or less hagiographical, lives of Hippocrates were written, such as that which passes under the name of Soranus – although whether it was actually written by Soranus of Ephesus, who worked in the early second century A.D. and was the author of a fine treatise on gynaecology, has been disputed. Letters too were forged that purported to have passed between Hippocrates and his great contemporary, the atomist philosopher Democritus. As in modern times, so too in the ancient world, scholars who recognized that there was a Hippocratic question – and there were plenty of them from the second century B.C. – tended nevertheless to assume that Hippocrates himself must have been the author of those treatises that they most admired.

Yet we can and should distinguish both between different

phases in the growth of Hippocrates' reputation and between the different pictures of Hippocrates that were presented. Very broadly speaking, the attitude towards the past became increasingly deferential, not to say reverential, in the ancient world, especially after the second century A.D. Yet although the tendency to idealize Hippocrates generally grew in strength, the Hippocratic writings were also the subject of critical comments. Thus it is clear from the quotations of Herophilus and Erasistratus in Galen that they implicitly, and sometimes explicitly, modified and corrected Hippocratic conceptions on a variety of points. In the first and second centuries A.D. the extant writings of Rufus and Soranus establish that they were far from accepting everything that they ascribe to Hippocrates, Soranus in particular being often highly critical. To cite a single example (and many more could be given from what is preserved of his *Acute Diseases* and *Chronic Diseases* in the Latin version of Caelius Aurelianus), Soranus refers explicitly to Hippocrates at *Gynaecology* I, 45 (*CMG* IV, 31, 26ff.) in mentioning the doctrine that we find in *Aphorisms*, Sec.V, ch. 48, that 'a male foetus inclines to the right' of the womb, and 'a female to the left', and he goes on to state that this doctrine is mistaken.

Secondly one must distinguish between the idealization of Hippocrates as a doctor and the idealization of him as a medical and biological theorist. It is one thing to represent him as the epitome of a skilful, dedicated and upright medical practitioner: it is another to accept his views on problems of pathology, physiology, anatomy and physics. The two often went together, but it was only from the second century A.D. that they tended to do so regularly.

The attitude of Galen (born about A.D. 129) in many ways marks a turning point. Galen himself very soon came to be accepted as a – or even the – chief authority on medical and biological subjects, and his views on Hippocrates were correspondingly highly influential. The tradition of learned commentaries on Hippocratic texts goes back to the third century B.C.: Galen himself, according to his own account in

the treatise *On His Own Books*, composed commentaries, sometimes in several books, on no fewer than nineteen Hippocratic texts. His work on some thirteen of them, including *Epidemics* I, II, III and VI, *Prognosis*, *Regimen in Acute Diseases*, *Aphorisms*, *The Nature of Man*, *A Regimen for Health*, *Fractures* and *Joints*, has survived, as also has his *Glossary* of Hippocratic terms. When we add that he also composed a work on *The Elements according to Hippocrates* and a major treatise on *The Opinions of Hippocrates and Plato* (both of which are extant), the body of Galen's writings directly or indirectly related to Hippocrates is seen to be very considerable, making up more than a quarter of all the work of his that has survived in Greek – and this takes no account of the frequent occasions on which he refers to Hippocrates in other works, usually to cite him as an authority for the view that Galen himself upholds.

Galen was fully aware of, and frequently refers to, scholarly disputes over the authorship of the treatises ascribed to Hippocrates. Thus he remarks concerning *Regimen* and *A Regimen for Health* that these works had been attributed to such men as Euryphon, Ariston and Philistion. In his commentary on *The Nature of Man* he notes that some saw Polybus as the author of the work. In that case, however, he believes that the authenticity of the treatise is proved by the evidence in Plato's *Phaedrus*. Few would now go along with him, but Galen held that Plato must have had *The Nature of Man* in mind when he makes Socrates attribute to 'Hippocrates and the true account' a method that first considers whether a thing is simple or complex, and then, if it is complex, enumerates its parts and their capacities (*Phaedrus* 270c ff.). Yet we should note that it is Galen's view that even if *The Nature of Man* were by Polybus, it would still be good evidence for the doctrines of Hippocrates himself. Galen states that Polybus was the pupil, as well as the son-in-law, of Hippocrates, that he took over from Hippocrates the task of teaching the young, and most important, that he appeared not to have modified any of the doctrines of Hippocrates in his own writings. Galen himself holds that most of the works that were ascribed to Hippocrates were

indeed authentic, but he also believes that others that may not be from Hippocrates' own hand may still faithfully record his views.

Galen acknowledges, on occasion, that there are gaps in Hippocrates' knowledge and that there are points on which he is unclear or even mistaken. In general, however, Galen follows what he represents as the Hippocratic teaching, and treats Hippocrates not only as a distinguished practitioner, but as an authority whose views on medical and biological matters were to be adopted wherever possible. From the point of view of Hippocrates' subsequent reputation, what was crucial was that Galen saw him as the originator of the physical and physiological theory based on the four primary opposites (hot, cold, dry and wet) and the four primary simple bodies or elements (earth, water, air and fire). This was the theory that – with modifications and additions – Galen himself adopted as the foundation of his own account of the ultimate constituents of the body. He took over, for example, the distinction used by Aristotle, among others, between homoeomerous or homogeneous parts (such as flesh, bone and blood) and instrumental ones (such as foot and hand); he also held that each of the primary opposites exists in different grades – so that there are, for example, four degrees of heat; and he put forward a complex doctrine of vital powers or functions. But on the question of the fundamental constituents of physical objects he took over the four-element theory, versions of which he knew had been proposed by both Plato and Aristotle. However, on the basis of the evidence in *The Nature of Man* especially, Galen claimed that it was Hippocrates who had first identified the four primary elements and defined their qualities. As he puts it in his treatise *On the Natural Faculties* (I, ch. 2): 'Of all the doctors and philosophers we know, he [Hippocrates] was the first who undertook to demonstrate that there are, in all, four mutually interacting qualities, through the agency of which everything comes to be and passes away.' Galen certainly admired other aspects of Hippocratic teaching, but his enthusiastic endorsement of the schematism of *The Nature of Man* was especially influential.

After the second century A.D., two main changes may be noted: first the fact that, as already remarked, Galen himself rapidly became the chief authority on questions of anatomy, physiology and pathology; and second the increasingly important place that the commentary, digest or history came to occupy in medical writing. It would certainly be an exaggeration to say that medical and biological inquiry died out entirely after Galen, but more and more work in these fields – as also in philosophy, mathematics and other areas of scientific investigation – came to take the form of commentaries on, or even summaries or abridgements of, earlier texts. We can trace this development through the writings of such men as Oribasius (mid fourth century), Aetius of Amida, Alexander of Tralles (both sixth century), Paul of Aegina (seventh) and Theophilus Protospatharius (not before 600), all of whom, while not totally devoid of originality, relied heavily on earlier sources. Thus Oribasius, substantial parts of whose vast seventy-book encyclopedia of medical knowledge are extant, explains in the preface to the work that his plan is to produce an even more complete compendium than his first effort, which had been based on Galen alone. Now he will draw on 'all the best doctors', though Galen still ranks first among these 'on the grounds that he is supreme among all those who have written about the same subject, since he uses the most exact methods and definitions, as one who follows the Hippocratic principles and opinions'. To judge from the extant books, Galen is indeed Oribasius' principal source, but it is clear that he believes that Galen represents the Hippocratic tradition faithfully.

The main effort of most other later medical writers too was towards summarizing and systematizing medical knowledge, and as time goes on their summaries tend to become more concise. Thus Paul of Aegina refers to Oribasius' work in the proem to his own treatise, where he states that he considered it too bulky and so made a shorter and more convenient compendium of his own. Paul still refers to and quotes from Hippocrates quite freely, including treatises that had not been the subject of commentaries by Galen. But medical writers

evidently came more and more to rely on what Galen had preserved. Thus when Theophilus cites a passage from Hippocrates' *Epidemics* VI in his work on the pulse he reveals where he found it by introducing the quotation with the words, 'Hippocrates speaks thus in the work on the differences of fevers'. There is no such Hippocratic treatise, and it is from Galen's work of that name that the quotation from Hippocrates comes.

After the division of the Roman Empire, the decline in learning was much more rapid and severe in the Roman West than in the Greek East. In the East, as we have seen, some knowledge of Galen and Hippocrates continued down to the seventh century and beyond, but in the West interest in scientific medicine sank to a low ebb. Some medical treatises continued to be written, such as the free Latin versions of Soranus' *Acute Diseases* and *Chronic Diseases* that were produced by Caelius Aurelianus in the fifth century. But otherwise what survived of Greek learning in the West was mostly contained in handbooks that owed their popularity mainly to the curiosities they retailed. Thus a hotchpotch of information on a variety of subjects was preserved in such works as the *Saturnalia* and *Commentary on the Dream of Scipio* of Macrobius (late fourth, early fifth century) and the *Institutions* of Cassiodorus (sixth century). But much less attention was paid in such works to medicine, which was not one of the seven 'liberal arts', than to subjects like astronomy and music. There are occasional references to Hippocrates in the *Saturnalia* – although one of the characters in that work describes medicine as 'the lowest dregs of physics'. Yet on medical matters literary authors came to supplant the original Greek medical writers. In the influential writings of Isidore of Seville (seventh century), medicine and biology are comparatively neglected. Although Hippocrates is mentioned as one of the founders of the 'logical' or 'rational' school of medicine in book IV of Isidore's *Etymologies*, the treatment of medicine there is both superficial and eclectic and we find the Old Testament, Virgil and Horace among the authorities cited.

Meanwhile in the East the preservation and resuscitation of the spirit of inquiry depended, from the eighth century, on the Arabs. After the fall of Alexandria in 642, knowledge of Greek medicine, as of other aspects of Greek learning, spread through the Arab world. In the ninth century, translations of Hippocrates and Galen were undertaken by Hunain, and the polymath Al Kindi covered the entire range of learning and wrote more than twenty treatises on medical subjects, including one specifically on Hippocratic medicine. Among the voluminous writings of Rhazes (Al Razi, died *c.* 925) were the *Al Mansuri*, which contained among other things a detailed account of human anatomy, and the so-called *Liber Continens*, the *Kitabu'l Hawi Fi't-Tibb*, a medical encyclopedia in twenty-three books. The intensive study of medicine was sustained in the tenth century by Ali-Abbas, who quotes Hippocrates in his anatomical treatise, and in the eleventh by Avicenna; and nearly all the great names in the western school of Arabic philosophy, including the greatest of all, Averroes (twelfth century), were also doctors and wrote on medical subjects. Most of these Arabic writers knew their Hippocrates as well as their Galen and saw themselves as upholding the best traditions of Greek medicine.

It was, of course, mainly through Latin translations, both of these Arabic authors and then of the Greeks themselves, that knowledge of Greek medicine, as of other parts of Greek science, was revived in the Christian West, although, as the manuscript tradition shows, some Latin versions of Greek texts survived throughout the Dark Ages. In this revival, two centres were particularly important. At Salerno, which had a flourishing medical school from about the late tenth century, Latin translations and paraphrases of Rhazes (among others) and of some Hippocratic works were made in the eleventh century by Constantine the African (whether he used the Arabic versions of Hippocrates or worked direct from Greek manuscripts is disputed). And at Toledo an important series of translations was done in the twelfth century by Gerard of Cremona and others; these included many Arabic medical

treatises, for example the *Canon* of Avicenna. Hippocrates and Galen began to figure prominently in the curricula of the medical faculties of European universities from the fourteenth century, and many new Latin translations of their works were made in that and the next two centuries, while vernacular translations of the most popular Hippocratic works, such as the *Aphorisms* and *Prognosis*, had been initiated by the mid sixteenth century. Yet a number of late forgeries and spurious treatises, such as the prognostic work known as the *Secreta* or the *Liber Veritatis*, as well as a motley collection of letters, continued for long to pass for genuine Hippocrates, and his authority was invoked in support not only of the humoral theory but also of astrological doctrines.

By about the middle of the fourteenth century Galen had once again achieved the position of dominance, as the outstanding authority in anatomy and physiology, that he had enjoyed in the Greco-Roman world, and the advance of knowledge in both fields depended on going beyond him. Although Galen and the Galenists had been criticized before, Vesalius' attack on him, and more especially on them, may be mentioned as one of the most influential. His *De Humani Corporis Fabrica*, which was first published in 1543, combined an onslaught on Galen with an insistence on the need for dissection. While acknowledging Galen as 'easily the foremost among the teachers of anatomy', Vesalius castigates him for his errors and the Galenists for the blindness with which they followed him. 'So completely have all surrendered to [Galen's] authority,' he writes in his preface, 'that no doctor has been found to declare that in the anatomical books of Galen even the slightest error has ever been found, much less could now be found . . . '

> For I am not unaware how the medical profession . . . are wont to be upset when in more than two hundred instances, in the conduct of the single course of anatomy I now exhibit in the schools, they see that Galen has failed to give a true description of the interrelation, use, and function of the parts of man . . . Yet they too, drawn by the love of truth, gradually abandon that attitude and, growing less emphatic, begin to put their faith in their own not

ineffectual sight and powers of reason rather than in the writings of Galen.*

Yet the overthrow of Galen in medicine (paralleled by that of Aristotle in physics and that of Ptolemy in astronomy) left Hippocrates' own reputation in many respects untouched. Indeed in the sixteenth, seventeenth and eighteenth centuries there were many leading medical writers who continued to express their admiration for Hippocrates and who advocated a return to what he stood for. They included Guillaume de Baillou (born *c.* 1538) in France, who modelled his own case-histories on the Hippocratic *Epidemics*, Sydenham (born 1624) in England, and Boerhaave (born 1668) in Holland. For Sydenham, for instance, Hippocrates was an 'unrivalled historian of disease', who had 'founded the Art of Medicine on a solid and unshakeable basis', namely the principle that 'our natures are the physicians of diseases' and the method of 'the exact description of nature'.† But what these men admired in Hippocrates was not the anatomy and the physiology of the treatises, so much as two things particularly: firstly the detailed and meticulous clinical observations, and secondly the example he set of the doctor's devotion and concern for his patients, and of his uprightness and discretion in his dealings with them. For this example, especially, Hippocrates continued, and continues, to inspire.

Since the seventeenth century the rate of change in medicine has continued to accelerate. Yet the Hippocratic writings are still of great value to us today – and not merely in the context of the history of science. Their importance in that context – and for the historian of culture – has been described briefly above: they throw light not only on the origins and early development of medicine and on its place in Greek society, but also on the development of early Greek science as a whole. But these texts also retain a more general interest for the medical profession and for all concerned with the ethics of

*Translation from B. Farrington, in *Proceedings of the Royal Society of Medicine*, 25, 1932, Section of the History of Medicine, pp. 39–48.

†Preface to the third edition (1676) of *Observationes Medicae*, ed. G. A. Greenhill, London, 1844, para. 15, pp. 13f.

medicine. Issues relating to questions of medical ethics and of the ethics of scientific research are as live today as they have ever been, and it is instructive to study the Hippocratics not simply because the name of Hippocrates is so often invoked in such discussions, but because it is with the Hippocratic authors that the question of the duties of the doctor both to his patient and to society as a whole first come to be the subject of debate. They were the first to attempt to establish a code of behaviour for the medical profession and to define the doctor's obligations, first to see to it that medical knowledge is used for good and not for ill, and second not to exploit his privileged relationship with his patient in any way. Western medicine has come a long way since its Greek origins. Yet on questions of medical ethics and etiquette, not only do we owe a debt to the past – as the source of many of the unwritten assumptions, as well as of some of the explicit rules, that still govern the relationship between the doctor and patient – but we still have something to learn from it. While most of the anatomical, physiological and pathological doctrines in the Hippocratic writings have long since been superseded, the ideal of the selfless, dedicated and compassionate doctor they present has lost none of its relevance in the twentieth century.

MEDICINE

TRANSLATED BY
J. CHADWICK AND W. N. MANN

TRANSLATORS' INTRODUCTION*

THE TEXT AND THE TRANSLATION

BOOKS in Ancient Greece could only be made by individual copying. They were therefore not produced in any great numbers and there was always a chance of errors creeping in each time a new copy was made. As these faulty texts were themselves copied so the errors were multiplied and propagated; at the same time readers or copyists might make corrections either by conjecture or by comparison with another copy. Hippocrates has of course suffered much in this process which has preserved the works for us. Our earliest manuscript is probably of the tenth century A.D.; that is, it was written at least thirteen hundred years after the works it contained were composed. We have others of the eleventh and twelfth centuries and a number of less valuable later ones. From a comparison of these it is possible to reconstruct a fairly satisfactory text, but there will obviously be places where none of the manuscripts provides a likely reading or where they all fail. In the one case we must, if possible, restore by conjecture what was the probable text, in the other we can do nothing but signify the gap or *lacuna* by a row of asterisks. Some important chapters of *Airs, Waters, Places* are lost in this way. However, the researches of generations of scholars have succeeded in restoring what is on the whole a sound and reliable text. In translation we have done our best to avoid any discussion of dubious readings, selecting where possible that which seems to make the best sense. In one or two places we have varied the traditional order to improve the connection of thought. In a very few instances we have ventured to make new suggestions which we think are demanded by the sense; but in the main we have followed the best texts available.†

*The following is an abbreviated version of the translators' original introduction.

†See below p. 354.

The numbers of paragraphs and sections are traditional and have been inserted for the benefit of readers who wish to refer to the Greek texts or other translations.

The ideal translator of Hippocrates would have to be not only acquainted with Ancient Greek but also to have a wide knowledge of practical medicine. In these days such a combination must be extremely rare, and we hope we have found a satisfactory substitute in our close co-operation in the respective fields. The translation has gone through several stages. First a careful and literal rendering was made of the Greek together with notes on the meaning and alternative interpretations; this was edited, taking careful note of the medical significance of the passage, and put into current English. This revision was then checked against the Greek original, and so on, until a mutually agreed form was reached. As far as possible we have used modern medical English, with the obvious limitations. In some cases the original Greek medical term is still in current use but it is no longer, as may be seen from the context, a correct translation, for in the course of time the word may have come to bear a more limited or even a changed meaning. Thus the Greek word *noma* means a gangrenous patch and in the Hippocratic text is used to describe this condition occurring on the tonsils. However, in current medical terminology the word is used exclusively to describe gangrene of the mouth or *cancrum oris*. It is clear that to use the English word 'noma' as a translation of the Greek word *noma* falsifies the sense. We have, however, avoided using the modern name of a disease where there is no evidence that Hippocrates appreciated its morbid identity. In such cases we have left the translation as literal as possible, and in one case we have kept the Greek word. Hippocrates refers frequently to a febrile malady he terms *causus*. It is certain that he included under this diagnosis a variety of fevers common in the Levant, but which we now separate into a number of different diseases. In many cases, enteric fever is clearly described; but as the condition, *causus*, cannot be generally identified as a single disease, the term is kept in the translation whenever it appears in the original text.

There are evident pitfalls in this joint method of translation. For instance, it is very easy, particularly in textually corrupt passages, to ascribe to Hippocrates an insight into morbid processes which he did not have. But we believe we have made few such mistakes. The alternative is to leave this selection and interpretation to the reader, but that was not our object in producing this new translation. The readers for whom this book is intended may not have the time nor opportunities to weigh and scrutinize each sentence; they will expect that to have been done for them, and they have here presented the best that the translators can provide. Nor need they fear that the necessary interpretation has obscured their view of the real Hippocrates; a glance at previous translations will show that this does not affect the major part of the work, or indeed the important conclusions.

A note on the system of counting days seems necessary. It was the Greek custom to include the days at both ends, so that the third day means the day after tomorrow, and so on – a meaning familiar in terms taken from Greek medicine such as tertian or quartan. It seems best, once this has been pointed out, to leave all the numbers as they appear in the Greek text; the reader must remember that the twentieth day, for example, means what we should in ordinary speech call the nineteenth.

CHRONOLOGICAL NOTE

Hippocrates, writing 400 years before the introduction of the Julian calendar, had no convenient method for giving dates in the year. There were several different calendars in use in Greece, and they were all based upon lunar months, so that the same date would not always fall on the same day of the solar year. It was therefore common practice to use certain astronomical events as a rough method of dating. The four obvious points are the equinoxes and solstices: 21 March, 21 September, 21 June, 22 December. These are from time to time supplemented by reference to the heliacal rising or setting of certain stars and constellations. Owing to the precession of the equinoxes these are not constant, and various factors

prevent an exact calculation of the dates Hippocrates intended. The chief of these mentioned in the text, together with their approximate equivalents, are:

The rising of Arcturus	10 September
The rising of the Pleiads	10 May
The setting of the Pleiads	11 November
The rising of the Dog Star	17 July

THE OATH

I SWEAR by Apollo the healer, by Aesculapius, by Health and all the powers of healing, and call to witness all the gods and goddesses that I may keep this Oath and Promise to the best of my ability and judgement.

I will pay the same respect to my master in the Science as to my parents and share my life with him and pay all my debts to him. I will regard his sons as my brothers and teach them the Science, if they desire to learn it, without fee or contract. I will hand on precepts, lectures and all other learning to my sons, to those of my master and to those pupils duly apprenticed and sworn, and to none other.

I will use my power to help the sick to the best of my ability and judgement; I will abstain from harming or wronging any man by it.

I will not give a fatal draught to anyone if I am asked, nor will I suggest any such thing. Neither will I give a woman means to procure an abortion.

I will be chaste and religious in my life and in my practice.

I will not cut, even for the stone, but I will leave such procedures to the practitioners of that craft.

Whenever I go into a house, I will go to help the sick and never with the intention of doing harm or injury. I will not abuse my position to indulge in sexual contacts with the bodies of women or of men, whether they be freemen or slaves.

Whatever I see or hear, professionally or privately, which ought not to be divulged, I will keep secret and tell no one.

If, therefore, I observe this Oath and do not violate it, may I prosper both in my life and in my profession, earning good repute among all men for all time. If I transgress and forswear this Oath, may my lot be otherwise.

THE CANON

A brief note on the characteristics desirable in a student of medicine.

ALTHOUGH the art of healing is the most noble of all the arts, yet, because of the ignorance both of its professors and of their rash critics, it has at this time fallen into the least repute of them all. The chief cause for this seems to me to be that it is the only science for which states have laid down no penalties for malpractice. Ill-repute is the only punishment and this does little harm to the quacks who are compounded of nothing else. Such men resemble dumb characters on the stage who, bearing the dress and appearance of actors, yet are not so. It is the same with the physicians; there are many in name, few in fact.

For a man to be truly suited to the practice of medicine, he must be possessed of a natural disposition for it, the necessary instruction, favourable circumstances, education, industry and time. The first requisite is a natural disposition, for a reluctant student renders every effort vain. But instruction in the science is easy when the student follows a natural bent, so long as care is taken from childhood to keep him in circumstances favourable to learning and his early education has been suitable. Prolonged industry on the part of the student is necessary if instruction, firmly planted in his mind, is to bring forth good and luxuriant fruit.

The growth of plants forms an excellent parallel to the study of medicine. Our characters resemble the soil, our masters' precepts the seed; education is the sowing of the seed in season and the circumstances of teaching resemble the climatic conditions that control the growth of plants. Industrious toil and the passage of time strengthen the plant and bring it to maturity.

The man, then, who brings these qualities to the study of medicine and who has acquired an exact knowledge of the

subject before he sets out to travel from city to city, must be considered a doctor not only in name but in fact. Want of skill is a poor thing to prize and treasure. It robs a man of contentment and tranquillity night and day and makes him prone to cowardice and recklessness, the one a mark of weakness, the other of ignorance. Science and opinion are two different things; science is the father of knowledge but opinion breeds ignorance.

Holy things are revealed only to holy men. Such things must not be made known to the profane until they are initiated into the mysteries of science.

TRADITION IN MEDICINE

An explanation of the empirical basis of medicine as practised about the end of the fifth century B.C. This treatise is sometimes referred to as On Ancient Medicine.

1. In all previous attempts to speak or to write about medicine, the authors have introduced certain arbitrary postulates* into their arguments, and have reduced the causes of death and the maladies that affect mankind to a narrow compass. They have supposed that there are but one or two causes: heat or cold, moisture, dryness or anything else they may fancy. From many considerations their mistake is obvious; indeed, this is proved from their own words. They are specially to be censured since they are concerned with no bogus science, but one which all employ in a matter of the greatest importance, and one of which the good professors and practitioners are held in high repute. But besides such there are both sorry practitioners and those who hold widely divergent opinions. This could not happen were medicine a bogus science to which no consideration had ever been given and in which no discoveries had been made. For if it were so, all would be equally inexperienced and ignorant, and the condition of their patients due to nothing but the law of chance. But this is not so, and the practitioners of medicine differ greatly among themselves both in theory and practice just as happens in every other science. For this reason I do not think that medicine is in need of some new postulate, dealing, for instance, with invisible or problematic substances, and about which one must have some postulate or another in order to discuss them seriously. In such matters, medicine differs from subjects like astronomy and geology, of which a man might know the truth and lecture on it without either he or his audience being able to judge whether it were the truth or not, because there is no sure criterion.

*The term translated 'postulate' is *hypothesis*, on the meaning of which see editor's introduction, p. 43.

2. Medicine has for long possessed the qualities necessary to make a science. These are a starting point and a known method according to which many valuable discoveries have been made over a long period of time. By such a method, too, the rest of the science will be discovered if anyone who is clever enough is versed in the observations of the past and makes these the starting point of his researches. If anyone should reject these and, casting them aside, endeavour to proceed by a new method and then assert that he has made a discovery, he has been and is being deceived. A discovery cannot be made thus, and the reason why such a thing is impossible I shall endeavour to show by expounding the true nature of the science. My exposition will demonstrate clearly the impossibility of making discoveries by any other method but the orthodox one.

It seems to me to be of the greatest importance that anyone speaking of the science should confine himself to matters known to the general public, since the subject of inquiry and discourse is none other than the maladies of which they themselves fall sick. Although it were no easy matter for common people to discover for themselves the nature of their own diseases and the causes why they get worse or get better, yet it is easy for them to follow when another makes the discoveries and explains the events to them. Then when a man hears about a disease he will only have to remember his own experience of it. But if anyone departs from what is popular knowledge and does not make himself intelligible to his audience, he is not being practical. For such reasons we have no need of a postulate.

3. In the first place, the science of medicine would never have been discovered nor, indeed, sought for, were there no need for it. If sick men fared just as well eating and drinking and living exactly as healthy men do, and no better on some different regimen, there would be little need for the science. But the reason why the art of medicine became necessary was because sick men did not get well on the same regimen as the healthy, any more than they do now. What is more, I am of the opinion that our present way of living and our present

diet would not have come about if it had proved adequate for a man to eat and drink the same things as an ox or a horse and all the other animals. The produce of the earth, fruits, vegetables and grass, is the food of animals on which they grow and flourish without needing other articles of diet. In the beginning I believe that man lived on such food and the modern diet is the result of many years' discovery. Such devising was necessary because, in primitive times, men often suffered terribly from their indigestible and animal-like diet, eating raw and uncooked food, difficult to digest. They suffered as men would suffer now from such a diet, being liable to violent pain and sickness and a speedy death. Certainly such ills would probably prove less serious then than now because they were accustomed to this kind of food, but even then, such illnesses would have been serious and would have carried off the majority of a weak constitution although the stronger would survive longer, just as now some people easily digest strong meats while others suffer much pain and illness from them. For this reason I believe these primitive men sought food suitable to their constitutions and discovered that which we now use. Thus, they took wheat and wetted it, winnowed it, ground it, sifted it, and then mixed it and baked it into bread, and likewise made cakes from barley. They boiled and baked and mixed and diluted the strong raw foods with the weaker ones and subjected them to many other processes, always with a view to man's nature and his capabilities. They knew that if strong food was eaten the body could not digest it and thus it would bring about pain, sickness and death, whereas the body draws nourishment and thus grows and is healthy from food it is able to digest. What fairer or more fitting name can be given to such research and discovery than that of medicine, which was founded for the health, preservation and nourishment of man and to rid him of that diet which caused pain, sickness and death?

4. It is perhaps not unreasonable to assert that this is no science, for no one can properly be called the practitioner of a science of which the facts are unknown to none and with which all are acquainted by necessity and experience. The

discoveries of medicine are of great importance and are the result of thought and skill on the part of many people. For instance, even now trainers in athletics continue to make discoveries according to the same method; they determine what men must eat and drink to gain the greatest mastery over their bodies and to achieve the maximum strength.

5. Turning now to what is generally admitted to be the science of medicine, namely, discoveries concerning the sick, which is a science in name and boasts practitioners, let us consider whether it has the same purposes and from what origins it arose. As I have already said, I do not believe anyone would ever have looked for such a science if the same regimen were equally good for the sick and the healthy. Even now some people, the barbarians and some Greeks, who have no knowledge of medicine, go on behaving when they are ill just as they do in health. They neither abstain from nor moderate the use of the things they like. Those who sought for and found the science of medicine held the same opinion as those whom I mentioned before. First of all, I imagine, they cut down the quantity without changing the quality of the food, making the sick eat very little. But when it became clear to them that such a regimen suited and helped some of the sick but not all, and that there were some even who were in such a condition that they could not digest even a very little food, then they concluded that in some cases a more easily digested food was necessary. Thus they invented gruel by mixing a little strong food with much water, so taking away its strength by dilution and cooking. For those that could not digest even gruel, they substituted liquid nourishment, taking care that this should be of moderate dilution and quantity, neither too weak nor too strong.

6. It must be clearly understood, however, that gruel is not necessarily of assistance to everyone who is sick. In some diseases it is evident that on such a diet, the fever and pains increase, the gruel serving as nourishment to the disease, but as a source of decline and sickness to the body. In such cases were dry food to be taken, barley-cakes or bread for example, even in very small quantities, the patients would become ten

times worse than they would be on a diet of gruel, simply because of the strength of the food. Again, a man who was helped by gruel but not by dry food would be worse if he ate more of the latter than if he took only a little, and even a small quantity would give him pain. In fact, it is obvious that all the causes of such pains come to the same thing; the stronger foods are the most harmful to man whether he be in health or sickness.

7. What then is the difference in intention between the man who discovered the mode of life suitable for the sick, who is called a physician and admitted to be a scientist, and him who, from the beginning, discovered the way to prepare the food we eat now instead of the former wild and animal-like diet? I can see no difference; the discovery is one and the same thing. The one sought to do away with those articles of diet which, on account of their savage and undiluted nature, the human frame could not digest, and on which it could not remain healthy; the other discovered what a sick man could not digest in view of his particular malady. What difference is there save in the appearance, and that the one is more complicated and needs more study? Indeed, one is the forerunner of the other.

8. A comparison between the diets of a sick man and a healthy one shows that the diet of a healthy man is no more harmful to a sick man than that of a wild beast to a healthy man. Suppose a man be suffering from a disease, neither something malignant nor incurable, nor yet some trifling ailment, but one nevertheless of which he is well aware. If he were to eat bread or meat or anything else which is nourishing to a healthy man, but in smaller quantities than if he were well, he would suffer pain and run some risk. Now suppose a healthy man with neither an utterly weak nor a strong constitution were to take small quantities of a diet which would give strength and nourishment to an ox or a horse, such as vetch or barley-corn, he would suffer no less pain and run no less risk than the sick man who inopportunely ate bread or barley-cake. This proves that the whole science of medicine might be discovered by research according to these principles.

9. If it were all as simple as this, that the stronger foods are harmful and the weaker good and nourishing for men both in health and sickness, the matter were an easy one. The safest course would be to keep to the weaker food. But if a man were to eat less than enough he would make as big a mistake as if he were to eat too much. Hunger is a powerful agent in the human body; it can maim, weaken and kill. Under-nourishment gives rise to many troubles and, though they are different from those produced by over-eating, they are none the less severe because they are more diverse and more specific. One aims at some criterion as to what constitutes a correct diet, but you will find neither number nor weight to determine what this is exactly, and no other criterion than bodily feeling. Thus exactness is difficult to achieve and small errors are bound to occur. I warmly commend the physician who makes small mistakes; infallibility is rarely to be seen. Most doctors seem to me to be in the position of poor navigators. In calm weather they can conceal their mistakes, but when overtaken by a mighty storm or a violent gale, it is evident to all that it is their ignorance and error which is the ruin of the ship. So it is with the sorry doctors who are the great majority. They cure men but slightly ill, in whose treatment even the biggest mistakes would have no serious consequences. Such diseases are many and much more common than the more serious ones. When doctors make mistakes over such cases, their errors are unperceived by the layman, but when they have to treat a serious and dangerous case, a mistake or lack of skill is obvious to all, and vengeance for either error is not long delayed.

10. That over-eating should cause no less sickness than excessive fasting is easily understood by reference to the healthy. Some find it better to dine but once a day and consequently make this their custom. Others, likewise, find it is better for them to have a meal both at noon and in the evening. Then there are some who adopt one or other of these habits merely because it pleases them or because of chance circumstances. On the grounds of health it matters little to most people whether they take but one meal a day or two. But there are some who, if they do not follow their usual

custom, do not escape the result and they may be stricken with a serious illness within a day. Some there are who, if they take luncheon when this practice does not agree with them, at once become both mentally and physically dull; they yawn and become drowsy and thirsty. If subsequently they should dine as well, they suffer from wind, colic and diarrhoea and, not infrequently, this has been the start of a serious illness even though they have taken no more than twice the amount of food they have been accustomed to. Similarly, a man who is accustomed to taking luncheon because he finds that this agrees with him, cannot omit the meal without suffering great weakness, fear and faintness. In addition, his eyes become sunken, the urine more yellow and warmer, the mouth bitter, and he has a sinking feeling in his stomach. He feels dizzy, despondent and incapable of exertion. Then later when he sits down to dine, food is distasteful to him and he cannot eat his customary dinner. Instead, the food causes colic and rumblings and burns the stomach; he sleeps poorly and is disturbed by violent nightmares. With such people this too has often been the start of some illness.

11. Let us consider the reason for these things. The man who is accustomed to dine only once a day suffers, in my opinion, when he takes an extra meal because he has not waited long enough since the last. His stomach has not fully benefited from the food taken on the previous day and has neither digested nor discarded it, nor calmed down again. This new food is introduced into the stomach while it is still digesting and fermenting the previous meal. Such stomachs are slow in digestion and need rest and relaxation. The man who is accustomed to a meal at midday suffers when he has to go without, because his body needs nourishment and the food taken at the previous meal has already been used up. If no fresh food be taken his body wastes through starvation, and I attribute to this the symptoms from which I described such a man to suffer. I maintain that other healthy people will suffer from these same troubles if they fast for two or three days.

12. Those constitutions which react rapidly and severely to changes in habit are, in my opinion, the weak ones. A weak

man is next to a sick man, while a sick man is made still weaker by indiscretions in his diet. In matters requiring such nicety, it is impossible for science to be infallible. There are many things in medicine which require just as careful judgement as this matter of diet, and of these I will speak later. I contend that the science of medicine must not be rejected as non-existent or ill-investigated because it may sometimes fail in exactness. Even if it is not always accurate in every respect, the fact that it is able to approach close to a standard of infallibility as a result of reasoning, where before there was great ignorance, should command respect for the discoveries of medical science. Such discoveries are the product of good and true investigation, not chance happenings.

13. I wish now to return to those whose idea of research in the science is based upon the new method: the supposition of certain postulates. They would suppose that there is some principle harmful to man: heat or cold, wetness or dryness, and that the right way to bring about cures is to correct cold with warmth, or dryness with moisture and so on. On such an assumption let us consider the case of a man of weak constitution. Suppose he eats grains of wheat as they come straight from the threshing-floor and raw meat, and suppose he drinks water. If he continues with such a diet I am well aware that he will suffer terribly. He will suffer pain and his body will become enfeebled; his stomach will be disordered and he will not be able to live long. What remedy, then, should be employed for someone in this condition? Heat or cold or dryness or wetness? It must obviously be one of them because these are the causes of disease, and the remedy lies in the application of the opposite principle according to their theory. Really, of course, the surest remedy is to stop such a diet and to give him bread instead of grains of wheat, cooked instead of raw meat and wine to drink with it. Such a change is bound to bring back health so long as this has not been completely wrecked by the prolonged consumption of his former diet. What conclusion shall we draw? That he was suffering from cold and the remedy cured him because it was hot, or the reverse of this? I think this is a question which

would greatly puzzle anyone who was asked it. What was taken away in preparing bread from wheat; heat, cold, moisture or dryness? Bread is subjected to fire and water and many other things in the course of its preparation, each of which has its own effect. Some of the original qualities of wheat are lost, some are mixed and compounded with others.

14. I know too that the body is affected differently by bread according to the manner in which it is prepared. It differs according as it is made from pure flour or meal with bran, whether it is prepared from winnowed or unwinnowed wheat, whether it is mixed with much water or little, whether well mixed or poorly mixed, over-baked or under-baked, and countless other points besides. The same is true of the preparation of barley-meal. The influence of each process is considerable and each has a totally different effect from another. How can anyone who has not considered such matters and come to understand them, possibly know anything of the diseases that afflict mankind? Each one of the substances of a man's diet acts upon his body and changes it in some way and upon these changes his whole life depends, whether he be in health, in sickness, or convalescent. To be sure, there can be little knowledge more necessary. The early investigators in this subject carried out their researches well and along the right lines. They referred everything to the nature of the human body, and they thought such a science worthy of being ascribed to a god, as is now believed. They never imagined that it was heat or cold, or wetness or dryness, which either harmed a man or was necessary to his health. They attributed disease to some factor stronger and more powerful than the human body which the body could not master. It was such factors they sought to remove. Every quality is at its most powerful when it is most concentrated; sweetness at its sweetest, bitterness at its bitterest, sharpness at its sharpest and so forth. The existence of such qualities in the body of man was perceived together with their harmful effects. There exists in man saltness, bitterness, sweetness, sharpness, astringency, flabbiness and countless other qualities having every kind of influence, number and strength. When these are properly

mixed and compounded with one another, they can neither be observed nor are they harmful. But when one is separated out and stands alone it becomes both apparent and harmful. Similarly, the foods which are unsuitable for us and harm us if eaten, all have some such characteristic; either they are bitter or salt or sharp or have some other strong and undiluted quality. For that reason we are disturbed by them, just as similar qualities when retained in the body harm us. Those things which form the ordinary and usual food of man, bread and barley-cakes and the like, are clearly farthest removed from those things which have a strong or strange taste. In this way they differ from those that are prepared and designed for pleasure and luxury. The simple foods least often give rise to bodily disturbance and a separation of the forces located there. In fact, strength, growth and nourishment come from nothing but what is well mixed and contains no strong nor undiluted element.

15. I am utterly at a loss to know how those who prefer these hypothetical arguments and reduce the science to a simple matter of 'postulates' ever cure anyone on the basis of their assumptions. I do not think that they have ever discovered anything that is purely 'hot' or 'cold', 'dry' or 'wet', without it sharing some other qualities. Rather, I fancy, the diets they prescribe are exactly the same as those we all employ, but they impute heat to one substance, cold to another, dryness to a third and wetness to a fourth. It would be useless to bid a sick man to 'take something hot'. He would immediately ask 'What?' Whereupon the doctor must either talk some technical gibberish or take refuge in some known solid substance. But suppose 'something hot' is also astringent, another is hot and soothing as well, while a third produces rumbling in the belly. There are many varied hot substances with many and varied effects which may be contrary one to another. Will it make any difference to take that which is hot and astringent rather than that which is hot and soothing, or even that which is cold and astringent or cold and soothing? To the best of my knowledge the opposite is the case; everything has its own specific effect. This is not only true of the human body but is

seen in the various substances used for working hides and wood and other things less sensitive than flesh and blood. It is not the heating effect of the application which is so important as its astringent or soothing qualities and so on, and this is true whether the substance be taken internally or applied as an ointment or plaster.

16. I think cold and heat are the weakest of the forces which operate in the body, and for these reasons. So long as cold and heat are present together they are harmless, for heat is tempered by cold and cold by heat. But when the two principles are separated from each other then they become harmful. However, when the body is chilled, warmth is spontaneously generated by the body itself so there is no need to take special measures, and this is true both in health and in disease. For instance, if a healthy man cools his body by taking a cold bath or by any other means, the more he cools himself the warmer he feels when he resumes his garments and comes into shelter again. This is only true, of course, so long as he does not wholly freeze. Again if he should warm himself thoroughly with a hot bath or at a fire, and then go into a cool place, it will seem to be much colder than formerly and he will shiver more. Should anyone cool himself with a fan on a very hot day, the heat seems ten times more suffocating when the fan is stopped than if its cooling properties had not been used at all. Let us consider now a more extreme example. If people get their feet, hands or head frozen by walking through snow or from exposure to cold, think of what they suffer from burning and irritation at night when they are wrapped up and come into a warm place; in some cases blisters come up like those formed by a burn. But these things do not happen before they get warm. This shows how readily each of this pair replaces the other. There are countless other examples I might give to illustrate this subject. Is it not true of sick men that those who have the severest chill develop the highest fever? And even when the fever abates its fury a little, the patient remains very hot. Then subsequently as it passes through the body, it finishes in the feet, that is the first part of the body to be attacked by the chill and the part which remained cold the longest. Again

when the patient sweats as the fever falls, he feels much colder than if he had not had the fever at all. What great or fearful effect, then, can a thing have when its opposite appears of itself with such speed and removes any effect that the former may have had? What need is there, also, for further assistance when nature neutralizes the effect of such an agent spontaneously?

17. Some may raise the objection that the fever of patients suffering from *causus*, pneumonia or other serious diseases does not rapidly decline. Neither in such cases is the fever intermittent. I think that such observations constitute a good proof of my own view that a high temperature is not the only element of a fever nor the only cause of the weak constitution of a febrile patient. May it not be said of a thing that it is both bitter and hot, sharp and hot, salt and hot, and countless other combinations both with heat and cold? In each combination, the effect of any two qualities acting together will be different. Such qualities may be harmful but there is as well the heat of physical exertion which increases as the strength increases and has no ill effects.

18. The truth of this may be demonstrated by the following consideration of certain signs. An obvious one, and one we have all experienced and shall continue to do so, is that of the common cold. When we have a running at the nose and there is a discharge from the nostrils, the mucus is more acrid than that which is present when we are well. It makes the nose swell and renders it hot and extremely inflamed, if you apply your hand to it. And if it lasts a long time, the part, being fleshless and hard, becomes ulcerated. The fever does not fall when the nose is running, but when the discharge becomes thicker, less acrid, milder and more of its ordinary consistency. Similar changes may be seen as the result of cold alone, but the same observations can be made. There is the same change from cold to hot and hot to cold and the changes take place readily and do not require any process of 'digestion'. I assert too that all other illnesses that are caused by acrid or undiluted humours within the body follow a similar course; they subside as these humours become less potent and are diluted.

19. Those humours which affect the eyes are very acrid and cause sores upon the eyelids; sometimes they cause destruction of the cheeks and the parts beneath the eyes. The discharge destroys anything it may touch, even eating away the membrane which surrounds the eye. Pain, heat and swelling obtain until such time as the discharges are 'digested' and become thicker and give rise to a serum. The process of 'digestion' is due to their being mixed and diluted with one another and warmed together. Again, the humours of the throat which cause hoarseness and sore throats, those of erysipelas or pneumonia are at first salt, moist and acrid and during this phase the maladies flourish. But when the discharges become thicker and milder and lose their acridity, the fevers cease as well as the other effects of the disease which are harmful to the body. The cause of these maladies is found in the presence of certain substances, which, when present, invariably produce such results. But when the nature of these substances becomes changed, the illness is at an end. Any abnormal condition which arose purely as a result of heat or cold and into which no other factor entered at all would be resolved when a change occurred from hot to cold or vice versa. However, the changes which take place really occur in the manner I described above. All the ills from which man suffers are due to the operation of 'forces'. For instance, if a sufferer from biliousness, complaining of nausea, fever and weakness, gets rid of a certain bitter material which we call yellow bile either by himself or with the assistance of purging, it is evident how he gets rid of both the fever and the pain at the same time. As long as this material is unabsorbed and undiluted, no device will terminate either the pain or the fever. When there are pungent rust-coloured acids present in the body, there is frenzy and severe pain in the bowels and in the chest and distress which cannot be cured until they have been purged of the acrid humours responsible and their poisonous effects neutralized by being mixed with other fluids. It is in the processes of digestion, change, dilution or thickening by which the nature of a humour is altered that the causes of disease lie. It is for this reason that the occurrence of crises and the periodicity of certain diseases are

so important. It is most improper that all these changes should be attributed to the effects of heat and cold, for such principles are not subject to degeneration or thickening. The changes of disease cannot be due to the effect of varying mixtures of such principles, for the only thing that will mix with heat and reduce its warmth is coldness and vice versa. The various forces in the body become milder and more health-giving when they are adjusted to one another. A man is healthiest when these factors are co-ordinated and no particular force predominates.

20. I think I have discussed this subject sufficiently, but there are some doctors and sophists who maintain that no one can understand the science of medicine unless he knows what man is; that anyone who proposes to treat men for their illnesses must first learn of such things. Their discourse then tends to philosophy, as may be seen in the writings of Empedocles and all the others who have ever written about Nature; they discuss the origins of man and of what he was created. It is my opinion that all which has been written by doctors or sophists on Nature has more to do with painting than medicine. I do not believe that any clear knowledge of Nature can be obtained from any source other than a study of medicine and then only through a thorough mastery of this science. It is my intention to discuss what man is and how he exists because it seems to me indispensable for a doctor to have made such studies and to be fully acquainted with Nature. He will then understand how the body functions with regard to what is eaten and drunk and what will be the effect of any given measure on any particular organ. It is not enough to say 'cheese is harmful because it produces pain if much of it is eaten'. One should know what sort of pain, why it is produced and which organ of the body is upset. There are many other harmful items of food and drink which affect the body in different ways. For example, the taking of large quantities of undiluted wine has a certain effect upon the body and it is recognized, by those who understand, that the wine is the cause and we know which organs are particularly affected. I want to show that the same sort of thing is true of other cases. Cheese, since that is the example I used, is not equally

harmful to all. Some can eat their fill of it without any unpleasant consequences and those whom it suits are wonderfully strengthened by it. On the other hand, there are some who have difficulty in digesting it. There must, then, be a difference in their constitutions and the difference lies in the fact that, in the latter case, they have something in the body which is inimical to cheese and this is aroused and disturbed by it. Those who have most of this humour and in whom it is at its strongest, naturally suffer most. If cheese were bad for the human constitution in general, it would affect everyone. Knowledge of this would avoid harm.

21. Both during convalescence as well as in the course of prolonged illnesses, complications are often seen. Some of them occur naturally in the course of the disease, others are occasioned by some chance happening. Most doctors, like laymen, tend to ascribe some such event to some particular activity that has been indulged in. In the same way they may ascribe something as being due to an alteration in their habits of bathing or walking or a change of diet, whether this is the actual case or not. As a result of jumping to conclusions, the truth may escape them. One must know with exactitude what is the effect of a bath or of fatigue indulged in at the wrong time. Neither such actions, nor eating too much, nor eating the wrong food will always produce the same effects; it depends upon other factors as well. No one who is unacquainted with the specific effects of such action on the body in different circumstances can know the results which follow and consequently he cannot make proper use of them as therapeutic measures.

22. I think it should also be known what illnesses are due to 'forces' and what to 'forms'. By 'forces' I mean those changes in the constitution of the humours which affect the working of the body; by 'forms' I mean the organs of the body. Some of the latter are hollow and show variations in diameter, being narrow at one end and wide at the other, some are elongated, some solid and round, some flat and suspended, some are stretched out, some large, some thick, some are porous and sponge-like. For instance, which type of hollow

organ should be the better able to attract and absorb moisture from the rest of the body: those which are all broad or those which are wide in part and narrow down? The latter kind. Such things have to be deduced from a consideration of what clearly happens outside the body. For instance, if you gape with your mouth wide open you cannot suck up any fluid, but if you pout and compress the lips and then insert a tube you can easily suck up as much as you like. Again, cupping glasses are made concave for the purpose of drawing and pulling the flesh up within them, and there are other examples of this kind of thing. Among the inner organs of the body, the bladder, the skull and the womb have such a shape and it is well known that these organs specially attract moisture from other parts of the body and are always filled with fluid. On the other hand organs which are more spread out, although they hold fluid which flows into them well, do not attract it to the same extent. Further, the solid and round organs neither attract it nor hold it because there is nowhere for the fluid to lodge. Those which are spongy and of loose texture such as the spleen, the lungs and the female breasts easily absorb fluid from the nearby parts of the body and when they do so become hard and swollen. Such organs do not absorb fluid and then discharge it day after day as would a hollow organ containing fluid, but when they have absorbed fluid and all the spaces and interstices are filled up, they become hard and tense instead of soft and pliant. They neither digest the fluid nor discharge it, and this is the natural result of their anatomical construction. The organs of the body that cause flatulence and colic, such as the stomach and chest, produce noise and rumbling. For any hollow organ that does not become full of fluid and remain so but instead undergoes changes and movement, must necessarily produce noises and the signs of movement. The organs which are soft and fleshy tend to become obstructed and then they are liable to sluggishness and fullness. Sometimes an organ which is diseased comes up against some flat tissue which is neither strong enough to resist the force of the swollen organ nor sufficiently mobile to accommodate the diseased organ by yielding. For instance, the liver is tender,

full-blooded and solid and on account of these qualities is resistant to the movement of other organs. Thus wind, being obstructed by it, becomes more forceful and attacks the thing which obstructs it with greater power. In the case of an organ such as the liver, which is both full-blooded and tender, it cannot but experience pain. For this reason, pain in the hepatic area is both exceedingly severe and frequently encountered. Abscesses and tumours also occur very commonly here, as well as beneath the diaphragm. This latter condition, although less common, is more serious. The extent of the diaphragm is considerable and is opposed to other organs; nevertheless, its more sinewy and stronger nature makes it less liable to pain although both pains and tumours may occur in this region.

23. There are many individual variations in the shape of the different organs of the body from one person to another and they react differently both in health and in disease. There are large and small heads; thin and thick, long and short necks. The belly may be large and round; the chest narrow and flat. There are countless other differences and the effects of such variation must be known so that one can understand the exact cause when they become diseased. Only thus can proper care be given.

24. Again, the effect of each type of humour on the body must be learnt and, as I said before, their relationships with one another must be understood. I mean this sort of thing: if a sweet humour should change its nature, not by admixture with something else but spontaneously, what characteristic would it show? Bitter, salt, astringent or sharp? Sharp, I fancy. A sharp humour, compared with the others, would be specially inimical to the digestion of food. At least it would be so if, as we believe, a sweet humour is the most suited.

Thus, if anyone were able to light upon the truth by experiment outside the body, he would always be able to make the best pronouncements of all. The best advice is that which is least unsuitable.

EPIDEMICS, BOOK I

The Hippocratic Corpus contains seven books of a physician's case notes. They consist of descriptions of both individual cases and diseases epidemic in a specified place in a given period. Books I and III appear to be the earliest and most interesting, and date from the fifth century B.C.; the other five books are probably the work of at least two later authors.

(i)

1. There was much rain in Thasos about the time of the autumnal equinox and during the season of the Pleiads. It fell gently and continuously and the wind was from the south. During the winter, the wind blew mostly from the south; winds from the north were few and the weather was dry. On the whole the winter was like springtime; but the spring was cold with southerly* winds and there was little rain. The summer was for the most part cloudy but there was no rain. The etesian winds were few and light and blew at scattered intervals.†

Although the climate was generally southerly and dry, in the early spring there was a northerly spell, the very opposite of the previous weather. During this time a few people contracted *causus* without being much upset by it, and a few had haemorrhages but did not die of them. Many people suffered from swellings near the ears, in some cases on one side only, in others both sides were involved. Usually there was no fever and the patient was not confined to bed. In a few cases there was slight fever. In all cases the swellings subsided without harm and none suppurated as do swellings caused by other disorders. The swellings were soft, large and spread widely; they were unaccompanied by inflammation or pain and they disappeared leaving no trace. Boys, young men and male

*Possibly a copyist's error for 'northerly'.

†The etesian winds blow from the north-west for forty days in the summer.

adults in the prime of life were chiefly affected and of these, those given to wrestling and gymnastics were specially liable. Few women took it. Many patients had dry, unproductive coughs and hoarse voices. Soon after the onset of the disease, but sometimes after an interval, one or both testicles became inflamed and painful. Some had fever, but not all. These cases were serious enough to warrant attention, but for the rest, there were no illnesses requiring care.

2. During the period beginning in early summer and lasting into the winter, many patients with long-standing consumption took to their beds, for in many cases in which the diagnosis had been dubious, it was then confirmed. Some whose constitution showed a tendency towards consumption first began to suffer from the disease at that time. Many died including most of the latter, and of those who took to their beds I doubt if any survived even a moderate time. Death occurred more quickly than is usual in such cases. Other diseases, even the longer ones and those accompanied by fever, proved neither serious nor fatal; these will be described later. Only consumption was widespread and caused a large number of deaths.

In the majority of cases the course of the disease was as follows. There was fever, attended by shivering, of continuous, severe and usually non-remittent type. However the fever showed some variation of tertian periodicity. Thus one day the fever would be less severe, the next day the fever would be higher and so on, but in general becoming worse with time. The patients showed continuous sweating but the whole of the body was not involved. The extremities were often cold and could be warmed only with difficulty. Their stomachs were disordered and the stools small, bilious, not homogeneous, fluid and pungent, causing the patient to get up frequently. The urine was either thin, colourless and undigested, or thick with a slight sediment which did not settle easily but was, as it were, raw and unripe. Cough was slight but frequent, and little was coughed up and that only with difficulty. In the most violent cases, there was no progress towards ripening of the sputum and the patients continued to cough it up raw. In most of these cases the throat was painful,

red and inflamed from the first and continued so. The stools were small, thin and pungent. The patients rapidly became worse and wasted away, refusing to take food and having no thirst. Many became delirious shortly before death.

3. While it was still summer and during the autumn there were also many cases of fever apart from consumption. These were continuous but not violent and, though those affected were ill for a long time, they suffered nothing in other respects for their stomachs generally remained in good order and they took no harm worth speaking of. Usually the urine was clear and of a good colour but thin, becoming ripened later about the time of the crisis. There was not too much coughing, nor did the patients have much trouble with the cough. They retained their appetites and it was quite permissible to give them food. Generally they were only slightly ill and showed none of the fevers attended with shivering suffered by consumptive patients, and little sweating. The paroxysms of fever were irregular, being at different intervals in different cases. In the shortest illnesses, the crisis occurred at about the twentieth day, in most cases at about the fortieth and in a number at about the eightieth. In some cases the fever resolved at a time different from those given above without reaching a crisis. In most of these the fever returned after a short interval and the crisis was reached in one of the usual periods. In many cases the malady was so protracted that it lasted into the winter.

Of all the diseases described in this section, only consumption proved fatal. The course of the remainder was smooth and no deaths occurred from the other fevers.

(ii)

4. There was unseasonably wintry weather in Thasos early in the autumn, and rainstorms suddenly burst to the accompaniment of northerly and southerly winds. This happened during the season of the Pleiads until their setting. The winter was northerly and there was much rain, with frequent heavy showers, as well as snow. Usually there were bright intervals

as well, and the cold weather could not be regarded as unseasonable. However, immediately after the winter solstice when the west wind usually begins to blow, the great storms returned with gales from the north, and snow and rain fell continuously from a sky full of racing clouds. This continued without a break until the equinox. The spring was cold with northerly winds accompanied by cloudy skies and much rain. The summer was not too scorching for the etesian winds blew steadily, but heavy rain followed again soon after the rising of Arcturus.

5. The whole year then was wet, cold and northerly. The winter was healthy for the most part but early in the spring a good few, in fact most people, fell sick. Ophthalmia was the first disease to make its appearance, being accompanied by pain, moist discharge and without suppuration. Many people had small styes break out which gave them trouble. Most relapsed but were finally cured late in the year towards autumn. During the summer and the autumn there were cases of dysentery, tenesmus and diarrhoea. Further, there were cases of bilious diarrhoea in which the stools were copious, thin, raw and sometimes watery and painful to pass. There were also many cases of discharges accompanied by strangury and a painful, bilious, watery discharge containing particles and pus. There was no disease of the kidneys (in these cases). Cases were seen in which there was vomiting of phlegm, bile and undigested food. Sweating occurred and the patients became flaccid all over. Often there was no fever and the patients were not confined to bed, but in many other cases which will be described there was fever. Those who exhibited all the symptoms to be mentioned were consumptive and suffered pain. During the autumn and on into the winter there were cases of continued fever, in a few cases *causus*, diurnal and nocturnal fevers, roughly tertian and exact tertian fevers, quartans and fevers of no regular form. There were many cases of each of the fevers about to be described.

6. *Causus* was the least frequent of these fevers and those affected by it suffered the least. There was no bleeding, except in a very few cases and then only very slight; nor was there

any delirium and in other respects all went well. The crisis was regularly attained, usually on the seventeenth day including the days of intermission. I knew of no case of *causus* which was fatal or which was complicated by brain-fever.

The tertian fevers were more common than *causus* and more troublesome. In all cases of this fever four periods regularly elapsed from the time the malady was contracted and the final crisis was reached after seven paroxysms. None suffered from relapses.

The quartan fevers showed, in many cases, their quartan nature from the start. In not a few cases, however, they emerged as quartans only on the departure of other fevers and ailments. As is usual they were long protracted, perhaps even more than usual.

There were many cases of quotidian, nocturnal and irregular fever; they lasted a long time whether the patients were confined to bed or not. In most cases the fever lasted through the season of the Pleiads until the winter. Often the disease was accompanied by convulsions, especially in the case of children when the fever was, at first, slight. Convulsions also sometimes followed the fever. Although these maladies were protracted, they were not usually serious unless the patient was already likely to die from some other cause.

7. The worst, most protracted and most painful of all the diseases then occurring were the continued fevers. These showed no real intermissions although they did show paroxysms in the fashion of tertian fevers, one day remitting slightly and becoming worse the next. They began mildly but continually increased, each paroxysm carrying the disease a stage further. A slight remission would be followed by a worse paroxysm and the malady generally became worse on the critical days. Although all patients suffering from these various fevers showed shivering fits at irregular times, such fits were least frequent and most irregular in patients with these continued fevers. Again, the fevers generally were attended with many fits of sweating but in cases of continued fever they were infrequent and brought harm rather than relief. In continued fever, too, the extremities were chilled and could

only be warmed with difficulty, and insomnia was followed by coma. In the fevers generally, digestion was disturbed and difficult but this was most marked in these cases of continued fever. In them, too, the urine was either: (*a*) Thin, raw and colourless, becoming slightly more concocted at a crisis, (*b*) thick, but cloudy rather than forming sediment, or (*c*) of small quantity, bad and forming a raw sediment. Urine of this last variety was the most serious. Cough accompanied the fever, but I have no instance to record of a cough being either harmful or helpful.

8. These various symptoms [in cases of continued fever] were usually long-lasting, distressing and occurred without any order or regularity. In the majority of cases there was no crisis, whether or not the case was desperate. Some showed a brief respite but a relapse quickly followed. In a few cases a crisis occurred not earlier than the eightieth day but in some of these there was a relapse so that the majority of cases lasted on into the winter. Generally the disease resolved without a crisis, and this absence of crisis was equally marked both in those who recovered and those who did not.

These cases of [continued] fever, although they showed this characteristic of not reaching a crisis, were otherwise very varied. The most important and most ominous sign, which in the end was seen in most cases, was complete loss of appetite. This was specially marked in those whose condition was already desperate in other respects. Further, these febrile patients showed no greater desire for water than they would normally. Abscesses formed in those cases in which the illness was very prolonged and attended by much pain and loss of weight. These were so large, in some cases, as to be insufferable, while others were too small to be any good so that the patient soon returned to his former condition and deterioration was hastened.

9. This disease was commonly complicated by dysentery, tenesmus and diarrhoea. Some patients showed dropsy with or without these other symptoms. A violent attack of any of these complications quickly proved fatal; less severe attacks did no good. The disease was sometimes accompanied by

transient eruptions, quite out of keeping with the scale of the disease, and by swellings near the ears which slowly absorbed and signified nothing. In some cases similar swellings occurred in the joints, especially the hips. Usually in such cases a crisis was reached in a few days and the swelling disappeared, only to regain a hold and quickly return to the original state.

10. All the diseases described caused death, but the greater number was among those suffering from this continued fever and especially children, including infants, older children (eight and ten year olds) and those approaching puberty. The complications described latterly were invariably accompanied by the general symptoms of the disease as at first described. On the other hand, many who suffered from these symptoms did not suffer the complications. The most important sign, and the only good one, which saved many who were in the gravest danger, was when strangury occurred and a local abscess was produced. Strangury, in these conditions, occurred most commonly at the ages mentioned above but in many other cases as well, both when the patient was confined to bed and when he was not. In those who showed this symptom, a rapid and violent change took place, for the belly, even though it might have been malignantly moist, rapidly became firm, while the patient's appetite for all kinds of food fully returned and the fever thereafter was mild. But even in these cases, the strangury lasted long and was painful, the urine being copious, thick, varied, red, mixed with pus and passed with pain. Nevertheless, all these patients recovered; I do not know of one who died.

11. Whenever there is danger, watch out for all ripe discharges that flow from every part of the body at their due times and for favourable and critical abscess formation. Ripeness shows that the crisis is at hand and that recovery is certain. On the other hand, what is raw and immature, as well as unfavourable abscess formation, denotes the failure to reach a crisis, pain, prolongation of the malady, death or relapse. To decide which course is likely you must consider other things too. Consider what has gone before, recognize the signs before your eyes and then make your prognosis. Study

these principles. Practise two things in your dealings with disease: either help or do not harm the patient. There are three factors in the practice of medicine: the disease, the patient and the physician. The physician is the servant of the science, and the patient must do what he can to fight the disease with the assistance of the physician.

12. Headache and pains in the neck, and a feeling of heaviness accompanied by pain, may occur both in the presence and in the absence of fever. Those suffering from brain fever have convulsions and vomit brownish-red material and some of these die rapidly. If a patient has a pain in the neck, heaviness in the temples, dimness of vision and contraction of the hypochondrium without pain, he will have an epistaxis, both in *causus* and in other fevers. If his whole head is heavy or he feels heartburn and nausea, he will vomit bilious and phlegmatic matter. In these diseases, convulsions are more common among children, both convulsions and uterine pain occur in women, while older patients and all whose warmth is disappearing suffer from paralysis, madness or loss of sight.

(iii)

13. A little before the rising of Arcturus and during its season there were many violent rainstorms in Thasos accompanied by northerly winds. About the time of the equinox and until the setting of the Pleiads, the winds were southerly, so little rain fell. The winter was northerly with periods of drought, cold, high winds and snow. There were very severe storms at the time of the equinox. The spring was northerly, dry, with little rain, and it was cold. There was little rain at the time of the summer solstice but instead a severe cold spell set in and lasted till the [rising of the] Dog Star. Thence, until the [rising of] Arcturus, the summer was hot. This hot spell began suddenly and was both continuous and severe. There was no rain and the etesian winds blew. About the time of Arcturus, southerly rains began and continued until the equinox.

14. Under such circumstances, cases of paralysis started to

appear during the winter and became common, constituting an epidemic. Some cases were swiftly fatal. In other respects health remained good. Cases of *causus* were encountered early in the spring and continued past the equinox towards summer. Most of those who fell sick in the spring or at the very beginning of summer recovered, though a few died. In the autumn, when the rains came, the disease was more fatal and the majority of those that took it died.

It was a peculiarity of *causus* that a good copious epistaxis often proved a cure, and I do not know of any in these circumstances who died if they had a good epistaxis. For Philiscus, Epameinon and Silenus had a small epistaxis on the fourth and fifth days; they died. Most of those who were sick had shivering attacks about the time of the crisis, especially those who did not have epistaxis. Such patients also had attacks of sweating.

15. Some cases of *causus* developed jaundice on the sixth day and these were assisted by the evacuation of urine, abdominal disturbance or by a profuse haemorrhage, such as Heracleides (who lay at Aristocydes' house) had. Moreover in this case he did not only have epistaxis but trouble in the belly and diuresis as well. He reached a crisis on the twentieth day. The servant of Phanagoras was not so lucky; he had none of these things happen to him and he died.

Most patients suffered from haemorrhage and especially was this the case in youths and young men. Indeed, of the latter who did not have a haemorrhage, most died. In older people the disease turned to jaundice or their bellies were upset, as was the case of Bion, who lay at Silenus' house. During the summer, dysentery became epidemic and those who had not recovered by that time had their sickness end up as a sort of dysentery, even when they had had a haemorrhage. This happened to Myllus and to Erato's slave whose illness, after a copious haemorrhage, turned to a sort of dysentery; they survived.

In fact, in this disease, this fluid was peculiarly abundant. Even those who did not bleed about the time of the crisis suffered pain and passed thin urine at this time and then began

to bleed slightly about the twenty-fourth day, and there was pus mixed with the blood. In the case of Antiphon the son of Critobulus this finally ceased and the ultimate crisis was reached about the fortieth day. Such cases showed hard swellings near the ears which absorbed and were followed by a heaviness in the left flank and in the region of the iliac crest.

16. Many women were sick, but fewer women than men, and the disease in them was less fatal. Childbirth was often difficult and was followed by disease. These cases were specially fatal as, for instance, in that of the daughter of Telebulus, who died on the sixth day after giving birth. In most cases bleeding from the womb occurred during the fever and in many girls it occurred for the first time, but some had epistaxis. In some cases both bleeding from the womb and epistaxis were observed. For instance, the daughter of Daitharses who was a virgin not only had uterine bleeding for the first time then but also had a violent discharge of blood from the nose. I know of no case which proved fatal if either of these complications ensued. So far as I know, all who fell ill while pregnant aborted.

17. Generally in this disease the urine was of good colour but thin with a slight sediment. The belly was disordered, the stools being thin and bilious. In many cases, after a crisis had been reached for other disorders, the malady ended up as dysentery, as happened to Xenophanes and Critias. I will record the names of those patients who had watery, copious and fine urine, even after the crisis, with a healthy sediment, and who had a favourable crisis in other respects too. They were Bion, who lay at the home of Silenus; Cratis, who was at the house of Xenophanes; the slave of Areto, and the wife of Mnesistratus. All these subsequently suffered from dysentery.

About the time of Arcturus many reached the crisis on the eleventh day and they did not suffer the expected relapses. About this time, especially in children, the malady was associated with coma and these cases were the most rarely fatal of all.

18. *Causus* lasted on to the equinox, up to the setting of the Pleiads, and even into the winter. But at this time brain fever

became prevalent and most of its victims died. A few similar cases were also seen during the summer. Those suffering from fever of the *causus* type which proved fatal showed certain additional symptoms even at the beginning of the illness. High fever attended the beginning of the illness along with slight shivering fits, insomnia, thirst, nausea and a little sweating about the forehead and over the clavicles (in no case all over), much delirium, fears and despondency, while the extremities such as the toes were chilled, but especially the hands. Paroxysms occurred on even days. Generally, pain was greatest on the fourth day and the sweat was cold. Their extremities did not regain warmth but remained cold and livid, and they no longer suffered from thirst. They passed little urine, which was black and fine, and became constipated. In none of these cases was there a discharge of blood from the nose but only a few drops. Nor did these cases show any remission but died on the sixth day, sweating. Those patients who developed brain fever had all the above symptoms, but the crisis usually took place on the eleventh day. Where brain fever was not present at the beginning but appeared on the third or fourth day, the crisis did not take place until the twentieth day. In these the illness was moderate in its severity at first but became severe about the seventh day.

19. The disease was very widespread. Of those who contracted it death was most common among youths, young men, men in the prime of life, those with smooth skins, those of a pallid complexion, those with straight hair, those with black hair, those with black eyes, those who had been given to violent and loose living, those with thin voices, those with rough voices, those with lisps and the choleric. Many women also succumbed to this malady. During this epidemic there were four signs which betokened recovery: a considerable epistaxis, a copious discharge of urine that contained a lot of favourable sediment, biliousness and disorders of the belly coming on at a favourable time, or if there were dysentery. In many cases the crisis was not reached upon the appearance of one of the symptoms described, but instead the symptoms appeared successively and the patients seemed to be in a very

bad way. But in every such case they recovered. All these symptoms were seen in women and girls and if either any of them appeared or there was copious uterine haemorrhage, it proved their salvation and brought on the crisis. I do not know of any woman who died in which one of these signs had properly appeared. However, the daughter of Philo had a severe epistaxis, but she dined rather intemperately on the seventh day of her sickness; she died.

If a patient weeps in spite of himself in acute fever of the type of *causus*, you must expect an epistaxis, even if there is no other reason to expect a fatal outcome. If a patient be poorly, it portends not haemorrhage but death.

20. Swelling near the ears which sometimes accompanied fevers did not always subside or suppurate when the fever was resolved by crisis, but subsided following bilious diarrhoea or dysentery or by the formation of sediment in the urine as happened in the case of Hermippus of Clazomenae. The times of the crises in these fevers, which is the thing by which we distinguish them, were sometimes an even and sometimes an odd number of days. Thus, two brothers who lay near the summer residence of Epigenes fell sick at the same time. The elder reached a crisis on the sixth day, the younger on the seventh. Both relapsed at the same time following an intermission of five days. After the relapse they reached a crisis together on the seventeenth day from the beginning of the illness. Generally the crisis was attained on the sixth day and, following an intermission of six days, a second crisis was reached on the fifth day of the relapse. In some cases the crisis took place on the seventh day, the intermission lasted seven days and the relapse reached its crisis in three days. In others, the crisis occurred on the seventh day, and a second on the seventh day of the relapse which followed three days' intermission of fever. In some cases a crisis took place on the sixth day, the remission lasted six days and this was followed by three days' relapse, a remission of one day, a relapse of one day and finally the crisis. This happened to Evagon, the son of Daitharses. In other cases, a crisis took place on the sixth day, the remission lasted seven days with crisis on the fourth day

of the relapse, as happened to the daughter of Aglaïdas. The majority of those who caught this epidemic passed their illness in the manner described and I know of none that survived who did not have a relapse in the normal way. All who had relapses of this sort recovered so far as I know. Further, to my knowledge, none whose malady proceeded in this manner subsequently suffered a return of the disease.

21. In these fevers, death usually took place on the sixth day, as happened in the case of Epaminondas, Silenus and Philiscus the son of Antagoras. Those who had a swelling near the ears had a crisis on the twentieth day but in all cases it subsided without suppuration, being voided in the urine. Cratistonax, who lived near the temple of Heracles, and the servant girl of Scymnus the fuller developed abscesses; they died. In some cases the crisis was on the seventh day, and following nine days' remission the fever recurred and reached its crisis on the fourth day after the recurrence; this happened in the case of Pantacles who lived near the temple of Dionysus. Sometimes the first crisis was on the seventh day, the remission lasted six days and a crisis was reached on the seventh day of the recrudescence; this happened in the case of Phanocritus who lay at the home of Gnathon the fuller.

22. During the winter, from about the time of the winter solstice till the equinox, *causus* and brain fever continued, and there were many deaths. There was, however, a change in the periods at which the crisis occurred, it taking place usually on the fifth day from the beginning of the illness. A remission of four days would be followed by a relapse with the crisis on the fifth day, that is on the fourteenth day of the illness. Most of those who behaved in this way were children, but it happened occasionally in adults. In some cases a crisis occurred on the eleventh day, a relapse on the fourteenth and the final crisis on the twentieth. But if shivering fits supervened about the twentieth day, the crisis took place on the fortieth. Most patients suffered from shivering fits about the time of the first crisis, and those who had them then also had them at the time of the crisis of the relapse. Very few had shivering fits during the spring, more had them during the summer, still more

during the autumn but by far the greatest number during the winter. Cases of haemorrhage gradually ceased.

23. The factors which enable us to distinguish between diseases are as follows: First we must consider the nature of man in general and of each individual and the characteristics of each disease. Then we must consider the patient, what food is given to him and who gives it – for this may make it easier for him to take or more difficult – the conditions of climate and locality both in general and in particular, the patient's customs, mode of life, pursuits and age. Then we must consider his speech, his mannerisms, his silences, his thoughts, his habits of sleep or wakefulness and his dreams, their nature and time. Next, we must note whether he plucks his hair, scratches or weeps. We must observe his paroxysms, his stools, urine, sputum and vomit. We look for any change in the state of the malady, how often such changes occur and their nature, and the particular changes which induce death or a crisis. Observe, too, sweating, shivering, chill, cough, sneezing, hiccough, the kind of breathing, belching, wind, whether silent or noisy, haemorrhages and haemorrhoids. We must determine the significance of all these signs.

24. Some fevers are continuous, others come at day and remit at night; others for the night, remitting by day. There are sub-tertian, tertian and quartan fevers, five-day, seven-day and nine-day fevers. The most severe, serious, troublesome and fatal maladies produce continued fevers. The safest, easiest to bear and yet longest of all is the quartan fever, not only from its own nature but also because it puts an end to other serious illnesses. What is termed sub-tertian fever can occur in acute illnesses, and it is the most fatal of all; but consumption and other protracted diseases are especially prone to take this form. Nocturnal fever is not especially fatal but it is long drawn out. Diurnal fever is longer still and sometimes leads to consumption. The seven-day fever is long-lasting but not fatal. The nine-day fever is still longer but not fatal. An exact tertian fever soon produces a crisis and is not fatal. The five-day fever is the worst of all, for when it comes on before

consumption or when the patient be already consumptive, it is fatal.

25. Each of these fevers has its characteristics, both in the nature of the fever and the spacing of the paroxysms. For example, a continued fever in some cases rapidly attains its height and then the fever diminishes as the crisis is approached and is passed. In other cases it begins gently without producing obvious signs, increasing day by day paroxysmally until at the crisis it fairly shines out. In other fevers, the start is mild but the fever increases in paroxysms to its height and then persists until the crisis be reached and passed. These different signs may be displayed by any fever or sickness. Before deciding on treatment, you must also consider the patient's mode of life. There are also many other signs of importance to be considered in these conditions; some have already been described elsewhere, others await description. They must all be taken into account in deciding whether the patient will have a short or protracted illness, a fatal outcome or cure. Similarly these things will have to be considered in deciding what treatment to adopt and the nature, quantity and time of administration of medicaments.

26. Fevers attended by paroxysms at even numbers of days, reach their crisis also in an even number; if the paroxysms are on odd days, so is the crisis. The first period [of fever] in those maladies which reach the crisis in an even number of days is 4, 6, 8, 10, 14, 20, 24, 30, 40, 60, 80, or 120 days. If the crisis be reached in an odd number, then the first period lasts 3, 5, 7, 9, 11, 17, 21, 27 or 31 days. It must be noted that if a crisis occurs on any other day than those mentioned, there will be a relapse and also it may prove a fatal sign. One must pay attention to these days which have been specified in the course of a particular fever and realize that on them a crisis may take place leading to recovery or death, to improvement or to deterioration. In irregular fevers, quartans, five-, seven-, and nine-day fevers, one must also take note of the periodicity with which the crises occur.

FOURTEEN CASES

(i)

Philiscus lived near the city wall. He took to his bed on the first day of his illness with high fever and sweating and passed an uneasy night.

On the second day all the symptoms became more pronounced, and later in the day his bowels were well opened following the administration of an enema. He spent a quiet night.

Third day: in the early morning and until midday he appeared to be without fever: towards evening, a high fever with sweating, thirst, a parched tongue and he passed dark urine. Spent a restless night without sleeping and was quite out of his mind.

Fourth day: symptoms more pronounced; urine dark. An easier night; urine a better colour.

Fifth day: about midday a slight epistaxis of pure blood; urine not homogeneous but containing globular particles suspended in it, like semen, which did not settle. Following the giving of a suppository, passed small stools with flatulence. Night uneasy, short snatches of sleep, talking, delirium, extremities all cold and could not be warmed, passed dark urine, slept a little towards daybreak, lost his voice, cold sweating, extremities livid.

About midday on the sixth day he died.

Throughout he took deep infrequent breaths as if consciously controlling his breathing. The spleen was enlarged and presented as a round lump; cold sweats all through the illness. The paroxysms were on even days.

(ii)

Silenus lived on the flat ground near Evalcidas' place. He took a fever as the result of fatigue, drink and untimely exercise. He started with a pain in the loins, heaviness of the head and retraction of the neck.

On the first day, stools copious, bilious and not homogeneous; frothy and dark-coloured. Urine dark with a dark sediment; thirst, tongue dry; did not sleep that night.

Second day: high fever, stools more copious, thinner and frothy; urine dark. Passed a restless night, slight delirium.

Third day: all symptoms more pronounced; contraction of the hypochondrium on both sides extending as far as the navel, somewhat flabby underneath the contraction. Stools thin and somewhat dark in colour; urine cloudy and rather dark. No sleep that night, much talking, laughter, singing, could not be restrained.

Fourth day: condition unchanged.

Fifth day: stools unmixed, bilious, smooth and fatty; urine thin and clear; showed slight signs of understanding.

Sixth day: slight sweating about the head, extremities cold and livid, much tossing about, complicated with constipation and suppression of urine, high fever.

Seventh day: lost his voice, extremities could no longer be warmed, anuria and retention of stools continued.

Eighth day: cold sweating all over, accompanied by spots. These were red, round and small like those of acne which did not go down. A thin copious stool, as if undigested, was passed with difficulty following a small enema. The urine was passed with pain and was pungent; extremities became slightly warm, periods of light sleep, signs of coma, loss of voice, urine thin and clear.

Ninth day: condition unchanged.

Tenth day: would not take drink, comatose, periods of light sleep; stools the same, passed a large quantity of rather thick urine which formed a white sediment like barley-meal on standing. Extremities again cold.

Eleventh day: he died.

From the beginning and throughout the illness he took deep infrequent breaths. Continuous pulsation of the hypochondrium. Age about twenty.

(iii)

Herophon suffered from a high fever. Stools small with tenesmus at first; afterwards he passed thin bilious matter rather frequently. He could not sleep, urine dark and thin.

Early on the fifth day, became deaf, all the symptoms were more pronounced, the spleen became enlarged, the hypochondrium contracted; he passed a small quantity of dark matter from his bowels. He was delirious.

Sixth day: babbling at random, at night sweating, became cold, remained delirious.

Seventh day: became cold, thirsty, out of his mind. Regained control of his mind during the night and slept.

Eighth day: fever; the spleen was reduced in size and he was wholly lucid. He felt a pain at first in the groin on the same side as the spleen, later on pains in the calves of both legs. Passed a comfortable night. Urine of better colour with a slight sediment.

Ninth day: sweating, the crisis was reached and the fever left him.

On the fifth day after this a relapse occurred. The spleen immediately enlarged; high fever, deafness again. On the third day of the relapse the spleen became reduced, the deafness less; pain in the legs; sweating during the night. A crisis was reached about the seventeenth day. There was no delirium during the relapse.

(iv)

In Thasos, the wife of Philinus, having given birth to a daughter fourteen days previously, the lochia being normal and the patient doing well, was taken ill with a fever accompanied by rigors. At first she felt a pain in the heart and in the right hypochondrium; pains in the genitalia; the lochia ceased. When a pessary was applied these pains were eased, but the pains in the head, neck and loins remained. No sleep, extremities cold, thirst, belly dried up, passed small stools, urine thin and of bad colour at first.

On the sixth night, a long attack of delirium followed by lucidity.

Seventh day: thirst, small bilious dark-coloured stools.

Eighth day: further rigors, high fever, a large number of painful convulsions, much talking at random. An enema produced copious bilious stools. Sleep not possible.

Ninth day: convulsions.

Tenth day: slight recovery of senses.

Eleventh day: slept, remembered everything, but very soon became delirious again. Passed much urine spontaneously accompanied by frequent convulsions; the urine was thick and white, looking like urine with a sediment which has been stirred up, but when it was left standing a long time it did not in fact produce a sediment and resembled in colour and thickness the urine of cattle. I myself examined the urine.

About the fourteenth day, a throbbing throughout the body, a lot of talking, slight lucidity rapidly followed by renewed delirium.

About the seventeenth day she became speechless and died on the twentieth day.

(v)

The wife of Epicrates, who lived near the statue of the founder, was said to have had a violent shivering fit about the time of childbirth, and could not get warm. The severe symptoms continued on the next day.

On the third day she gave birth to a daughter and parturition was normal.

On the second day after the delivery she had a high fever with pains in the heart and in the genitals which were eased by the application of a pessary. But she continued to suffer from pains in the head, neck and loins. Sleep was impossible. Her stools were small, thin, bilious and not homogeneous; urine thin and rather dark.

On the night of the sixth day of the fever she became delirious.

The symptoms became more pronounced on the seventh

day; insomnia, delirium, thirst, dark-coloured bilious stools.

Eighth day: rigors occurred, she slept rather more.

Ninth day: no change.

Tenth day: painful aching in the legs, pain recurred in the heart, headache, no delirium, slept more, bowels constipated.

Eleventh day: passed a lot of urine of good colour which produced a sediment. Was rather better.

Fourteenth day: rigors, high fever.

Fifteenth day: vomited yellow bilious matter rather frequently, sweated and became feverish; at night high fever again, urine thick with a white sediment.

Sixteenth day: a paroxysm, restless night, no sleep, delirium.

Eighteenth day: thirst, tongue parched, no sleep, a lot of delirium, pains in the legs.

About the twentieth day, slight rigors early in the morning, coma, slept restfully, vomited a small quantity of bilious dark matter, deafness at night.

About the twenty-first day, a painful heaviness all down the left side; coughed up a small amount. Urine thick, cloudy and reddish; did not form a sediment when left standing. An improvement in other respects but the fever continued. From the beginning of the illness the throat was painful and inflamed with the uvula retracted, and there was a pungent acrid salty discharge.

About the twenty-seventh day, no fever, a sediment in the urine, slight ache in the side.

About the thirty-first day the fever returned and the bowels were disordered, the stools bilious.

On the fortieth day she vomited a small quantity of bilious matter.

The final crisis and the end of the fever was reached on the eightieth day.

(vi)

Cleanactides, who lived on the hill above the temple of Heracles, was taken ill with an irregular fever. From the beginning he suffered from headache and pain in the left side; the rest of the body ached as it might from fatigue. The

paroxysms of fever occurred in no regular sequence, but sometimes in one fashion, sometimes another. Sometimes there was sweating; sometimes not. Generally paroxysms were specially in evidence on the critical days.

About the twenty-fourth day he suffered from pain in the finger-tips and vomited, at first yellow bilious material, later rust-coloured matter. He was relieved of everything.

About the thirtieth day he began to bleed from both nostrils and slight epistaxis continued until the crisis. He did not suffer at all from lack of appetite, thirst or insomnia. Urine was thin, but not of a bad colour.

About the fortieth day he passed reddish urine with a large amount of red sediment. His condition improved. Subsequently the nature of the urine was varied; sometimes it had a sediment, sometimes none.

On the sixtieth day the urine contained a lot of white smooth sediment. All the symptoms decreased and the fever left him; the urine again became thin but of good colour.

On the seventieth day, fever followed by ten days' remission.

On the eightieth day, rigors and high fever; he sweated a lot, and the urine contained a red smooth sediment. Eventually the final crisis was reached.

(vii)

Meton suffered from a fever with a painful heaviness in the loins.

Second day: he took frequent drinks of water and his bowels were well opened.

Third day: heaviness in the head; the stools thin, bilious and reddish.

Fourth day: symptoms more pronounced; on two occasions he had an epistaxis from the right nostril. Passed a restless night; stools as on the third day; urine rather dark in colour and containing suspended particles which did not settle on standing.

Fifth day: a copious epistaxis from the left nostril of pure blood, sweating; the crisis was reached.

After the crisis, he had insomnia and delirium while his urine was thin and rather dark. He had his head bathed, slept and regained his wits. He did not relapse but he had many attacks of epistaxis following the crisis.

(viii)

Erasinus lived near the gully of Boötes. He was taken ill with fever after dinner and passed a disturbed night.

The first day was restful; was distressed during the night.

Second day: all symptoms more pronounced, delirium at night.

Third day: painful, much delirium.

Fourth day: worst of all so far; did not sleep at all at night. Visual hallucinations, delirium. These were followed by even more marked disturbances, feelings of fear and his illness was very severe.

Fifth day: in the early morning he became lucid and quite regained possession of his wits. But some time before noon he became mad and could not be restrained; extremities cold and somewhat livid. Suppression of urine. He died about sunset.

He had fever throughout the illness accompanied by sweating. The hypochondrium was distended and contracted only with pain. The urine was dark containing suspended globular particles which did not form a sediment on standing. His bowels remained open and he passed solid stools. Thirst throughout was not excessive. He had many convulsions accompanied by sweating about the time of death.

(ix)

Crito in Thasos had a violent pain in the foot which came on while walking; it started from the big toe. The same day he took to his bed with shivering, nausea and slight fever; at night he became delirious.

Second day: the whole foot became swollen; it was reddish about the ankle where there was some contraction and small

black blisters appeared. He developed high fever and madness. He passed rather frequent unmixed bilious stools.

He died on the second day from the beginning of his illness.

(x)

The man from Clazomenae, who was dwelling near the well of Phrynichides, took a fever. From the beginning he had headache and aching pains in his neck and loins. Deafness was present from the start; sleep was impossible. High fever developed, the hypochondrium was distended but not excessively so, distension, tongue dry.

On the night of the fourth day he became delirious.

Fifth day: bad.

Sixth day: all symptoms more pronounced.

About the eleventh day a slight relief.

From the beginning of the illness until the fourteenth day the stools were thin, bile-stained and copious. Then the bowels became constipated. The urine throughout, although thin, was copious and of a good colour and contained scattered particles which did not settle.

About the sixteenth day he passed slightly thicker urine which formed a small amount of sediment. He became a little better and more lucid.

On the seventeenth day the urine became thin again and painful swellings by both ears appeared. Sleep was impossible; he was delirious and suffered from pain in the legs.

On the twentieth day he attained the crisis and lost his fever; he did not sweat, became completely lucid.

About the twenty-seventh day he had a violent pain in the right hip which quickly ceased. The swellings near the ears neither suppurated nor resolved, but remained painful.

About the thirty-first day, diarrhoea started; the stools were very watery with some evidence of dysentery. He passed thick urine. The swellings by the ears went down.

On the fortieth day his right eye ached and his sight became impaired; this trouble passed off.

(xi)

The wife of Dromeades, having given birth to a daughter and progressing in all other respects normally, was seized by rigors on the second day, accompanied with high fever.

A pain started on the subsequent day in the hypochondrium; nausea and shivering supervened. She did not sleep on succeeding days and was distraught. Breathing deep and slow, each breath immediately drawn back again.

On the second day after the rigors, her stools were normal; the urine thick, white and cloudy, of the appearance of urine with sediment which has been stirred up after standing a long while. But in her case no sediment was formed. She did not sleep at night.

Third day: about noon rigors, a high fever, urine as before, pain in the hypochondrium, nausea. A restless night with insomnia. Generalized cold sweats, but soon followed by warmth again.

Fourth day: slight relief of the pain in the hypochondrium, a heavy headache. Fell into a stupor; a slight epistaxis occurred. Tongue dry, thirst. Urine little, thin and oily. Slept a little.

Fifth day: thirst, nausea; character of urine unchanged, constipated. About noon much delirium followed quickly by a lucid phase. On going to stool she became comatose and chilled, slept during the night but was delirious.

Early on the sixth day she suffered from rigors followed quickly by fever and generalized sweating; the extremities were cold and she was delirious with a slow rate of breathing. After a little while convulsions supervened starting in the head and death soon followed.

(xii)

A man dined when heated and drank too much. During the night he vomited everything up; high fever, pain in the right hypochondrium with a soft inflammation therein; a restless night. Urine at first was thick and red and did not

sediment when left to stand. Tongue dry but no excessive thirst.

Fourth day: high fever; generalized pain.

Fifth day: passed a large amount of smooth oily urine. High fever.

Sixth day: towards evening, much delirium. Insomnia.

Seventh day: all symptoms more pronounced. Urine as before; very talkative and could not be restrained. Following an enema he passed a liquid disturbed stool containing worms. A bad night; rigors in the early morning. High fever with warm sweating, then appeared to lose the fever. He did not sleep much and was chilled after sleeping. Expectoration. In the evening much delirium and after a short while vomited a small amount of black bilious matter.

Ninth day: chilled, much delirious babbling, insomnia.

Tenth day: pains in the legs, all symptoms more pronounced, delirium.

Eleventh day: death.

(xiii)

A woman who lived on the sea-front was seized with a fever while in the third month of pregnancy. She was immediately seized with pains in the loins.

On the third day, pain in the head, neck and round about the right clavicle. Very shortly the tongue became unable to articulate and the right arm was paralysed following a convulsion as happens in hemiplegia. Her speech was delirious. A restless night with insomnia; the bowels were disordered and the stools were small, bilious, and unmixed.

Fourth day: speech was indistinct but she was no longer paralysed, convulsions. Pains continued as before and there was a painful swelling near the hypochondrium. She did not sleep and was completely delirious. Bowels disordered; urine thin and not of a good colour.

Fifth day: high fever; pain in the hypochondrium, completely delirious. Stools bilious. At night she sweated and the fever left her.

Sixth day: lucid; a general improvement; pain persisted in the region of the left clavicle. Thirst, thin urine, insomnia.

Seventh day: trembling, fell into a stupor with slight delirium. Aching persisted about the clavicle and in the left upper arm, but in other respects her condition improved and she was fully lucid. The fever intermitted for three days.

On the eleventh day a relapse occurred with rigors and fever.

About the fourteenth day she vomited yellow bilious material rather frequently; sweating. Reached a crisis and the fever left her.

(xiv)

Melidia, who lay near the temple of Hera, began to suffer from violent headache and pain in the neck and chest. She was at once seized with a fever. There was some vaginal discharge. The pain from which she suffered was continuous.

Sixth day: fell into a coma, nausea, shivering, a rash appeared on the face, slightly delirious.

Seventh day: sweating. The fever declined but the pain remained. The fever returned; short snatches of sleep.

Urine was of good colour throughout but thin. The stools were thin, bilious and pungent, small in quantity, dark and offensive. The urine contained a white smooth sediment. Sweating took place. The final crisis was reached on the eleventh day.

EPIDEMICS, BOOK III

1 (i)

Pythion who lived near the temple of Earth suffered from twitching which began in the hands.

First day: high fever, delirium.

Second day: all symptoms more pronounced.

Third day: condition unchanged.

Fourth day: passed small, undigested, bilious stools.

Fifth day: all symptoms more pronounced, periods of light sleep, bowels constipated.

Sixth day: sputum not homogeneous and tinged red.

Seventh day: mouth distorted.

Eighth day: all symptoms more pronounced, fits of twitching continued. From the beginning of the illness until the eighth day, the urine was thin and pale, with cloudy matter in it.

Tenth day: sweated, sputum rather ripe, the crisis reached; urine rather thin about the time of the crisis. After the crisis, in fact forty days later, a peri-anal abscess formed which produced the symptom of strangury.

(ii)

Hermocrates, who lay near the new wall, took a fever. It started with a headache and pain in the loins. The hypochondrium was flabby and distended and the tongue was parched. He immediately became deaf, was unable to sleep, was thirsty but not excessively so, while the urine was thick and red and formed no sediment. There was some inflammatory matter in the stools.

Fifth day: passed thin urine which had particles suspended in it but which did not form a sediment; became delirious towards nightfall.

Sixth day: signs of jaundice; all symptoms more pronounced, not mentally lucid.

Seventh day: condition uneasy, urine thin as before. Condition remained more or less unchanged on the following days. About the eleventh day there was the appearance of general improvement but then coma supervened; he passed thicker reddish urine which was clear below. Slowly became lucid.

Fourteenth day: no fever, no sweating, slept, fully lucid. Urine much as before. A relapse with fever around about the seventeenth day. This was followed by high fever on succeeding days; delirium, thin urine. A second crisis occurred on the twentieth day; lost his fever, no sweating. The whole time he suffered from loss of appetite. He was fully lucid, but was unable to converse. Tongue dry but no thirst. Slept a little, then comatose. About the twenty-fourth day there was a further rise of temperature with diarrhoea. On the following days high fever continued and his tongue was parched.

Twenty-seventh day: died.

The patient's deafness lasted throughout his illness; the urine was thick and red forming no sediment, or else thin and colourless with suspended particles in it. The patient also lost his sense of taste.

(iii)

A man who dwelt in the park of Delearces suffered for a long time from heaviness of the head and right temporal pain. For some reason he took a fever and went to bed.

Second day: a small flow of pure blood from the left nostril. Bowels well opened; urine thin and not homogeneous, containing small suspended particles like barley-meal or semen.

Third day: a high fever; stools dark, thin and frothy with a livid sediment. Patient became stuporous; going to stool caused discomfort. Urine had a livid, somewhat sticky sediment.

Fourth day: vomited small quantities of yellow bilious matter and, after a while, a small quantity of rust-coloured material. There was a small haemorrhage of pure blood from the left side of the nose, stools and urine as before; sweating about the head and shoulders; spleen enlarged; pain in the

region of the thigh; a rather flabby distension of the right hypochondrium; did not sleep at night; slight delirium.

Fifth day: stools larger, dark and frothy with a dark sediment; no sleep that night, delirium.

Sixth day: stools dark, oily, sticky and foul-smelling. Slept and was rather more lucid.

Seventh day: tongue dry, thirsty, did not sleep, delirious; urine thin, but not of a good colour.

Eighth day: stools small and dark, formed; slept and became lucid; thirsty, but not excessively so.

Ninth day: rigors supervened, a high fever, sweating, chilling, delirium, squint in the right eye; tongue dry, thirst, insomnia.

Tenth day: condition unchanged.

Eleventh day: became fully lucid, no fever, slept; urine was thin about the time of the crisis. He remained without fever for a period of two days but a relapse occurred on the fourteenth day, when he immediately became completely delirious and was sleepless all night.

Fifteenth day: urine muddy, resembling the appearance of urine which contains sediment after it is stirred up; a high fever, completely delirious, pain in the knees and calves. Passed dark stools after the application of a suppository.

Sixteenth day: urine thin with cloudy matter suspended in it; delirium.

Seventeenth day: in the morning the extremities were cold; he was wrapped up, had high fever, sweating all over; condition improved, became more lucid but not without fever; thirsty, vomited small quantities of yellow bilious matter; passed stools which after a little became dark, small in quantity and thin. Urine was thin but not of good colour.

Eighteenth day: was not lucid; comatose.

Nineteenth day: condition unchanged.

Twentieth day: slept, was fully lucid, sweating, no fever; not thirsty, urine thin.

Twenty-first day: slight delirium, somewhat thirsty, pain in the hypochondrium associated with palpitation in the umbilical region.

Twenty-fourth day: sediment in the urine; was fully lucid.

Twenty-seventh day: pain in the right hip, but in other respects doing very well; sediment in the urine. About the twenty-ninth day, pain in the right eye; urine thin. On the fortieth day, passed frequent white stools containing phlegmatic matter; sweated much all over and reached the final crisis.

(iv)

At Thasos, Philistes had a headache for a long time and, on falling into a state of stupor one day, took to his bed. As a result of drinking, continuous fever occurred and the pain became worse. It was at night that he first became hot.

First day: vomited small quantities of yellow bilious matter at first, afterwards more which was rust-coloured. Bowels were opened. An uneasy night.

Second day: deafness, high fever; the right hypochondrium was contracted and indrawn; urine thin, transparent and having a small amount of suspended particles in it resembling semen. He became mad about midday.

Third day: uneasy.

Fourth day: convulsions, a fit.

Fifth day: died in the morning.

(v)

Chaerion who lay at the house of Delias took a fever as the result of drinking. At once his head began to feel heavy and to ache; he had no sleep, bowels disordered with thin, rather bilious stools.

Third day: high fever, twitching of the head, particularly of the lower lip. After a while, rigor, convulsions, complete delirium; passed an uneasy night.

Fourth day: quiet, slept a little, delirious.

Fifth day: condition bad, all symptoms more pronounced, random babbling, an uneasy sleepless night.

Sixth day: condition unchanged.

Seventh day: rigors, high fever, sweating all over; the crisis reached. Throughout his stools were bilious, small in quantity and undigested. Urine thin, of poor colour and with a cloudy substance suspended in it. About the eighth day he passed urine of a better colour which had a small amount of white sediment; he became lucid and lost his fever and there was an intermission. On the ninth day a relapse occurred.

Fourteenth day: high fever.

Sixteenth day: vomited bilious yellow matter rather frequently.

Seventeenth day: rigors, high fever, sweating; reached a crisis and the fever left him. After the relapse and then the crisis, the urine was of good colour with a sediment. Delirium was absent during the relapse.

Eighteenth day: slight rise in temperature, slight thirst, urine thin with a cloudy substance suspended in it; slight delirium.

Nineteenth day: no fever, pain in the neck, sediment in the urine. The final crisis was reached on the twentieth day.

(vi)

The unmarried daughter of Euryanax took a fever. She suffered from no thirst throughout and did not take her food. Passed small stools; the urine thin, of small quantity and not of good colour. At the beginning of the fever she had pain around the anus. On the sixth day she did not sweat, as she was without fever, and reached a crisis. However, there was some slight suppuration about the anus, the abscess bursting about the time of the crisis. On the seventh day after the crisis, rigors occurred and there was slight fever with sweating. Subsequently she was always cold about the extremities. About the tenth day after the sweating occurred, she became delirious, but quickly recovered her lucidity again. They said it was through eating grapes. After an intermission of twelve days, she again became quite delirious, the bowels were disordered, the stools being bilious, unmixed, small in quantity, thin and pungent. The stools were passed frequently. She

died on the seventh day following the last attack of her illness and a rash was present throughout, while the uvula was retracted. Fluxes were present, small and acrid. Although she had a cough it was unproductive. She had no appetite the whole time, nor did she wish for anything. She had no thirst and drank nothing worth mentioning. She was silent and would not talk. She was depressed and despaired of herself. There was also some sign of an inherited tendency to consumption.

(vii)

The woman who suffered from sore throat, who lived near Aristion's place, started first with her voice becoming indistinct. Her tongue was red and parched.

First day: shivering; high fever.

Third day: rigor, high fever; a hard reddish swelling on either side of the neck down to the chest, extremities cold and livid, respiration superficial. What she drank was regurgitated through the nostrils and she was unable to swallow. Stools and urine suppressed.

Fourth day: all symptoms more pronounced.

Fifth day: died.

(viii)

The lad who lay by the Liars' Market took a fever as the result of exhaustion, having exerted himself by running more than he was accustomed.

First day: bowels disordered with copious thin bilious stools; urine thin, rather dark; insomnia, thirst.

Second day: all symptoms more pronounced; stools more copious and unhealthy. No sleep; his mind was disordered; slight sweating.

Third day: uneasy, thirst, nausea, much tossing about, distress, delirium, extremities cold and livid; a somewhat flabby bilateral distension of the hypochondrium.

Fourth day: no sleep; condition deteriorated.

Seventh day: died.

Age about twenty.

(ix)

The woman at the house of Tisamenus was taken to her bed feeling very ill with symptoms suggesting an attack of ileus. Much vomiting; she could keep neither food nor drink down. Pain in the hypochondrium; also pain lower down in the belly proper. Constant colic. No thirst. Became warm, but the extremities remained cold throughout; nausea; insomnia. Urine small in quantity and thin. Stools raw, thin and small. It was impossible to do anything to help her; she died.

(x)

A woman of the household of Pantimides took a fever the first day after a miscarriage. Tongue was parched; thirst, nausea and insomnia, bowels disordered, the stools being thin, copious and raw.

Second day: rigors, high fever, much purgation; did not sleep.

Third day: pains more intense.

Fourth day: became delirious.

Seventh day: died.

The bowels were relaxed throughout, the stools being watery, thin, raw and voluminous; urine little and thin.

(xi)

Another case of miscarriage about the fifth month resulted in Hicetas' wife taking a fever. To begin with she was comatose but later became wakeful and suffered from pain in the loins and heaviness of the head.

Second day: bowels disordered with small, thin stools, at first unmixed.

Third day: worse; did not sleep at night.

Fourth day: became delirious and suffered from fears and from depression. Squint in the right eye; a small amount of cold sweating about the head. Extremities cold.

Fifth day: all symptoms more pronounced; much delirious

talking, but she soon became lucid again. No thirst, insomnia; the stools were large in quantity, and unfavourable throughout; urine little in quantity, thin and rather dark. Extremities cold and somewhat livid.

Sixth day: no change.

Seventh day: death.

(xii)

A woman who lay near the Liars' Market, having given birth to a first-born male child after a difficult labour, took a fever. To start with she suffered from thirst, nausea and a slight ache in the heart; her tongue was parched and the bowels were disordered, her stools being thin and small. She did not sleep.

Second day: slight rigors, a high fever, a small amount of cold sweating about the head.

Third day: distressed; passed a large quantity of raw thin stools.

Fourth day: rigors, all symptoms more pronounced. Insomnia.

Fifth day: distressed.

Sixth day: no change; passed a large quantity of liquid stools.

Seventh day: rigors, high fever, thirst, much tossing about. Towards evening, cold sweating all over and became chilled; the extremities were cold and did not get warm again. Further rigors during the night; extremities still would not get warm; no sleep and some delirium which quickly passed off.

Eighth day: about noon, she became warm, thirsty and comatose; nausea, vomited a small quantity of yellowish bile-stained material. An uneasy night without sleep. Frequently unconsciously incontinent of large quantities of urine.

Ninth day: all symptoms abated; comatose. In the afternoon had rigors, vomited a small amount of bilious material.

Tenth day: rigor, fever increased in a paroxysm; had no sleep at all. Early in the morning she passed a large quantity of urine which did not show a sediment. Extremities became warm.

Eleventh day: vomited bilious rust-coloured material. Shortly afterwards, she had rigors and the extremities became cold again. Towards evening, sweating, rigors and much vomiting; a distressed night.

Twelfth day: vomited much dark, foul-smelling matter; much sobbing, a distressing thirst.

Thirteenth day: vomited much dark foul-smelling matter; rigor. About midday she lost her voice.

Fourteenth day: epistaxis. Death.

This patient throughout had relaxed bowels and shivery attacks; age about seventeen.

2. The year was rainy and southerly; throughout there was no wind. Droughts having occurred immediately before, about the rising of Arcturus, there was much rain accompanied by southerly winds. The autumn was overcast and cloudy with a very heavy rainfall. The winter was southerly and wet; mild after the solstice. Much later, near the equinox, belated storms occurred and, right at the equinox, a spell of northerly winds bringing snow but this did not last long. The spring again was southerly and calm; rainfall continued to be heavy until the rising of the Dog Star. The summer was fine and warm, and there were periods of stifling heat. The etesian winds blew feebly and at scattered intervals. Again about the rising of Arcturus, northerly winds brought much rain.

The whole year then being southerly, wet and mild, health was good during the winter, except in the case of the consumptive, about whom I shall write.

3. Early in the spring, just at the time the cold snaps occurred, there was a lot of severe erysipelas; in some cases from some obvious cause, but in others from none. Many cases proved fatal and many had a painful throat. The symptoms were a weakened voice, *causus* accompanied by brain fever, aphthae in the mouth, tumours in the pudendal region, ophthalmia, carbuncles, disorders of the bowels, loss of appetite, sometimes thirst, abnormalities of the urine which was abundant and bad. The patients were mainly comatose, but again there were periods of wakefulness. Very often there was

no crisis or it was attained with difficulty. There was also dropsy and much consumption. Such were the epidemic diseases; the sick fell into the classes given above, and many of them died. The course of the various diseases was as follows.

4. In many cases erysipelas occurred which spread all over the body on any chance happening and especially following a slight wound; those about sixty years of age were particularly liable to it in the head if any wound there were slightly neglected. Many cases, too, under treatment suffered from extensive inflammation, the erysipelas spreading rapidly in all directions. In the majority of cases abscessions turned to collections of pus. There was much destruction of flesh, sinews and bones. The fluid which formed in the abscess was not like [ordinary] pus but a different sort of morbid fluid, being both copious and varied. In those cases where something of this sort affected the head, the whole head would become bald including the beard; the bones became thin and portions became detached, while there was a discharge at many points.

These symptoms occurred both with and without fever. They were more frightening than serious, for when the disease resulted in the formation of a localized collection of pus, or some similar ripe condition, the majority recovered. On the other hand, when the inflammation and the erysipelas departed without causing such abscess formation, many sufferers died. Much the same happened if it wandered off to any other part of the body, for many had the whole arm or forearm waste away. Those whose sides were attacked, suffered harm in some part either in front or at the back of the body. In some cases, the whole thigh or the calf became thin and the whole foot too. The worst of all was if the disease attacked the pubes and private parts.

All these things happened as the result of a wound or of some obvious cause. But in many other cases it accompanied, preceded or followed fevers. In these cases, whenever localization took place with the formation of a collection of pus, or an opportune disturbance of the bowels, or favourable urine was

passed, this resolved the disease. But when none of these symptoms occurred and the disease departed without giving a sign, it was fatal. By far the largest number of cases of erysipelas occurred in the spring; but it continued throughout the summer and on into the autumn.

5. Some people were very ill with swellings in the throat, inflammation of the tongue and abscesses in connection with the teeth.

A common sign at the onset, not only of consumption, but also in cases of *causus* and brain-fever, was a weakening and choking of the voice.

6. Cases of *causus* and brain-fever began early in the spring after the cold spells had passed, and many people were taken ill at that time. In these cases, the disease was acute and liable to prove fatal. The symptoms found in *causus* were as follows. To start with, the patients were comatose and nauseated, shivering and with high fever, but they were neither excessively thirsty nor delirious. Slight epistaxis occurred. In the majority of cases, the paroxysms took place on even days, and about the time of these paroxysms, there was loss of memory, exhaustion and loss of voice. The feet and hands were rather cold all the time but especially so at the paroxysms. Subsequently, the patients would get warm again slowly, but not thoroughly; they also became lucid and talked. They were also afflicted with a continuous coma but something that differed from sleep, or with a painful insomnia.

In most of these cases, the bowels were disordered, the stools being thin, raw and copious. The urine was copious too and thin, but giving none of the signs of crisis, nor any other helpful sign. In fact, those who were then attacked showed no crisis at all; there was no beneficent haemorrhage nor did critical abscess-formation of the usual sort occur. Many died after no fixed interval, but just as matters chanced; some at the crisis, some after a long period of loss of voice, some in bouts of sweating. These were the symptoms in the fatal cases, but they were much the same in brain-fever. All these cases showed a complete absence of the symptoms of

thirst; nor did any of those with brain-fever go mad as in other cases, but they perished with their heads weighed down by a growing stupor.

7. There were also other fevers which I shall describe. Many had aphthae and ulcers in the mouth; many had discharges around the pudendal area; while sores and tumours both external and internal occurred, some about the groin. Moist ophthalmia occurred which was both chronic and painful. Excrescence on the eyelids, both internal and external, occurred and, in many cases, impaired the vision: the name 'figs' is given to these. There were many cases of growth on other ulcers and on the pudenda. Carbuncles were common during the summer and other septic lesions and large pustules. Many suffered from extensive herpetic lesions.

8. Frequent and dangerous disorders affecting the belly were common. First, many had distressing tenesmus; most of these were children, including all below the age of puberty, and most of these died. Many had enteritis or dysentery, but in these cases without overmuch distress. In some cases the stools were bilious, fatty, thin and watery. In many cases this was so at the inception of the disease, both with and without fever. Painful colic and malignant flatulent colic also occurred; in these going to stool did not relieve the pains, the stools being such that much remained within the bowel after attempted evacuation. This condition responded only with difficulty to medicines, and in most cases purgatives did additional harm. Many of those with this complaint perished soon; others lasted rather longer.

To sum up, whether their illnesses were long or short, all who suffered from disease of the belly were specially likely to die, for disease of the belly was a contributory factor in all the fatal cases.

9. In addition to all the previously mentioned symptoms, all suffered from loss of appetite, and that to an extent which I have never previously encountered. Those just described were especially affected, and particularly the hopeless cases both in this group and in the others mentioned. Some had a thirst, but not all. Those who had fevers or one of the other diseases

had an intemperate thirst in no case, but they would take as much or as little to drink as you wished.

10. The amount of urine passed was great; it was not proportional to the amount drunk but considerably in excess. The urine which was passed was also markedly bad, for it possessed neither thickness nor ripeness. In most cases these signs signified some wasting and disorder of the bowels with pain and no crisis.

11. Those who suffered from brain-fever and *causus* were particularly liable to become comatose, but this also occurred as an additional symptom in the other diseases in all the most serious cases, provided they were accompanied by fever. Throughout, most patients suffered either from deep coma or had only short periods of light sleep.

12. Many other types of fever were epidemic: tertians, quartans, nocturnal fevers, continued fevers, long fevers, irregular fevers, fever accompanied by nausea, and unstable fevers. All these were accompanied by much disturbance; the bowels were disordered and the patients were liable to shivering attacks. Sweating took place but did not mark the crisis; the condition of the urine has been described. In most of these cases, the illness was prolonged, for even when abscess formation did occur, it did not bring about a crisis in the way usual with other cases. In general, the diseases reached a crisis with difficulty, or there was no crisis and the illness remained chronic; this was specially the case with these people. A few of them had a crisis about the eightieth day, but in most the disease departed at no fixed time. A few died of dropsy without having been confined to their beds. Many were troubled with swellings in addition to their other diseases; especially the consumptive.

13. But it was consumption which proved the most widespread and the most serious complaint and this was responsible for most of the deaths. In many cases it began during the winter and, though many took to their beds, some of those who were ill did not do so. By early spring, most of those who had taken to their beds had died. In other cases, the cough, although it did not go away altogether, was less

troublesome during the summer. Towards autumn, all took to their beds and many died. Of these, the majority had had a long illness.

In most cases, the illness started with sudden deterioration. The symptoms were: frequent shivering attacks, often high continued fever, much untimely sweating although the patients remained cold throughout, and much chilling so that it was difficult to get them warm again. Their bowels were inconstant, constipation rapidly giving way to diarrhoea, while near the end, diarrhoea was violent in all cases. The lungs were evacuated downwards; although the urine was large in quantity it was unfavourable. Wasting was pernicious. Coughing continued throughout the illness, and it was common for patients to bring up large amounts of ripe moist sputum, without excessive pain. But even in the cases where there was pain, the process of ridding the lungs of matter took place quite mildly. The pharynx was not painful, nor did salty humours cause any trouble. There were however copious discharges from the head of sticky, white, moist and frothy material. These patients, like those already described above, suffered by far the greatest harm from their loss of appetite. They would not even take fluid nourishment, but remained without thirst. As death approached, they showed heaviness of the body, coma, swelling becoming dropsical, shivering and delirium.

14. The appearance which characterizes consumptives is a smoothness of the skin, slight pallor, freckles, a slight flush, sparkling eyes, white phlegm and winging of the shoulder-blades. The signs were the same in women too. They also show melancholy and suffused cheeks.

Causus, brain-fever and dysentery might follow upon these symptoms. The young, who were liable to phlegm, suffered from tenesmus. Those subject to bitter bile had long-lasting diarrhoea and acrid, greasy stools.

15. In all the cases so far described, the spring was the worst time and most of the deaths occurred then; the summer was the easiest time and few died then. Deaths occurred again during the autumn and under the Pleiads, in most cases on the

fourth day. It seems to me that a normal summer is beneficial. For the coming of winter terminates summer diseases, and the coming of summer shifts winter diseases. All the same, considered by itself, the summer in question was not a settled one; for it suddenly turned hot, southerly and windless, but this was beneficial by being such a change from the previous weather.

SIXTEEN CASES

17* (i)

At Thasos, the man from Paros who lay beyond the temple of Artemis took a high fever, at first of the continued type like that of *causus*, with thirst. At first he was comatose, then wakeful again; the bowels were disordered at first and the urine thin.

Sixth day: passed oily urine; delirious.

Seventh day: all symptoms more pronounced; did not sleep at all, urine unchanged, mind disordered. The stools were bilious and greasy.

Eighth day: slight epistaxis; vomited a small quantity of rust-coloured matter. Small amount of sleep.

Ninth day: no change.

Tenth day: all symptoms showed a decrease in severity.

Eleventh day: sweated all over and became chilled, but quickly got warm again.

Fourteenth day: high fever, stools bilious, thin and copious; urine contained suspended matter. Delirium.

Seventeenth day: distressed, for the patient was sleepless and the fever increased.

Twentieth day: sweating all over, no fever, stools bilious, no appetite, comatose.

Twenty-fourth day: a relapse.

Thirty-fourth day: no fever; bowels not constipated. Temperature rose again.

* Section 16 appears to be an interpolation and is omitted.

Fortieth day: no fever, bowels constipated for a short while, no appetite, slight fever returned and was, throughout, irregular; at times he was without fever at others not. Any remission and improvement was followed quickly by a relapse. He took but little food and that poor stuff. He slept badly and showed delirium about the time of the relapses. At these times he passed thicker urine, but it was disturbed and bad. The bowels were sometimes constipated, sometimes relaxed. Slight fever continued throughout, and the stools were thin and copious.

Died in 120 days.

In this case, the bowels from the first day were either loose with copious bilious stools, or he passed frothy undigested constipated stools. The urine was bad throughout. He was comatose for the most part, but he could not sleep when in pain. At no time did he have any appetite.

(ii)

At Thasos, a woman who lay near the cold spring gave birth to a daughter. The lochia were withheld and on the third day she had a high fever with shivering. For a long while before delivery she had been febrile, had kept to her bed and suffered from loss of appetite. After the preliminary rigor, fever was high and continued and accompanied by shivering. On the eighth day and subsequent days there was much delirium, but she quickly became lucid again. The bowels were disordered and she passed thin copious stools like watery bile. No thirst.

Eleventh day: was both lucid and comatose. Passed much thin dark urine. Sleepless.

Twentieth day: slight chilling but quickly became warm again; slight delirious talking, insomnia. No change in the condition of the bowels; much watery urine.

Twenty-seventh day: no fever, bowels constipated. Not long afterwards she had a violent pain in the right hip which lasted a long time. Fevers followed again; urine watery.

Fortieth day: pain in the hip lessened, but she had continued moist cough. Bowels constipated, no appetite, no change in

the urine. The fever showed no remission generally, but exacerbation occurred in no regular pattern.

Sixtieth day: the cough ceased without any signs, for there was no ripening of the sputum nor any of the other signs of localization. The mandible was in spasm and protruded to the right and the patient comatose; then followed delirious talking quickly giving way to lucidity. She was obstinately averse to food. The jaw became normal again, but she continued to pass small quantities of bilious matter in the stools. The fever was higher and was accompanied by shivering. The voice was lost in subsequent days but was regained.

Died on the eightieth day.

In this case the urine was dark, thin and watery throughout. Coma set in and there was loss of appetite, despondency, insomnia, fits of anger and agitation associated with a melancholy disposition.

(iii)

At Thasos, Pythion, who lay beyond the temple of Heracles, had a violent rigor and high fever as the result of strain, exhaustion and insufficient attention to his diet. Tongue parched, he was thirsty and bilious and did not sleep. Urine rather dark containing suspended matter which did not settle.

Second day: about midday, chilling of the extremities, particularly about the hands and head, showed loss of both speech and voice, and he was also short of breath for a long time. Then he became warm again and thirsty. A quiet night; slight sweating about the head.

Third day: quiet. Late in the day, about sunset, slight chilling, nausea, disturbed bowels followed by an uneasy sleepless night. Passed a small constipated stool.

Fourth day: morning quiet. About midday, all symptoms more pronounced; chilled, aphasia, aphonia became worse. After a while he became warm again and passed dark urine containing suspended matter. A quiet night; slept.

Fifth day: seemed to improve, but there was a painful heaviness in the belly. Thirsty. An uneasy night.

Sixth day: morning quiet. In the evening the pains were more severe and paroxysmal. The bowels were well opened late at night after an enema. Slept during the night.

Seventh day: nausea, somewhat distressed. Passed oily urine. Much disturbed during the night, random talking, no sleep.

Eighth day: slept a little in the morning, but soon became chilly with loss of voice. Respiration was superficial and shallow, late at night he became warm again, but delirious. A slight improvement took place towards daybreak. Stools unmixed, small and bilious.

Ninth day: comatose; nauseated whenever he woke. No excessive thirst. About sunset he became distressed, talked at random and this was followed by a bad night.

Tenth day: in the morning, he lost his voice, became very chilled, had high fever with much sweating and died.

In this case the distress was marked on the even days.

(iv)

A patient with brain-fever took to his bed on the first day of the illness and vomited much rust-coloured thin matter. He had severe fever accompanied by shivering and continuous sweating of the whole body. There was a painful heaviness of the head and neck. The urine was thin and contained a small amount of scattered particles suspended in it, but did not sediment. He passed a large single stool, became delirious and did not sleep.

Second day: he was voiceless in the morning; fever high, sweating without remission. The whole body throbbed and convulsions occurred during the night.

Third day: all symptoms more pronounced.

Fourth day: died.

(v)

At Larisa, a bald man suddenly had a pain in the right thigh. No treatment which he received did him any good.

First day: high fever of *causus* type, did not tremble, but the pain continued.

Second day: pains in the thigh were relieved, but the fever increased. The patient became somewhat distressed and did not sleep; the extremities were cold. He passed a lot of urine but this was not of a favourable kind.

Third day: the pain in the thigh ceased. His mind became unhinged and there was much disturbance and tossing about.

Fourth day: died about noon.

(vi)

At Abdera, Pericles took a high fever of continued type, accompanied by distress. He had much thirst, was nauseated and could not keep liquids down. The spleen was enlarged and he had headache.

First day: epistaxis from the left nostril; the fever however increased considerably. He passed much cloudy white urine which did not sediment on standing.

Second day: all symptoms more pronounced. The urine however was thick and settled more. The nausea was less severe and the patient slept.

Third day: the fever became less and he passed a large quantity of ripe urine with a lot of sediment. A quiet night.

Fourth day: about noon he had a warm sweat involving the whole body, the fever left him and he reached the crisis. There was no relapse.

(vii)

A girl who lay at a house on the Sacred Way at Abdera took a fever of the *causus* type. She complained of thirst and was wakeful. Menstruation took place for the first time.

Sixth day: much nausea, redness and shivering; she was distraught.

Seventh day: no change. The urine, though thin, was of good colour and there was no trouble with the bowels.

Eighth day: deafness supervened, with high fever, insomnia, nausea and shivering. She became lucid. Urine the same.

Ninth day: no change, nor on the following days. The deafness persisted.

Fourteenth day: mind disordered; the fever became less.

Seventeenth day: a large epistaxis; the deafness became slightly less. Nausea and deafness were present on the following days as well as some delirium.

Twentieth day: pain in the feet and deafness. The delirium ceased and there was a slight nose-bleed and sweating; no fever.

Twenty-fourth day: the fever returned and she was deaf again. The pain in the feet continued and her mind was wandering.

Twenty-seventh day: severe sweating and lost her fever. The deafness cleared up and, although pain in the feet remained, in other respects the final crisis was reached.

(viii)

Anaxion, who lay near the Thracian Gates at Abdera, took a high fever. There was continuous aching in the right side and a dry cough, but no spitting in the first few days. He suffered from thirst and insomnia, but the urine was copious, thin and of good colour.

Sixth day: delirium. No improvement as the result of warm fomentations.

Seventh day: distressed as the fever increased. The pain did not decrease, cough was troublesome and breathing difficult.

Eighth day: I bled him at the elbow; there was a large flow of blood as there should be. The pain decreased but the dry cough continued.

Eleventh day: the fever decreased. There was slight sweating about the head, while the cough and the sputum from the lungs were moister.

Seventeenth day: began to expectorate a small quantity of ripe sputum and his condition improved.

Twentieth day: sweated and lost his fever. After the crisis he was thirsty and the matter evacuated from the lungs was not good.

Twenty-seventh day: the fever returned and, with coughing, he brought up much ripe matter. A large white sediment in the urine. His thirst was lost and his respiration became normal.

Thirty-fourth day: sweated all over; no fever. A complete crisis.

(ix)

Heropythus at Abdera had a headache; he remained up for a while but eventually went to bed with it. He lived near the upper highroad. He showed a fever of the *causus* type. At first he vomited much bilious matter and suffered from thirst and much distress. His urine was thin and dark; sometimes, but not always, it contained suspended matter. An uneasy night. The fever showed paroxysms at varying intervals, for the most part quite irregular.

About the fourteenth day, he complained of deafness and the fever increased; the urine remained as before.

Twentieth and following days: much delirium.

Fortieth day: a large epistaxis and became more lucid. The deafness was still present but was less severe. The fever abated. Small epistaxes occurred frequently on the following days.

About the sixtieth day the haemorrhages stopped but there was a violent ache in the right hip and the fever increased again. A little later, there was pain involving all the lower part of the body. It so happened that either the temperature was up and the deafness worse, or these two symptoms abated while the pain in the lower part of the body and about the hips became worse.

From the eightieth day onwards all the symptoms decreased, although none entirely disappeared. He passed urine of good colour with more sediment.

About the hundredth day, there was disorder of the bowels with the passage of copious bilious stools. This went on to a considerable extent for not a little while. The signs of dysentery, accompanied by pain, were associated with an easing off of the other symptoms. Generally speaking, the fever departed and the deafness ceased.

A final crisis took place on the 120th day.

(x)

Nicodemus took a fever at Abdera as the result of sexual indulgence and drinking. To start with he suffered from nausea and pain in the heart, thirst and a parched tongue. His urine was thin and dark.

Second day: paroxysms of fever, shivering, nausea; no sleep. Vomited yellow bilious matter. Urine as before. A quiet night and he slept.

Third day: a general remission and improvement. About sunset he became somewhat distressed again and passed an uneasy night.

Fourth day: a rigor, much fever and pains all over. Urine thin containing suspended matter. Night again quiet.

Fifth day: all symptoms continued but were less pronounced.

Sixth day: pain all over as before; the urine contained suspended matter. Delirium.

Seventh day: improved.

Eighth day: all other symptoms abated.

Tenth and following days: the pains continued but were all less acute. The paroxysms and pain in this case were throughout more pronounced on the even days of the illness.

Twentieth day: passed white urine which, although thick, did not form a sediment on standing. Much sweating; appeared to lose his fever but again became warm in the evening with pains as before, shivering, thirst and slight delirium.

Twenty-fourth day: passed much white urine which contained a large quantity of sediment. Sweated all over profusely, the sweat being warm. Lost his fever as the crisis was passed.

(xi)

A woman at Thasos became morose as the result of a justifiable grief, and although she did not take to her bed, she suffered from insomnia, lose of appetite, thirst and nausea. She lived on the level ground near Pylades' place.

Early on the night of the first day, she complained of fears

and talked much; she showed despondency and a very slight fever. In the morning she had many convulsions; when the convulsions had for the most part ceased, she talked at random and used foul language. Many intense and continuous pains.

Second day: condition unchanged; no sleep and the fever higher.

Third day: the convulsions ceased but lethargy and coma supervened followed by a return to consciousness, when she leapt up and could not be restrained. There was much random talking and high fever. That night she sweated profusely all over with warm sweat. She lost her fever and slept, becoming quite lucid and reaching the crisis.

About the third day, the urine was dark and thin, and contained suspended matter, for the most part round particles, which did not sediment. About the time of the crisis, a copious menstrual discharge took place.

(xii)

A girl at Larisa took a high fever of the *causus* type. She had insomnia and thirst while her tongue was dry and smoke-coloured. The urine was of good colour but thin.

Second day: distressed; did not sleep.

Third day: the stools were bulky, watery and greenish. On the following days stools of similar character were passed without distress.

Fourth day: passed a small quantity of thin urine which contained suspended matter which did not settle. Delirium during the night.

Sixth day: a violent and copious epistaxis. Shivering was followed by profuse hot sweating all over; she lost her fever and reached the crisis.

She menstruated for the first time during this illness, while the fever was still present, but after the crisis. She was only a girl. Throughout, she suffered from nausea, shivering, a flushed face, aching eyes and heaviness of the head. In this case there was no relapse but a single crisis. The distress was experienced on the even days.

(xiii)

Apollonius at Abdera suffered for a long time without taking to his bed. He had an enlarged abdomen and a pain in the region of the liver to which he had become accustomed, for he became jaundiced, flatulent and of pallid complexion.

As a result of eating beef and drinking cows' milk intemperately, he developed what was a slight fever at first and went to bed. He got much worse through taking a large amount of milk, both boiled and cold, both goats' and sheep's, and by taking a generally bad diet. For the fever increased and he passed nothing worth mentioning in the stools of the food he took. He passed little urine and that was thin. He was unable to sleep.

He then became badly distended, suffered from thirst and became comatose. There was swelling, accompanied by an aching pain in the right hypochondrium. All the extremities were somewhat cold. He began talking at random, showed loss of memory in anything he said, and became disorientated.

About the fourteenth day from the time he took to his bed he had rigors, his temperature rose and he went out of his mind; there was shouting, disturbance and much talking, then he settled down again and relapsed into coma. Subsequently his bowels were upset, the stools being copious, bilious, raw and unmixed. The urine was dark, small in quantity and thin. There was much distress. The excreta were not always the same; sometimes they were small in quantity and dark and rust-coloured, or they were greasy, raw and pungent. At times too he seemed to pass milky substances.

About the twenty-fourth day he was more comfortable; in other respects the symptoms were unchanged, but he became slightly lucid. He could remember nothing from the time he took to his bed. Shortly afterwards, his mind was again disordered and there was a general tendency to deteriorate.

About the thirtieth day he had high fever, copious thin stools and delirium. Extremities cold; loss of voice.

Thirty-fourth day: died.

Throughout this case, from the time I knew of it, the bowels

were disordered and the urine was thin and dark; the patient also suffered from coma, insomnia and cold extremities, and he was delirious throughout.

(xiv)

At Cyzicus, a woman gave birth to twin girls; the labour was difficult and the lochia abnormal.

On the first day, there was high fever with shivering, and heaviness and aching of the head and neck. She was sleepless from the start and she was silent, scowling and disobedient. Urine thin and of bad colour, thirst, nausea for the most part, diarrhoea and constipation succeeding each other at no fixed intervals.

Sixth day: much random talking during the night; no sleep.

About the eleventh day went mad and then became lucid again; urine dark, thin and then, after an interval, oily. The bowels were disturbed, the stools being large in quantity and thin in consistency.

Fourteenth day: many convulsions, extremities cold, still no trace of lucidity, suppression of urine.

Sixteenth day: loss of voice.

Seventeenth day: died.

(xv)

At Thasos the wife of Delearces, who lay on the level ground, took a high fever with shivering as the result of grief. From the start she used to wrap herself up, always remaining silent while she groped about, scratching and plucking out hair, and alternately wept and laughed. She did not sleep. She remained constipated even when the bowels were stimulated. She drank a little when reminded to do so; the urine was thin and small in quantity. Fever was slight to the touch; the extremities were chilly.

Ninth day: much random talking, but subsequently she quietened down and fell silent.

Fourteenth day: respiration infrequent; deep for a while and then the breaths would be short.

Seventeenth day: the bowels were stimulated and disordered stools were passed giving way to the actual liquid drunk, nothing being retained. She was insensible to everything. Skin taut and dry.

Twentieth day: much talking and then quietened down again; loss of voice, respiration in short breaths.

Twenty-first day: died.

Throughout this case respiration was intermittent, and deep. She was insensible to everything, always kept herself wrapped up and either talked at random or kept silence.

(xvi)

At Meliboea, a young man who had been running a temperature for a long time as the result of drinking and much sexual indulgence, took to his bed. His symptoms were shivering, nausea, insomnia and lack of thirst.

On the first day, his bowels passed a large quantity of solid faeces accompanied by much fluid. On the following days he passed a large quantity of watery, greenish stools. His urine was thin and small in quantity, and of bad colour. Respiration at long intervals and deep after a while. There was a somewhat flabby distension of the upper part of the abdomen extending laterally towards the flanks. Palpitation of the heart was continuous throughout. He passed oily urine.

Tenth day: was delirious without excitement, being well-behaved and silent. Skin dry and taut. Stools either copious and thin, or bilious and greasy.

Fourteenth day: all symptoms more pronounced. Delirium with much talking at random.

Twentieth day: went mad, much tossing about, passed no urine, kept down a small amount of fluid.

Twenty-fourth day: died.

THE SCIENCE OF MEDICINE

This spirited defence of Medicine is a remarkable document of an age when there were no precautions against unqualified practitioners, and all physicians were exposed to charges of charlatanry. The title is often rendered The Art, *but this gives the wrong impression, for it is the writer's main contention that Medicine is an exact science, not an undefinable art.*

1. There are men who have turned the abuse of the arts and sciences into an art in itself and, although they would not confess it themselves, their aim nevertheless is simply to display their own knowledge. But it seems to me that it is the aim and function of an intelligent mind to make new discoveries in whatever field such investigations may be useful, and also to bring to completion tasks that are but half-finished. On the other hand, a desire to use the art of abuse to belittle the scientific discoveries of others and to slander the discoveries of the learned to the illiterate, rather than to offer constructive criticism, is not so much the aim and function of an intelligent mind, as a proof of warped character and want of skill. Those who have the ambition to be scientists but not the necessary ability are equipped for the malicious habit of slandering their neighbours' work if it be right, or of censuring it if it be wrong. In other sciences, let those who can stop their enemies, each in his own subject. This thesis aims at answering the opponents of the science of medicine, deriving boldness from the character of those it censures, facility from the subject it defends and strength from its trained judgement.

2. It appears to me that there is no science which has no basis in fact. It would be absurd to suppose something that exists non-existent. For what being could anyone ascribe to a non-existent thing as a proof of its existence? If it were possible to see what has no substance, just as we see what does exist, then one could no longer call such a thing non-existent because it would then appear alike to the eye and the mind existent. But may not the truth be something like this: what

exists is always visible and recognizable, and what does not exist is neither visible nor recognizable? The activities of the sciences that are taught are things that can be seen and there is none that is not visible in one form or another. I at least am of the opinion that it is from the visible forms of things that they take their names. It is absurd to suppose that forms spring from names; that were impossible since names are adopted by convention, whereas forms are not invented but are characteristic of those things from which they spring.

3. If some of my readers have not sufficiently grasped the argument, it may be explained more clearly in other words. Let us consider the science of medicine, since that is my own subject, by way of illustration. First of all I would define medicine as the complete removal of the distress of the sick, the alleviation of the more violent diseases and the refusal to undertake to cure cases in which the disease has already won the mastery, knowing that everything is not possible to medicine. It is my intention to prove that medicine does accomplish these things and is ever capable of doing them. And as I describe the science I shall at the same time disprove the arguments of her traducers, whatever way each prides himself on his attack.

4. My first premise is one that everyone accepts; for it is admitted that some who have received medical attention have been restored to health. But the fact that everyone is not cured is reckoned an argument against the science, while those who recover from their diseases, so the traducers of the science assert, owe their cure to good fortune rather than to medical skill. Even I do not exclude the operations of fortune, but I think that those who receive bad attention usually have bad luck, and those who have good attention good luck. Secondly, what else but medical skill can be responsible for the cures of patients when they have received medical attention? Such, not content to wait on the shadowy form of Fortune, entrusted themselves to the science of medicine. While the share of chance is excluded, that of science is not. They submitted themselves to its ordinances and they had faith in it; they

considered its apparent nature and the result proved to them its effectiveness.

5. My opponents will say that many sick men have never seen a doctor and yet have recovered from their illnesses. I do not doubt it. But it seems to me that even those who do not employ a doctor may chance upon some remedy without knowing the right and wrong of it. Should they be successful, it is because they have employed the same remedy as a doctor would use. And this is a considerable demonstration of the reality and the greatness of the science, when it be realized that even those who do not believe in it are nevertheless saved by it. For when those who employ no doctors fall sick and then recover, they must know that their cure is due either to doing something or to not doing it. It may be fasting or eating a great deal, drinking largely or taking little fluid, bathing or not bathing, exercise or rest, sleep or wakefulness, or perhaps it is a mixture of several of these that is responsible for their cure. If they benefit, they cannot help but know what benefited them; if they are harmed, what harmed them; but everyone cannot tell what is going to bring benefit or harm beforehand. If a sick man comes to praise or to blame the remedies by which he is cured, he is employing the science of medicine. The failure of remedies too is no less a proof of the reality of the science. Remedies are beneficial only through correct applications, but they are harmful when applied wrongly. Where there are procedures which can be right or wrong, a consideration of these must constitute a science. I assert that there is no science where there is neither a right way nor a wrong way, but science consists in the discrimination between different procedures.

6. If the science of medicine and the profession were concerned in their cures only with the administration of drugs, purges and their opposites, my argument were a weak one. But the most renowned physicians are to be seen employing as therapeutic measures, diets and other ordinances which not even an untaught layman, much less a doctor, could deny were part of their science. There is nothing done which is useless by good doctors, nor is there anything useless in the science of

medicine. The majority of plants and preparations contain substances of a remedial or pharmaceutical nature and no one who is cured without the services of a doctor can ascribe his cure to chance. Indeed, upon examination, the reality of chance disappears. Every phenomenon will be found to have some cause, and if it has a cause, chance can be no more than an empty name. The science of medicine is seen to be real both in the causes of the various phenomena which occur and in the provisions which it takes to meet them, nor will it ever cease to be so.

7. This will suffice as a reply to those who, to the disparagement of medicine, attribute their health to luck. But those who use the example of patients who die from their illnesses as an argument against the efficacy of medicine make me wonder what trustworthy reason leads them to absolve a patient's weakness of character, and impute instead a lack of intelligence on the part of his physician. As if doctors can prescribe the wrong remedies but patients can never disobey their orders! It is far more likely that the sick are unable to carry out the instructions than that the doctors prescribe the wrong remedies. Physicians come to a case in full health of body and mind. They compare the present symptoms of the patient with similar cases they have seen in the past, so that they can say how cures were effected then. But consider the view of the patients. They do not know what they are suffering from, nor why they are suffering from it, nor what will succeed their present symptoms. Nor have they experience of the course of similar cases. Their present pains are increased by fears for the future. They are full of disease and starved of nourishment; they prefer an immediate alleviation of pain to a remedy that will return them to health. Although they have no wish to die, they have not the courage to be patient. Such is their condition when they receive the physician's orders. Which then is more likely? That they will carry out the doctor's orders or do something else? Is it not more likely that they will disobey their doctors rather than that the doctors, whose attitude I have outlined above, will prescribe the wrong remedies? There can be no doubt that the patients are likely to

be unable to obey and, by their disobedience, bring about their own deaths. So they are wrong who attribute the blame to the innocent and exculpate the guilty.

8. There are some too who condemn the science of medicine because doctors are unwilling to tackle incurable cases. They allege that such diseases as the physicians do attempt to treat would get better of themselves in any case, while those that need medical attention are neglected. If medicine were really a science, they say, all should be cured alike. In truth, this accusation would be a better one if they blamed the doctors for neglecting to treat such madmen as themselves. A man who thinks that a science can perform what is outside its province, or that nature can accomplish unnatural things, is guilty of ignorance more akin to madness than to lack of learning. Our practice is limited by the instruments made available by Nature or by Art. When a man is attacked by a disease more powerful than the instruments of medicine, it must not be expected that medicine should prove victorious. For example, fire is the most powerful caustic known to medicine, although there are many other caustics employed which are less powerful. Now it is not reasonable to call a disease incurable because it does not yield to the weaker remedies, but if it does not respond to the most powerful measures, it is clearly incurable. When fire fails to produce some particular effect, is it not plain that such an effect can only be accomplished by some science other than that whose instrument fire is? The same argument holds good for the failure of other methods employed in medical practice. For these reasons, then, I assert that when the physicians fail, it is the power of the disease which is responsible and not deficiencies in the science of medicine. These critics, then, would have us spend as much time on incurable patients as on those we can do something for. Thus do they impress doctors who are physicians in name alone while they are a laughing-stock to the genuine practitioners of the science. Experts in their professions require neither praise nor blame from such fools as they. Rather do they want criticism from men who have considered what are the full services medicine can

render, what deficiencies remain and, if there are deficiencies, how much must be attributed to the failure of the physicians and how much to the patient.

9. The defence of the other sciences must await another time and another book. Here I am concerned only with the science of medicine, to discuss its nature and how its practice should be judged. I have already demonstrated this in part; I now proceed to the rest. Those who are reasonably proficient in the science of medicine can distinguish two classes of disease. There is a small group in which the signs are readily seen by the eye, those in which the flesh is changed in appearance or in which swellings are demonstrable. Then there is a large group not so easily diagnosed. In the former group, signs can be elicited by sight and touch, for instance, whether the skin be firm or clammy, hot or cold, and each of such signs is of significance. In this group of diseases cure should be complete, not because such diseases are necessarily more amenable to treatment, but simply because the cure has been discovered. And the discoveries were made by no chance comers, but by experts who were in a position to make them. However, anyone can be trained to be an expert who is lacking neither in education nor intelligence.

10. There should be no difficulty, then, in the management of these obvious or external diseases, but the less obvious or internal diseases should not be wholly beyond the power of the science. In this latter group I include disease of the bones and of the cavities of the body. The body contains many hollow organs; there are two which receive and pass on the food and many others which those who have studied them will know. Every part of the body which is covered with flesh or muscle contains a cavity. Every separate organ, whether covered by skin or muscle, is hollow, and in health is filled with life-giving spirit; in sickness it is pervaded by unhealthy humours. The arms, for example, possess such a cavity, as also do the thighs and legs. Even those parts which are relatively poorly covered with flesh contain such cavities. Thus the trunk is hollow and contains the liver, the skull contains the brain and the thorax the lungs. Thus the divisions

of the body may be likened to a series of vessels, each containing within it various organs, some of which are harmful and some beneficial to their possessor. There are in addition many blood-vessels and nerves which do not lie loose among the muscles but are attached to the bones and ligaments which form the joints. The joints themselves, in which the ends of the bones turn, are enclosed by capsules which contain a frothy fluid. Should the joint be opened, large quantities of fluid escape and much damage is done.

11. Since these diseases cannot be diagnosed by sight, I call them 'internal diseases' and such is the term employed by the profession. These internal diseases have not been mastered, but they have been mastered as far as possible for the present. The future depends on how far the intelligence of the patients permits the drawing of conclusions and how far the abilities of future investigators are fitted for the task. If the nature of a disease cannot be perceived by the eye, its diagnosis will involve more trouble and certainly more time than if it can. What escapes our vision we must grasp by mental sight, and the physician, being unable to see the nature of the disease nor to be told of it, must have recourse to reasoning from the symptoms with which he is presented. Then when sick men suffer from delay in diagnosis, it is due rather to the nature of the disease and of the patient than to the failure of the physician. It is made more difficult by the fact that the symptoms which patients with internal diseases describe to their physicians are based on guesses about a possible cause rather than knowledge about it. If they knew what caused their sickness they would know how to prevent it. To know the cause of a disease and to understand the use of the various methods by which disease may be prevented amounts to the same thing in effect as being able to cure the malady. When the physician cannot make an exact diagnosis from the patient's description of his symptoms, the doctor must employ other methods for his guidance and any delay in diagnosis is due to the nature of the human frame rather than to a failure of the science of medicine. Medicine aims to cure that which is perceived, treatment being based on judgement rather than on ill-

considered opinion, on energy rather than indifference. The nature of the body is such that a sickness which is clearly seen can be cured. However, a disease may progress rapidly while the diagnosis is slowly becoming apparent to the physician and the patient cannot be saved in time. The progress of a disease is never faster than the speed with which it may be cured and, so long as the administration of remedies begins with the onset of the malady, recovery may be expected. But when the disease has a start because it lurks unseen within the body, a sufferer seeks treatment not when first attacked but only after his malady has gained a firm hold.

12. Thus the efficacy of the science is better demonstrated when it succeeds in relieving an internal malady than if the cure of an apparently hopeless case should be attempted. Different principles guide other crafts. A trade in which the use of fire is necessary cannot be practised in the absence of this element. Further, other crafts are exercised on materials in which mistakes can easily be rectified, as is the case with those which employ wood or hides, or in the craft of engraving on bronze, iron or similar metal. A mistake made in the manufacture of articles from such materials is easily corrected, but the craft cannot be practised at all if one of the materials be missing. Again, the time factor is not of importance and careful workmanship produces better results than speed, although the latter may prove more profitable.*

13. But although neither deep abscesses nor diseases of the kidneys nor of the liver nor of other organs situated within the body are visible to the eye, which is the most satisfactory way of observation, medicine has none the less found out means by which a diagnosis may be reached. Such means consist of observations on the quality of the voice, whether it be clear or hoarse, on the respiratory rate, whether it be quickened or slowed, and on the constitution of the various fluids which flow from the orifices of the body, taking into account their smell and colour, as well as their thinness or viscosity. By weighing up the significance of these various signs it is possible to deduce of what disease they are the result, what

*It is possible that something has been lost from the text of this section.

has happened in the past and to prognosticate the future course of the malady. Even when nature herself does not produce such signs, they may be revealed by certain harmless measures known to those practised in the science. Thus the physicians may determine what remedies should be applied. For instance, a patient may be made to rid himself of phlegm by the administration of certain acid draughts and foods. Thus a visible sign is produced of some underlying disease which could not otherwise be demonstrated to the sight. If a patient be made to walk uphill or to run, abnormalities in respiration will be observed which would not be apparent at rest. By producing sweating in the manner just mentioned the signs of fever can be observed, just as the steam from hot water indicates fire. Substances can be given which, excreted in the urine, or through the skin, reveal the disease better. Then draughts and substances taken by mouth have been discovered, which, producing more heat than the cause of some fever, act on that cause and make the fever flow away, a result which would not happen but for the exhibition of such treatment. But both the methods to be employed and the signs produced differ from case to case. As a result the signs may be difficult for the physician to interpret and then cures are slow and mistrust in the power of the doctor persists.

14. That the science of medicine makes use of principles which can be of real assistance has been shown in this work. But it would not be fair to expect medicine to attempt cures that are all but impossible, nor to be unfailing in its remedies. That medicine can be of value is further demonstrated by the skill of those proficient practitioners whose actions are better proof than their words. It is not that such physicians look down on writers, but they believe that most men are more ready to believe what they see than what they hear.

AIRS, WATERS, PLACES

An essay on the influence of climate, water supply and situation on health.

1. Whoever would study medicine aright must learn of the following subjects. First he must consider the effect of each of the seasons of the year and the differences between them. Secondly he must study the warm and the cold winds, both those which are common to every country and those peculiar to a particular locality. Lastly, the effect of water on the health must not be forgotten. Just as it varies in taste and when weighed, so does its effect on the body vary as well. When, therefore, a physician comes to a district previously unknown to him, he should consider both its situation and its aspect to the winds. The effect of any town upon the health of its population varies according as it faces north or south, east or west. This is of the greatest importance. Similarly, the nature of the water supply must be considered; is it marshy and soft, hard as it is when it flows from high and rocky ground, or salty with a hardness which is permanent? Then think of the soil, whether it be bare and waterless or thickly covered with vegetation and well-watered; whether in a hollow and stifling, or exposed and cold. Lastly consider the life of the inhabitants themselves; are they heavy drinkers and eaters and consequently unable to stand fatigue or, being fond of work and exercise, eat wisely but drink sparely?

2. Each of these subjects must be studied. A physician who understands them well, or at least as well as he can, could not fail to observe what diseases are important in a given locality as well as the nature of the inhabitants in general, when he first comes into a district which was unfamiliar to him. Thus he would not be at a loss to treat the diseases to which the inhabitants are liable, nor would he make mistakes as he would certainly do had he not thought about these things beforehand. With the passage of time and the change of the seasons, he

would know what epidemics to expect, both in the summer and in the winter, and what particular disadvantages threatened an individual who changed his mode of life. Being familiar with the progress of the seasons and the dates of rising and setting of the stars, he could foretell the progress of the year. Thus he would know what changes to expect in the weather and not only would he enjoy good health himself for the most part but he would be very successful in the practice of medicine. If it should be thought that this is more the business of the meteorologist, then learn that astronomy plays a very important part in medicine since the changes of the seasons produce changes in diseases.

3. I shall explain clearly the way in which each of these subjects should be considered. Let us suppose we are dealing with a district which is sheltered from northerly winds but exposed to the warm ones, those, that is, which blow from the quarter between south-east and south-west; and that these are the prevailing winds. Water will be plentiful but it will consist chiefly of brackish surface water, warm in the summer and cold in the winter. The inhabitants of such a place will thus have moist heads full of phlegm, and this, flowing down from the head, is likely to disturb their inner organs. Their constitution will usually be flabby and they tolerate neither food nor drink well. It is a general rule that men with weak heads are not great drinkers because they are particularly liable to hangovers.

The local diseases are these. The women are sickly and liable to vaginal discharges; many of them are sterile, not by nature, but as the result of disease. Miscarriages are common. Children are liable to convulsions and asthma which are regarded as divine visitations and the disease itself as 'sacred'. The men suffer from diarrhoea, dysentery, ague and, in the winter especially, from prolonged fevers. They are also subject to pustular diseases of the skin which are particularly painful at night and also from haemorrhoids. Pleurisy, pneumonia and other acute diseases are rare since such diseases do not flourish in a watery constitution. Moist ophthalmia is not uncommon, but it is neither serious nor of long

duration unless an epidemic breaks out owing to some great change in the weather. Catarrh of the head makes those over fifty liable to hemiplegia. They suddenly become 'sunstruck' or cold. Such then are the diseases of the country, except that changes in the weather may produce epidemics in addition.

4. Let us now take the case of a district with the opposite situation, one sheltered from the south but with cold prevailing winds from the quarter between north-west and north-east. The water supply is hard and cold and usually brackish. The inhabitants will therefore be sturdy and lean, tend to constipation, their bowels being intractable, but their chests will move easily. They will be more troubled with bile than with phlegm; they will have sound and hard heads but suffer frequently from abscesses. The special diseases of the locality will be pleurisy and the acute diseases. This is always the case when bellies are hard. Because of this too, and because they are sinewy, abscesses commonly appear on the slightest pretext. This is also due to their dryness and the coldness of the water. Such men eat with good appetites but they drink little; one cannot both eat and drink a great deal at the same time. Ophthalmia occurs and is of long duration tending to become both serious and chronic, and the eyes suppurate at an early stage. Those under thirty suffer from epistaxis which is serious in summer. Cases of the 'sacred disease' are few but grave. These men live longer than those I described before. Ulcers do not suppurate nor do they spread wildly. Characters are fierce rather than tame. These then are the diseases to which the men of such a district are liable; others only if some change in the weather provokes an epidemic.

The women suffer largely from barrenness owing to the nature of the water; this is hard, permanently so, and cold. Menstruation, too, does not occur satisfactorily but the periods are small and painful. They give birth with difficulty but, nevertheless, miscarriages are rare. After parturition they are unable to feed their babies because the flow of milk is dried up by the intractable hardness of the water. As a result of difficult labour, abscesses and convulsions commonly occur and