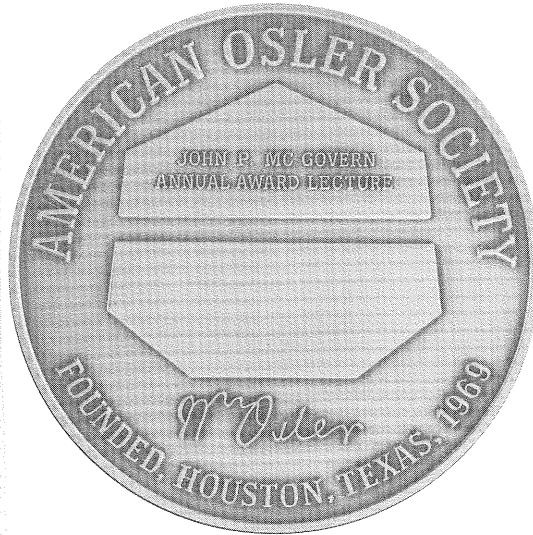


American Osler Society, Inc., John P. McGovern Award Lectureship

Why We Go Back to Hippocrates

Paul Potter

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Potter, Paul.

Why we go back to Hippocrates.



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6. *Osler's Gamble and Ours: The Meanings of Contemporary History* presented by Daniel M. Fox, April 10, 1991, in New Orleans, Louisiana.
7. *From Doctor to Nurse with Love In a Molecular Age* presented by William C. Beck, March 26, 1992, in San Diego, California.
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10. *A Body of Knowledge: Knowledge of the Body* presented by Sherwin B. Nuland, May 10, 1995, in Pittsburgh, Pennsylvania.
11. *Other People's Bodies: Human Experimentation on the 50th Anniversary of the Nuremberg Code* presented by David J. Rothman, April 25, 1996, in San Francisco, California.
12. *The Coming of Compassion* presented by Roger J. Bulger, April 3, 1997, in Williamsburg, Virginia.
13. *Why We Go Back to Hippocrates* by Paul Potter, May 6, 1998, in Toronto, Ontario

Cover - Obverse and reverse sides of John P. McGovern Award Lectureship commemorative medal which is presented to each annual lecturer.

The Thirteenth John P. McGovern Award Lecture



Why We Go Back to Hippocrates

by

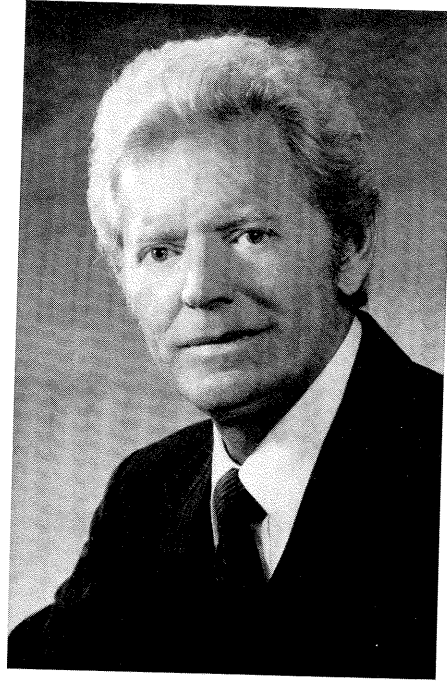
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Delivered 6 May 1998 at the
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the American Osler Society
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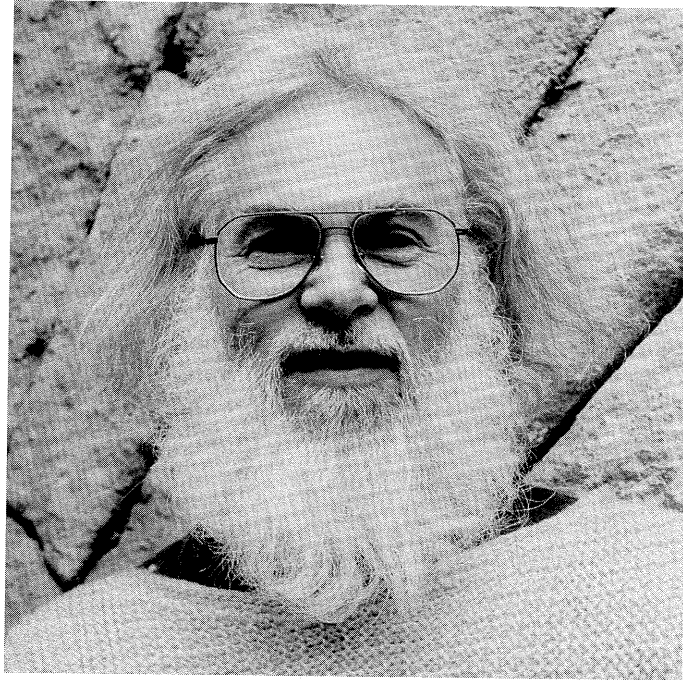
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John P. McGovern, M.D.

John P. McGovern Award Lectureship

Through the generosity of the John P. McGovern Foundation to the American Osler Society, the John P. McGovern Award Lectureship was established in 1986. The lectureship makes possible an annual presentation of a paper dedicated to the general areas of Sir William Osler's interests in the interface between the humanities and the sciences — in particular, medicine, literature, philosophy, and history. The lectureship is awarded to a leader of wide reputation who is selected by a special committee of the Society and is especially significant in that it also stands as a commemoration of Doctor McGovern's own long-standing interest in and contributions to Osleriana.



Paul Potter

Paul Potter

Paul Potter, born 1944 in Hamilton, Ontario, is Jason A. Hannah Professor, and Chairman of the Department of History of Medicine at the University of Western Ontario in London, Canada.

After graduating M.D.,C.M. at McGill University in 1968, he turned to a full-time study of the Classics, first at McMaster University in his native city, and then in Kiel, Germany, where he was awarded the Dr.phil. in 1973 for his dissertation on the Hippocratic treatise *Diseases III*. In 1974 he became a member of the Faculty of Medicine at the University of Western Ontario, where he has since taught a wide variety of students and carried on research in several areas of Medical History.

Dr. Potter's primary research commitment has been to the ancient Greek medical writings, in particular those transmitted under the name of Hippocrates of Cos. His editions and translations have appeared in the *Corpus Medicorum Graecorum* (Akademie Verlag: Berlin, 1980) and the Loeb Classical Library (Harvard University Press: Cambridge, MA, 1988-95).



Life is short, the art is long.

With the name Hippocrates, Western medicine connects its earliest and most formative phase, the ancient Greek roots from which it has continued to draw its nourishment, both technical and professional, for almost two and a half millennia. In the pages that follow, an attempt will be made to illustrate just what it is we owe to this remarkable era, and why its influence has been, and must continue to be, so fundamental for us.

But before I turn to the writings attributed to Hippocrates themselves, let me first say a few words about the Greek world into which Hippocrates was born, some time around 460 BC, and in which he grew up. Long before his medical instruction began, Hippocrates' world view would have been shaped by two powerful forces: the tradition of storytelling embodied in the Homeric Epics, the *Iliad* and the *Odyssey*, which dated back several centuries by his time; and the habit of uninhibited questioning about the universe and man's place in it which had begun with philosophers like Thales and Xenophanes in the sixth century, and which by the middle of the fifth century had come to pervade every aspect of Greek thought and expression, from the plastic arts to politics, from poetry to drama, from astronomy to architecture.

The Homeric poems formed the centerpiece and touchstone of all Greek education, linguistic, political, and religious. The heroes, if not exactly models to live by, did incorporate the virtues and weaknesses which characterize human life at its deepest level, the gods, if no better than they should be in their personal behavior, did present a regulatory framework within which the events of individual and collective human life might be connected and explained. It was the world of Achilles and Odysseus, together with the language itself of the poems, which gave Greek culture its identity, and from which every specific human activity

took its beginning. About the healer (*iatros*, derived from the verb *iaomai* "I heal") and his art, Homer's few explicit statements confirm little more than that by the eighth century BC healing was a highly valued skill (*Iliad* 11, 514), and that its practitioners belonged to the class of itinerant experts that included, as well, the seer, the bard and the architect (*Odyssey* 17, 383-4).

Perhaps most influential in Hippocrates' formation as a future physician were two general features of Homeric thought. First, an unbounded enthusiasm for the details of the sensible world, which encouraged the accurate observation and description of everything from stars and clouds to plants and animals to city walls and works of art, all viewed with a kind of wonder (*thauma idesthai*) not tinged with religious awe. When Odysseus builds a raft, we follow him from the felling of the trees to his preparation of its last technical fixture (*Odyssey* 5, 233-42), when a warrior is wounded, the missile's course is followed (e.g. "the spear . . . struck Sarpedon even where the diaphragm clasps the beating heart" [*Iliad* 16, 480-1]) and its effects explained (e.g. ". . . right through the tender neck went the point, yet the bronze-weighted ashen spear broke not through the windpipe, so that Hector could yet speak" [*Iliad* 22, 328]). Attention to observed detail — even for its own sake —, then, is a basic Greek cultural trait.

The second way of thinking inherent in the Epics which has a special significance for medicine — an art in which the establishment of causal links has always presented particular difficulties —, is a kind of pre-Aristotelian causality. As the action of the poems unfolds, the growth of the present out of the past and towards the future is frequently explained, but not, however, always on the same level. Each Homeric hero has from the moment of his birth a pre-established Fate which determines the main course of his life, and ultimately his death. But each person also has a clearly articulated individual character or personality which informs his acts and gives them a unity and consistency: the Homeric individual's thoughts and actions follow naturally from this character. Thirdly, there are the gods sitting on Mount Olympus who play an active role in influencing the actions and sufferings of their human favorites and/or enemies by specific interventions on land and sea. Now when any event occurs in the poems — for example, when in book twenty-two of the *Iliad* Hector goes forth to meet Achilles in battle and thereby meets his doom — it can be and often is explained on one, two, or even all of the three levels described: a) Although Hector has been told by the dying

Patroclus that he himself will fall by the hand of Achilles (16, 852-4), his patriotism for Troy and his momentary feeling of personal prowess overcome his better judgement, leading him to *decide* to face Achilles (22, 99-130); b) when Zeus weighs the lots of Hector and Achilles, Hector's fatal day sinks to Hades (22, 208ff.); c) as the duel progresses, Apollo, after helping Hector once, suddenly deserts him, while Athena appears as helper at Achilles' side (22, 216ff.). This sophisticated poetic device often leads to contradictory statements by the poet about the hierarchy of these causes: occasionally, it would seem that a god, in particular Zeus, might be able to override Fate, or at least to postpone what is fated (*Iliad* 16, 852-4), while in the general case Fate is clearly held to be supreme; sometimes a hero's character leads apparently by itself to his destruction, at other times his death seems to be determined by his Fate alone, or by the direct act of a god; and so forth. Hippocrates, like us, faced many medical cases in which the competing causalities of e.g. 1) a specific preceding event, 2) life-style in general (*diaite*, in Greek), and 3) environmental or epidemiological factors all seemed to be implicated, but where the interactions between the discrete causal chains of events leading to the same disease occurrence were indeterminable. That the Hippocratic writers are willing to describe illnesses unbiasedly, to hypothesize about their possible causes on many levels, but ultimately to leave the question of causal hierarchy open is a Homeric heritage.

This general interest in natural phenomena and their causes displayed in the Homeric writings evolved, by the sixth century BC, in such a way that the actions of the gods — especially the anthropomorphic Homeric gods — in the world came to be regarded as merely a poetic or metaphorical expression for processes henceforth to be explained in terms of physical (*physis* in Greek means "nature") abstractions: number, form, material, space, the forces of attraction, repulsion, mixing, separation, etc. This new turn of mind first appeared in the Greek city states along the Ionian coast of Asia Minor (the island of Cos, Hippocrates' birthplace lies just off this coast), especially Miletus and Ephesus, as well as in several Greek colonies of southern Italy such as Agrigentum and Croton.

These new thinkers sought to discover through observation and/or speculation the regular, permanent entities "behind" the inconstant, ever-changing appearances of the observed world. Some put forward the theory that some single indestructible material "beginning" (*arche*) underlay everything: water (Thales), air (Anaximenes), fire (Heraclitus), or some

indeterminate element, "apeiron" (Anaximander); for others it was a combination of the four elements, earth, air, fire and water (Empedocles) exchanging places within a "full" universe, or again numberless finite particles (*atomoi*) ricocheting off one another in the void (Democritus), that explained the world. Other materialist thinkers asked questions such as how a baby is able to convert its sole nourishment, milk, into all the tissues of its body (Anaxagoras), or how a specific plant's roots "know" which elements to extract from the soil to give it its particular essence.

Numbers as determinants of reality were also closely studied: Pythagoras analyzed musical sounds mathematically according to the relative lengths of lyre-string that produced them, expressing the notes of the scale as ratios. Empedocles, combining the material with the numerical, gave us our first — admittedly highly speculative — chemical formula: bone is four parts fire, two parts earth and two parts water (Fragment 96).

This philosophical study of nature reached its acme just at the time of Hippocrates' youth. Secondary education in fifth century Greece was acquired by listening to the public lectures delivered by various of these travelling "sophists" in the town gymnasium, or even by attaching oneself to one of them for a fee, with whom one then travelled about Hellas for a number of years learning the master's precepts. This was the immediate intellectual background against which the writings of the Hippocratic Collection were written, in whose terms their theoretical discussions are framed.

The body of approximately seventy writings, ranging in length from one page, e.g. the *Oath*, to several hundred pages, e.g. *Diseases of Women* 1-3, that constitute the Hippocratic Collection date in the main — as far as scholars can tell — from Hippocrates' lifetime, or a little later, from about 440-360 BC. The actual relationship of the individual treatises, which vary considerably in their medical theories, their areas of interest, and their literary form, to the historical Hippocrates, to whom both Plato (427-349) and Aristotle (384-322) refer as a leading physician of the fifth century, has been discussed since at least the first century AD (cf. Erotianus, *On Hippocratic Words*, preface), probably even much earlier, without any generally agreed upon conclusions being reached: the possibility that all seventy writings are by Hippocrates is definitely excluded by their diversity alone; that none are by Hippocrates, who according to Plato had established a wide reputation for his medical theories and practice by about 433 BC (*Protagoras* 311b; cf. *Phaedrus* 270c-e), seems almost

equally improbable. Let us for today leave the debate about specific cases to the historical scholars, and work on the principle that the majority of the Collection, which does indeed tend rather towards a unity of medical and surgical viewpoint than to the contrary, represents medicine as Hippocrates taught and practiced it, and call this Hippocratic medicine.

In what follows I shall present a number of Hippocratic passages — some well known, others less so — that seem to me to illustrate their medicine's main features; not surprisingly, much of what appears here has palpable intellectual connections to the Homeric and early philosophic thought mentioned above. As five defining features of this medicine, let us examine the headings: 1) clinical observation; 2) theoretical reasoning; 3) the use of experience and experiment; 4) medicine's intermediate position between a science and an art; 5) the art of therapy.

William Osler, in his *Principles and Practice of Medicine* (1st edn, 1892), refers explicitly to Hippocratic texts fourteen times, many of them containing clinical observations. Perhaps most famous among these descriptions are the *facies hippocratica* of the cachexic patient from *Prognostic* 2 (Osler, p. 464), the clubbed or Hippocratic fingers associated with disease of the chest from *Internal Affections* 10 (pp. 230 and 992), the "winged scapulae" of consumption from *Epidemics* 3, 14 (pp. 192 and 225), and the principal features of the epileptic attack detailed in *Sacred Disease* 10 (p. 951). This habit of careful observation among the Hippocratic writers upon which Osler draws includes, besides a very considerable number of signs and symptoms, both longitudinal studies seeking to relate heredity, habits and disease (cf. Osler quoting on gout from *Prorrhetic* 2 8, p. 287, and on epilepsy from *Prorrhetic* 2 9, p. 954) and community studies attempting to bring the morbidity and mortality observed in individual communities into relationship with their geographical position, their water supplies, and the winds to which they are subject (*Airs, Waters, Places*) and recording the annual health status of specific places in specific years (*Epidemics* 1 and 3). As an example of a general disease description, I quote the first recorded account of mumps:

Many had swellings beside one ear, or both ears, in most cases unattended with fever, so that confinement to bed was unnecessary. In some cases there was a slight heat, but in all the swellings subsided without causing harm; in no case was there suppuration such as attends swellings of other origin. This was the character of them: flabby, big, spreading, with neither inflammation nor pain; in every case they disappeared without a sign. The sufferers were youths, young men, and men in their prime, usually those who frequented

the wrestling school and gymnasia; few women were attacked. Many had dry coughs which brought up nothing when they coughed, but their voices were hoarse. Soon after, though in some cases after some time, painful inflammations occurred either in one testicle or in both, sometimes accompanied with fever, in other cases not: usually they caused much suffering. (*Epidemics 1, 1*)

It was observations like these which, coupled with clinical reasoning, led to the general theory of epidemic disease causation in men and animals put forward in *Breaths 6*:

Now epidemic fevers occur this way because all men inhale the same air; and when the same air has been taken up by the same kind of bodies, the same fevers result So whenever the air has been infected with pollutions (miasmas) that are hostile to the human body, men will become ill, but when the air becomes unsuitable for some other species of animals, then they will become ill.

This type of reasoning direct from the observed features of disease was often extended to include various semi-hypothetical bodily substances and processes in a way analogous to the "chemical" reasoning of the philosophers mentioned above. Most frequently, reference was made to certain fluid components of the body — either the pair phlegm and bile, or, by the addition of blood and black bile, the canonical four humours, which mirror Empedocles' system of the four elements. It was changes in these fluids, explained according to generally held principles involving rarefaction and condensation, warmth and cold, attraction towards an empty space, and the tendencies of heavy things to move downwards and of light things to move upwards, that were held to lead — often directly and naively — to observed signs and symptoms: e.g.

When the head becomes overheated, the patient passes much urine; for the phlegm in the head melts, and, as it melts, some runs to the nostrils, some to the mouth, and some through the vessels that lead to the genital parts: when it arrives in these parts, the patient urinates frequently, and strangury develops. (*Diseases 2, 1*)

Sciatica usually arises as follows: if a person is exposed for a long time to the sun, and his hip-joints become heated, the moisture in them is dried up by the burning heat. My proof (*tekmerion*) that the moisture is dried up and congealed is this: the patient cannot turn and move his joints, because of the pain in them, and because his vertebrae have become fixed. (*Internal Affections 51*)

From these cases, and many more like them, the important roles that observation of and reasoning about naturally occurring disease phenomena play at the centre of Hippocratic medicine are evident. But what about the experiment, the artificially created situation from which evidence can be gathered to test a specific hypothesis? In fact, examples — albeit infrequent and varying in their degrees of perfection — of the experimental method are found in both the clinical and the theoretical writings of the Collection.

These experiments are included in the general category of evidence called a sign (*semeion*), proof (*tekmerion*), or witness (*martyrion*), of which a clinical example is quoted above in an account of sciatica. Presumably because the experimental method was just in the process of being formulated, our writers use it with a considerable degree of freedom, not to say looseness: the hypotheses being tested are often left implicit, quantities are rarely measured, the conclusions drawn are frequently not logically justified from the evidence — in fact even whether the experiment being described was actually carried out or remained in the “thought-experiment” stage usually remains unsure.

A number of clinical tests clearly represent simple experiments: e.g.

[In cases of empyema] soak a piece of fine linen in warm, moist, finely ground clay; then wrap this around the patient’s chest, and, wherever it first dries, that is where you must cauterize or incise, as close to the diaphragm as possible, but sparing the diaphragm itself. (*Diseases* 3 16)

. . . if you cannot otherwise distinguish by inspection whether the skull is fractured or contused or even both, then you must apply to the bone a very black solution and anoint the wound with the same Next day, after opening and cleaning the wound, scrape further, and, if it is not sound but fractured and contused, the rest of the bone after scraping will be white, but the fracture and the contusion will have absorbed the solution and will appear black in the white bone. (*Wounds in the Head* 14)

This is how you can tell he is blind: if you bring your finger near his eye, he does not blink. (*Internal Affections* 48)

Pinch the patient with three fingers: if he feels it, his condition is hysterical, if not, his condition is spastic. (*Regimen in Acute Diseases* [Appendix] 68)

In the theoretical discussions of the Collection, over a dozen experiments are described, most seriously flawed methodologically in the ways

noted above. The author of the embryological treatise *On the Nature of the Child*, however, puts forward an experiment with a much more modern ring.

If you take twenty or more eggs and place them to hatch under two or more hens, and on each day, starting from the second right up to the day on which the egg is hatched, you take one egg, break it open and examine it, you will find everything as I have described it. (chapter 29)

A physical experiment involving actual measurements is cited in *Airs, Waters, Places* 8 as proof that water on freezing loses a part of its material essence:

Pour by measure, in winter, water into a vessel and set it in the open, where it will freeze best; then on the next day bring it under cover, where the ice will melt best; if when it is melted you measure the water again, you will find it much decreased in amount.

The unreserved confidence with which the Hippocratic writers expound their scientific views based in observation, reasoning, and to a limited degree experimentation reflects a professional maturity which no doubt grew out of generations, probably centuries of collected experience:

Medicine has long had all its means to hand, and has discovered both a principle and a method, through which the discoveries made during a long period are many and excellent; and what remains will be discovered if the inquirer is competent and conducts his researches with knowledge of the discoveries already made, and makes them his starting point. But anyone who, casting aside and rejecting all these means, attempts to conduct research in any other way or after another fashion, and asserts he has found anything out, both deceives others and is deceived himself. (*Ancient Medicine* 2)

But if medicine's method is as secure as this writer claims, why is medical practice so difficult, a fact repeatedly stressed throughout the Collection in passages such as the one from *Aphorisms* 1 that Osler chose for the motto of the *Principles and Practice*: "experience is fallacious, judgement difficult?" The answer to this question lay for the ancients in medicine's middle position between a science and an art. Whereas a pure science such as geometry is a system of reasoning consistent and complete in itself apart from the every day world, and may thus be reduced

to a totally rational basis, medicine as practice most definitely belongs to the world of appearances: the physician is called upon to deal with diseases whose causes may be partly elucidated by his science, but whose manifestations in the individual patient are subject to an almost infinite set of variables:

Among persons that have these and similar diseases, a man differs from a woman in the ease or difficulty with which he recovers, a younger man differs from an older man, and a younger woman differs from an older woman; additional factors are the season in which they have fallen ill, and whether or not their disease has followed from another disease. Besides, one affection differs from another, being greater or less, one body from another, and one treatment from another. (*Diseases 1 22*)

And thus:

Medicine cannot be learned quickly because it is impossible to create any established principle in it, the way that a person who learns writing according to the single system people teach understands everything; for all who understand writing in the same way do so because the same symbol does not sometimes become opposite, but is always steadfastly the same and not subject to chance. Medicine, on the other hand, does not do the same thing at one moment and the next, and it does opposite things to the same person, and sometimes even things that are contradictory to one another. (*Places in Man 41*; cf. 42-6)

There is no demonstrated starting point of healing, which truly is the starting point of the whole art (*techne*), nor any second point, nor any middle, or end. But rather we begin in it sometimes by speaking, at other times by acting, and we end in like manner; nor, when we begin by speaking, do we begin with the same words, not even if we are speaking about the same thing, nor do we end with the same words. In the same way, when we begin by acting, we do not begin with the same actions, nor do we end with the same ones. (*Diseases 1 9*; see chapters 1-10 in general)

But in spite of this complexity, or for that matter medicine's limited practical effectiveness — which was well appreciated — , the enterprise is not to be abandoned as impossible, only accepted as being a difficult one. The clinical judgement that each practitioner must learn consists in appreciating both the value and the limits of rational thought in practice, and in knowing how to be guided by the individual patient's responses, even to the point of apparent theoretical nonsense: e.g.

If the (sc. hot) disease does not slacken when treated with cold compresses, switch over and use the leather skin to warm. (*Diseases 2 16*)

. . . the principle would be established that sometimes conditions can be treated by things opposite to those from which they arose, and sometimes by things like to those from which they arose. (*Places in Man 42*)

From this methodological insecurity in practice there could not but follow a degree of professional insecurity. The physician was constantly in the position of applying an art whose results were open to more than one interpretation: e.g.

Generally speaking, people blame the physician, in diseases and wounds, even for the evils that follow of necessity from other evils, when these occur, not recognizing the constraint that makes such things happen. If he attends a patient with a fever or a wound, and fails at first to help him by his treatment, but on the next day the patient is worse, people blame the physician; but if he does help the patient, people do not praise him in due proportion, for they hold the patient's improvement to have been a matter of course. (*Diseases 1 8*)

In this difficult situation, writers sought to clarify the goals and responsibilities of the clinical intervention:

. . . with these (sc. acute diseases) let nothing bad be added by the person treating — rather let the evils resulting from the diseases themselves suffice — but only whatever good he is capable of. If, when the physician treats correctly, the patient is overcome by the magnitude of his disease, this is not the physician's fault; but if, when the physician treats either incorrectly or out of ignorance, the patient is overcome, it is. (*Affections 13*)

and to define its parameters:

As to diseases, make a habit of two things — to help, or at least to do no harm. The art has three factors, the disease, the patient, the physician: the physician is the servant of the art; the patient must work with the physician in combatting the disease. (*Epidemics 1, 11*)

If the medicine that emerges from this account seems, in spite of its obvious strengths, to be riven with contradictions between science and art, between theory and empiricism, between confidence and doubt, between naïveté and profundity, then it can rightfully take its place among its peer disciplines in classical Greek culture. This was an age when the ambiguity and ambivalence of human life in all its aspects were at the centre of attention. On the one hand, "Man is the measure of all things, of the things that are, that they are, of the things that are not, that they are not" (Protagoras, Fragment 1), on the other, "There are many *deina* (marvellous, powerful, clever, dangerous, terrible) things in the world, but nothing is more *deinon* than man" (Sophocles, *Antigone* 332-3).

Hippocratic medicine, classical medicine, in striving to face openly the essential challenges that lie at the heart of the healing endeavor, presented all succeeding ages with a set of questions and potential answers that could never again go unasked or unfaced. When Thomas Sydenham, or René Laennec, or William Osler turn back to these writings in formulating their methods and seeking their models, they are not paying lip-service to a superceded historical stage in the development of their art, they are seeking help from an age which in some ways saw with a mental clarity never again achieved in the West, probed with an intellectual fortitude lost to its heirs. It is for this reason that they, and we, go back to Hippocrates.



Instead of a Bibliography

Greek and Latin editions accompanied by facing English translations of most ancient texts are available in the Loeb Classical Library published by Harvard University Press, Cambridge, MA. However, because many of these translations go back to the beginning of the present century and are in verse, they often fail to meet the requirements of the contemporary reader, who is better served by the less extensive but more modern series of translations published by Penguin Classics.

References to classical texts are generally standard in modern editions and translations, referring either to author, title, "book" and verse in poetry (e.g. Homer, *Iliad*, book 11, verse 514) and author, title, "book" and chapter in prose writers (e.g. Hippocrates, *Diseases of Women*, book 1, chapter 62), or to author, title, page and section in certain standard editions (e.g. Plato, *Protagoras*, page 311, section b, in the Stephanus edition of 1578, whose page and section numbers are indicated in the margins of all modern Plato editions).

In the two series mentioned in the first paragraph above, the ancient medical writers are not well represented, a situation which is being remedied to a degree by the addition of new volumes. The eight *Hippocrates* volumes in the Loeb series now contain over two thirds of the Hippocratic Collection, arranged more or less at random. For a general overview of the individual Hippocratic treatises and the medicine they represent, I refer the reader to Jacques Jouanna, *Hippocrate*, Paris 1992, or more briefly, Paul Potter, *A Short Handbook of Hippocratic Medicine*, Quebec 1988.