

THE GREAT PLAGUE OF ATHENS

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A pestilence of such extent and mortality was nowhere remembered. Nor were the doctors able to ward off the disease as they treated the sick at first in their ignorance;¹ but their own mortality was especially heavy inasmuch as they approached the afflicted most frequently . . . All speculation as to its origin and its causes . . . I leave to other writers, whether lay or professional; for myself I shall simply set down its nature, and explain the symptoms by which perhaps it may be recognized . . . if it should ever break out again.

Thucydides, *The Peloponnesian War*, Book II.47–48.

The Great Plague of Athens has been confidently identified with a great variety of diseases which range through bubonic plague, smallpox, measles, ergotism and epidemic typhus—not to mention anthrax, scarlet fever, typhoid fever, syphilis, malaria and dengue fever. That this should be the case should not occasion surprize: for, in the first place, the clinical pictures of the early stages of several acute infectious diseases, notably epidemic typhus, murine typhus, smallpox, relapsing fever, malaria, typhoid fever, measles and yellow fever closely resemble each other and, even in a more modern age, it has sometimes proved difficult to identify the specific disease at play. To take a particular example, it may be noted that an epidemic of dengue fever, which broke out in 1951 in the tea gardens of Northern Assam, was at first falsely diagnosed as measles.² It should not be forgotten, too, that typhoid fever was not recognized as a separate disease from typhus until as late as the early nineteenth century. Again, diagnosis at second hand from a literary account poses obvious problems—not least being the difficulty in assessing the degree of subjectivity inherent in the author's account. Although Thucydides has been praised for the objectivity of his description of the Plague and he expressly tells us that he observed the sufferings of others affected by the disease, the fact that he himself fell victim to it would itself, almost inevitably, entail an element of subjectivity at least. The temptation to regard his own symptoms as the norm would be overwhelming. But his very survival could suggest that his own experience was not exactly typical. Furthermore, it should also be borne in mind that an infectious disease has a more virulent effect when it attacks a society which has not been previously exposed to it—witness, for example, the terrible havoc caused by the Black Death in the middle of the fourteenth century, the epidemic of smallpox among the

Aztecs in the sixteenth century, and that of measles in the Fijian Islands in 1875—and Thucydides's account certainly seems to suggest that he is describing the onset of a new and highly contagious febrile disease upon a virgin society.³ Nor should it be overlooked that the impact of a disease can be modified by nutritional conditions, that symptoms can vary in accordance with diet, and, indeed, may even change altogether as diseases adapt over the passage of time to new hosts under changing environments.⁴ Bearing each of these factors in mind, then, I propose to divide my discussion of the Athenian Plague into three parts, an introduction, an examination of Thucydides's account, and, finally, I shall discuss the more plausible and/or more popular of the various attempts to identify the disease in what may be described as a "descending order of improbability".

I

The Great Plague of Athens broke out in 430 BC and raged ferociously during that year and the next. It subsided and then broke out again in 427 BC, wiping out about one third of the population of the city⁵—a higher proportion incidentally than that of mediaeval London carried off by the Black Death. But before turning to Thucydides's account, as stated above, a few introductory remarks would be appropriate.

One of my colleagues has recently floated the highly provocative suggestion that Thucydides's description of the Plague is a purely literary invention for historiographical purposes. If his thesis were correct, there would be little point in trying to identify a disease, which is itself described as part of an imaginary literary construct. It is, perhaps, worth bearing in mind that imaginary accounts of plague are employed elsewhere in literature, for example in Defoe's *Journal of the plague year*, and Camus employs plague in Oran to symbolize the Nazi occupation of France.⁶ However, I, for my part, would most emphatically reject this suggestion, although I am prepared to concede that the Plague is dramatically exploited by Thucydides for historiographical purposes. The stark and immediate contrast between the optimism and confidence of the Funeral Oration and the grim ravages of the Plague is heightened by their tight juxtaposition which can hardly be fortuitous. But, nevertheless, I cannot believe that Thucydides would explicitly declare his purpose to leave to posterity a description of the symptoms, whereby the disease could be recognized should it ever recur, if it was, in fact, a figment of his own literary imagination. Surely that would be too disingenuous? Furthermore, we should not overlook the fact that Thucydides's whole methodology in history is itself markedly influenced by the procedures of contemporary medical science. Thucydides saw human history as a "great case-book of

social pathology", and sought in his account of the Peloponnesian War to depict as accurately and objectively as possible the true course, the symptoms and the causes of that long malaise. His careful description of the symptoms of the Plague epitomizes both his general historical methodology and his historical purpose. Had he applied the same analytical procedure to a purely imaginary event of that war, a fiction devised for a purely historiographical purpose (the Plague), he would surely have run a grave risk of seriously weakening his proud claim to have written a *history* which was to be a "possession for ever". And in this connection we must not overlook the fact that Thucydides is describing a *contemporary* war. Thus particular invention here would inevitably lead to general disrepute.

This brings me to my second point, already partially adumbrated above. Before attempting to identify the disease described by Thucydides, the question must first be raised what medical authority, if indeed any, underlies his description, and what weight can be placed upon the terminology used by him. Is he simply a layman, as some scholars believe,⁷ who uses loosely descriptive terms in his attempt to depict the symptoms, or, on the other hand, does he employ with precision the technical terminology of contemporary medical science, as others have claimed? Indeed, was there a technical terminology in existence at the time for him to employ? Page⁸ in a well known article published in the *Classical quarterly* has sought to determine to what extent Thucydides's description is expressed in the "standard terms of contemporary medical science", and concludes that the great majority of the nouns, adjectives and verbs in Chapter 49 do in fact recur as standard terms in the medical writings of the fifth and fourth centuries BC. With this conclusion one can hardly take exception. However, it would nevertheless be most unwise to take the further step, as do some scholars,⁹ and infer that Page's survey shows that Thucydides has founded his description of the Plague upon a strict use of contemporary technical medical terminology. As Adam Parry has pointed out,¹⁰ the great majority of the words discussed by Page appear in common and even poetical usage as well as in the medical writers. Then, as now, terms in popular use are employed in medical treatises and medical terms, in their turn, incorporated into popular speech. It is not, in fact, until Hellenistic times that we find strict technical terminology employed by Greek medical writers to any considerable extent.

However, if it is impossible to demonstrate the influence of contemporary medicine on Thucydides upon a linguistic basis, evidence of this influence, fortunately, can be found elsewhere. He himself reveals some familiarity with medicine when he records that during the course of the disease there occurred "evacuations of bile of every kind for which the doctors have a name". Again, the very fact that Thucydides feels it incumbent upon himself to describe in detail the symptoms of the disease,

itself suggests medical influence. Another similarity between Thucydides and the Hippocratic doctors may be seen in the fact that it was characteristic of the latter to exalt prognosis over diagnosis. For them the object of accurate observation and recording was prognosis, the understanding in advance of the course which the symptoms would follow, the foreknowledge of the development of the disease from beginning to end.¹¹ It may be noticed that, in precisely the same spirit, Thucydides declares (II.48.3) that his object is not to inquire into causes, but to provide the factual evidence necessary for prognosis, so that the physician may in future know in advance the course which the Plague will follow. Furthermore, in a recent study H. R. Rawlings has pointed out¹² parallels between Thucydides and the medical treatise *Ancient medicine* and persuasively argued that the historian has adopted medical theory for historiographical purposes by borrowing the concept of a 'precipitant' (i.e., an antecedent condition which can serve to precipitate disease) from the Hippocratic school.

In view of this close affinity in methodology, there is no good reason to doubt that Thucydides is well versed in contemporary medical literature and influenced by the spirit of Hippocratic medicine.¹³ That an intellectual like Thucydides should be so influenced should not, in any case, be a cause for surprize. Medicine was one of the two great contemporary scientific paradigms. Its influence was pervasive not only throughout the fifth century but also the fourth and beyond. Both Plato and Aristotle clearly reveal this influence. The former bases his psychological doctrine of pleasure and pain, which he expounds most fully in *Republic IX* and in the *Philebus*, but equally implies in the *Protagoras*, *Gorgias*, and *Timaeus*, upon a medical theory which can itself be traced back to the fifth century. Aristotle, as Jaeger has convincingly shown,¹⁴ employs medicine as his model for the conduct of ethical enquiry. But there is really no need to look beyond the fifth century for examples of the widespread influence of medicine, since this influence is clearly discernible in the thought of two of Thucydides's contemporaries at Athens, the philosopher, Anaxagoras of Clazomenae, and the sophist, Protagoras of Abdera. The former's physiological interests have clearly exercised an enormous influence upon his physics,¹⁵ and Protagoras's thought reveals close parallels with the Hippocratic treatise, *Ancient medicine*.¹⁶

The Peloponnesian War broke out in 431 BC. In the early summer of the second year of the war the Peloponnesians invaded Attica and laid waste to the country, whose inhabitants took refuge within the Long Walls and the city consequently became severely overcrowded. Thucydides himself mentions this overcrowding in Chapter 52 and Aristophanes, with comic hyperbole, speaks in the *Knights* (792ff.) of the refugees squatting in casks and birds' nests. We might pause at this point in order to raise two further questions. The first concerns the matter of personal cleanliness and

hygiene of the inhabitants. Had the overcrowding of what can only have been a matter of a few months at most brought about a radical decline in the Athenians' normal standards of cleanliness and sanitation? In short, were they lousy? And, secondly, was the rat endemic in Athens at this time? The louse was certainly rife in Classical Greece. Aristophanes makes jokes about them in the *Peace* (cf. 739ff.).¹⁷ We learn that the lice of Corinth were regarded as especially pernicious and what seems to have been a louse-borne relapsing fever at Thasos is described in the First Book of the *Epidemics*. It is the louse—or rather its infected faeces—which is responsible for the transmission of *epidemic typhus*. I stress this point now in view of Shrewsbury's claim¹⁸ that "before typhus fever can even be considered to be a claimant . . . we need some historical evidence, or at least a strong presumption, that the Athenians were familiar with the black rat, and that they were, at any rate during the summer of 430 BC, a lousy people". But it is, in fact, *murine typhus*—which is not epidemic (and the Athenian disease was manifestly epidemic)—which originates from rodents. The question whether or not the black rat (*Rattus rattus*) was endemic in Classical Greece¹⁹ is an interesting one and, of course, relevant to our enquiry—though not, perhaps, in quite the way that Shrewsbury envisages—since flea-infested rats served as vectors for the rapid spread of bubonic plague in mediaeval Europe and the identification of the Athenian Plague with bubonic plague has been made.²⁰ As far as I know, there is no specific term for rat in Classical Greek, though several terms for mouse exist which seem to have been applied to rodents generally. Nor does there seem to be either a description of the rat in any Classical Greek zoological work or any depiction of it in Classical Greek Art. It would certainly be curious if the rat did not exist in Classical Greece, since it seems to have been endemic in the Egypt of the Pharaohs. Egypt was an important source of corn supply for Greece. It is, therefore, difficult to understand how the rat was not introduced in sacks of grain. Could it be that the rat in Pharonic times had not yet become parasitic on man?

II

Soon after the arrival of the Lacedaimonian army in Attica plague broke out in Athens—a pestilence, we are told, of unprecedented mortality. Thucydides records that it was held to have begun in Ethiopia, spread thence to Egypt and Libya and into most of the Persian Empire. Like the Mediaeval Black Death, which allegedly was brought by twelve galleys to Messene, its first incidence in Europe occurred at a port. It attacked first the population of the Piraeus, occasioning the belief that the Peloponnesians had poisoned the water reservoirs. Here we may trace another parallel with the Black Death, since the Jews, particularly, were accused

of poisoning the wells—presumably as a result of their more hygienic habit of drawing their drinking water from running streams.

That year, Thucydides tells us, had been unprecedentedly free from sickness.²¹ But, when the disease struck, people in good health were attacked without warning. Its onset was marked by violent sensations of heat in the head and redness and burning in the eyes; internally the throat and tongue were *haimatōdē* (i.e., “blood red” rather than “bloody”) and the breath was abnormally malodorous. These symptoms were followed by sneezing and hoarseness, and before long the affliction descended into the chest accompanied by a severe coughing. Whenever it settled in the region of the heart²² it upset it, and evacuations of every kind of bile ensued, accompanied by very great distress. Most patients then suffered an attack of empty retching, producing violent spasms; in some cases soon after the abatement of the previous symptoms, in others much later. (We might pause here to raise the question whether “violent spasms” should be interpreted as indicating mental disorder or simply, and more likely, a strong muscular reaction, which would indicate no such thing. See below, ref. 35.) Externally the body was neither very hot to the touch, nor pale in its appearance, but flushed and livid with an efflorescence of small blisters and sores: *phluktainais mikrais kai helkesin exēnthēkos*.²³ Internally, Thucydides tells us, the heat of the body was such that the victims could not endure even the lightest coverings or linens, they preferred to go naked and would have liked best to throw themselves into cold water.

Shrewsbury,²⁴ followed by Page,²⁵ both protagonists for the identification of the Plague with measles, go to great lengths to draw a parallel here with the behaviour of the Fijian Islanders who, during the initial invasion of the islands by measles in 1875, similarly desired, when afflicted, to immerse themselves in cold water. In addition to using this parallel to support his identification of the Plague with measles, Shrewsbury also seeks to use this phenomenon to invalidate the claim that the disease was smallpox, asserting that “in none of [the accounts of smallpox epidemics] that I have consulted . . . is there any hint that the victims attempted to immerse themselves in cold water . . .”. I discover, however, that the *South Carolina gazette* of 15 December 1759 contains the following editorial comment: “It is pretty certain that the Smallpox has lately raged with great violence among the Catawba Indians, and that it has carried off near one half of that nation, by throwing themselves into the River, as soon as they found themselves ill . . .”. It is worth noting, too, that during the great Influenza epidemic of 1918 the Fijians are once again recorded as having taken to the water in crowds. Thucydides, however, records the specific *motive* for the Athenians’ behaviour—they were constrained by unquenchable thirst. Since great thirst, in any case, occurs in many febrile diseases, arguments from this symptom are fruitless.

Some scholars have argued that these victims of the Plague must have been mentally deranged to seek to throw themselves into wells, and therefore they wish to identify the Plague with a disease characterized by some sort of mental disorder such as typhus. But other than the reference to the ambiguous “violent spasms” mentioned above there is no hint of this in Thucydides’s account. The argument that the sick *must* have been mentally unbalanced or they would not have sought to throw themselves into wells is refuted by the fact that Thucydides, as we have already seen, *explicitly* gives a different—and sufficient—reason for this action.

During the course of the disease its victims were afflicted by an inability to rest, and by insomnia. At the height of the disease the body did not waste away, but surprizingly held out against its ravages. The majority succumbed to the internal heat before their strength was totally exhausted on the seventh or ninth day. If, however, they survived, the disease would descend to the bowels, where a severe ulceration occurred coupled with an attack of “uncompounded” or “uniformly fluid” diarrhoea (*diarroias . . . akrotou*), which in most cases ended in death from exhaustion. Here we have a further difficulty: Page maintains²⁶ that if Thucydides employs his terminology in the strict technical sense, his present use of noun and adjective entails that dysentery is not mentioned at all in his account of the Plague and, therefore, *any disease of which dysentery is a signal characteristic should not be identified with the Plague*. He maintains that the distinction between *diarroia* and *dusenteriē* is both clearly defined and studiously observed by the doctors and adds that in the *De victu* 74, for example, *diarroia* is said to be the name given to the disorder so long as only the waste products of food pass, “but when the bowel is scraped and ulcerated and blood passes, it is called *dysentery*, a difficult and dangerous ailment”. The term *dusenteriē* in the doctors normally refers to dysenteric stools, which may be *huphaima* (suffused with blood), *cholōdea* (bilious), *muxodea* (full of mucus), *puōdea* (full of pus) or *phlegmatōdea* (full of phlegm)—anything but the waste products of food: *dusenteriē* is by nature always *akrētos*. Therefore the adjective would be utterly superfluous and is never applied to it. *Diarroia* on the contrary, may be of varying degrees of compoundedness, and the adjective *akrētos* serves to signify that particular state which is one of uniform fluidity. “Only a writer”, Page concludes, “who was grossly ignorant of the simplest distinctions of contemporary medical science could use the term *diarroia* to signify, or include, dysentery; only one to whom the medical writings were closed books, could then take the further step of attaching to *diarroia* the epithet *akrētos* which is a standard term for diarrhoea and never applied to dysentery . . . so ludicrous a blunder is not to be applied to Thucydides.”

I, for my part, find it difficult to share Page’s confidence. Notice that when the disease descends into the bowels, Thucydides explicitly asserts

that a violent ulceration ensued—an internal affliction, which presumably manifested itself in the passing of blood—how else could it for fifth century Athenians? So here we have an ulcerated bowel, and a passing of blood—symptoms of a condition, which, in view of the fact that we are told it was generally fatal, clearly falls into the category of “a difficult and dangerous ailment”! But Thucydides, notwithstanding, employs here the term *diarroia*.

At the end of Chapter 49 Thucydides recapitulates the course of the disease: it first settled in the head and thence passed throughout the whole body: if the patient survived its worst effects, it still left its mark on the extremities, for it attacked and destroyed the genitals, finger-tips and toes. Many survived with the loss of (the use of?) these, others with the loss of (the use of?) their eyes. Some rose from their beds with a total and immediate loss of memory, unable to recall their own names or to recognize their next of kin.

Before proceeding to discuss the various candidates for the identification of the Athenian Plague, we might pause to consider how brilliantly Thucydides accentuates the horror of this deadly disease by his graphic descriptions of its moral and social effects. Here again it is interesting to draw parallels with the Black Death. For example, Thucydides tells us that during the initial outbreak of the disease the people resorted to prayers in the temples, but found them futile. Eventually, the overwhelming nature of the disaster put a stop to them altogether. Men thought that it made no difference whether they worshipped the gods or not, as they saw all alike perishing. There ensued a widespread breakdown of the traditional restraints of law and morality. There is ample evidence, too, that the Black Death was followed by an immediate and sharp decline in public morality. The teachings of the established church fell into disrepute and such hysterical excesses as the flagellant movement and dancing mania (St Vitus's Dance) swept over Mediaeval Europe. Similarly, in fifth century Athens, irrational practices like that of incubation in the temple of Asclepius became widespread, and orgiastic and ecstatic cults, such as Bacchanalianism, the worship of the Phrygian “Mountain Mother”, Cybele, and that of her Thracian counterpart, Bendis and the mysteries of the Thracio-Phrygian Sabazius (a sort of savage un-Hellenized Dionysus), were enthusiastically embraced. There can be little doubt that the Plague played an influential role in creating the conditions ripe for these developments.

However, the single factor of all those recorded by Thucydides, which brings home most starkly the horrors of the Plague and its terrible destruction of established conventions in religion and morality, is his description of men tossing their dead on top of a corpse already burning upon its funeral pyre. The Greeks regarded the due observance of burial rites as a

sacred and binding duty. Only a decade before, Sophocles had written a tragedy which turned on this very point: whether Antigone was justified in following the unwritten laws of the gods in burying her brother rather than yielding to the tyrant's edict forbidding burial. Antigone is willing to die for her beliefs. Now with disposal the paramount problem, men simply tossed their dead onto another man's pyre and went off.

III

It is time now to turn to the different main candidates for the identification of the disease. Their respective claims have been canvassed with vigour, learning and ingenuity by medical men and classical scholars alike. Controversy has been spirited and erudite. Each and every case, however, shares the same underlying common denominator in that, no matter how eloquently it is pressed, there remains at least one vital factor stubbornly irreconcilable with the Thucydidean evidence.

Let us begin, in accordance with the procedure suggested at the outset, with ergotism—a non-infectious toxaemia caused by the ingestion of fungus-infected rye or other grains. The resemblance between ergotism and the Athenian Plague has been canvassed most recently by Salway and Dell,²⁷ and it must be conceded that there do exist certain similarities between the two sets of symptoms. But, these affinities notwithstanding, there seem to be conclusive arguments against this identification. In the first place, ergotism is never accompanied by a vesicular rash on the body and just such a rash is described by Thucydides. Nor was rye normally used to make bread in Classical Athens (but apparently *claviceps purpurea* can attack other grains including wheat).²⁸ Finley²⁹ suggests that rye could have been imported from Thrace to make up the deficiency caused by the Peloponnesian invasion of Attica. Other grains, however, were imported by Athens from South Russia, Egypt, and Sicily and it would, therefore, be odd that a portion of infected grains should have attacked so large a part of the population; odd, too, that all classes should have been similarly affected—the rich in the cavalry, who would be the less likely to eat rye bread, sustained similar losses to those incurred by the hoplites (III.87.3); odd, again, that the troops investing Potidaea should not themselves have been affected before the arrival of fresh troops from Athens (II.58.2); if rye bread was supplementing foodstocks at Athens, it might reasonably be assumed that this Thracian food was also being eaten by those troops investing Potidaea. Moreover, on this hypothesis it would have to be assumed that similarly affected rye was imported again in 427 BC (III.87); but not thereafter. The conjectured Ethiopian origin of the disease, too, would have to be discarded together with Thucydides's belief that it subsequently spread into Egypt, Libya, and most of the Persian Empire.

This last point is of the greatest weight, since ergotism is not an infectious disease, and Thucydides clearly considers the Athenian Plague to be infectious (II.51.5; 58.2) and describes it as spreading first from the port.

Recently attempts have been made to revive the theory that the Athenian Disease was bubonic plague.³⁰ But this candidate is as easily ruled out of court as ergotism, since there are many symptoms incompatible with Thucydides's description. An insurmountable difficulty for this identification would be the necessity to assume that Thucydides apparently either failed to observe, or did not think worth recording, that feature from which that plague takes its name—the buboes, the swelling of the lymph nodes, especially in the groin and armpits. One has only to compare, as Page points out,³¹ Procopius's description³² of bubonic plague at Constantinople in AD 542 to see the difference between his account and Thucydides's, even though Procopius copies as much from Thucydides's text as circumstances allowed. E. M. Hooker, however, has sought in her article to circumvent this difficulty by identifying the *helkē* mentioned by Thucydides with buboes.³³ But the only instance where this word is clearly equated with buboes is in Rufus of Ephesus,³⁴ who wrote in the time of Hadrian, i.e., almost six centuries later. Thucydides uses the term *helkos* to describe, not localized swellings, but a rash covering the body and, later, he uses a synonym to describe ulcerations of the bowel.

Typhus fever in its epidemic form is obviously a strong candidate, and its case has been most recently argued by Sir William MacArthur.³⁵ Many of the symptoms of typhus fever do, indeed, coincide with those described by Thucydides. The necroses of the extremities are particularly suggestive of typhus but, as Zinsser has pointed out,³⁶ this symptom is not usually prominent except in winter epidemics in armies, and the Athenian disease broke out early in the summer. Mental disorders, however, of various kinds and degrees, ranging from wild hallucinations in the earlier stages to the typical coma-vigil in the later, are highly characteristic of typhus fever. Thucydides has, apparently, nothing to say about these very striking and very common features. Again, the abdominal pains of typhus are noticeable at a much earlier stage than that described by Thucydides. In the Athenian Plague, the intestinal complaints are said to have supervened in cases where the patient survived the main crisis on the seventh or ninth day: in typhus they are of the essence of the disease, and their effect may be seen and felt at a relatively early stage. Furthermore, Thucydides describes the body as flushed and livid with an efflorescence of small blisters and sores. The typhus rash, however, appears as rose-coloured spots which blanch on pressure, become permanent and later purpuric, but never vesicular: "Blisters and sores", therefore, is hardly an apt description. Again, the typhus rash begins not in the head, but in the armpits. Blindness, too, seldom occurs in typhus; neither are vomiting, toxic diarrhoea, and

intestinal lesions a visible part of the syndrome.

The identification with measles has been canvassed—most recently as we have seen above by Shrewsbury and Page. Here, again, we have a strong candidate. Many of the symptoms mentioned by Thucydides are frequently associated with this disease by modern authorities, e.g., feverishness, inflammation and redness of the eyes, redness of tongue and throat, sneezing, hoarseness, coughing, vomiting, convulsions—in the case of children, thirst, restlessness, diarrhoea. As complications, there are mentioned ulceration and other afflictions of the intestines: there can be loss of eyesight, and the disease is highly infectious. The following Thucydidean symptoms are *occasionally* mentioned in descriptions of measles: dark purple colour of the skin during the exanthematous period, a sensation of great internal heat, general distress, mental depression and unproductive retching. But, in spite of this long list of parallel symptoms, there remain some symptoms of measles which are not easy to reconcile with the Athenian Plague—for example, abnormal and foul breath is not usually a characteristic of measles; nor is the mortification of the extremities of the body (if, indeed, this is the correct import of Thucydides's Greek). A form of gangrene of the tissues, especially of the mouth and cheeks, is well attested as a complication of measles—but there seems to be little evidence of it attacking the fingers and toes. The greatest single objection to the identification of the Athenian Plague with measles is that in the case of the former the rash is described as breaking out into small pustules and ulcers, whereas the rash of measles is a blotchy *erythema*, which becomes slightly elevated, tends to coalesce, but never becomes vesiculated. We might also raise the question why, if the Plague was measles, did that disease not become endemic in Classical Greece? There does not seem to be any reference to measles in any of the later Greek writers. And again, measles almost always confers immunity to further attack, whereas Thucydides seems to imply in his account that subsequent infections, though not fatal, were not uncommon (*cf.* II.51).

The final candidate for the identification is smallpox. Its most vigorous advocates have been Zinsser in his idiosyncratic *Rats, lice and history*,³⁷ Ebbell in a valuable but little-known study,³⁸ and the Littmans in an article published quite recently in the *Transactions of the American Philological Association*.³⁹ There does, indeed, seem to be an extremely high degree of correspondence between the Athenian Plague and smallpox—most especially in the matter of the exanthem. Thucydides, as we have seen, describes the infected body as flushed and livid with an efflorescence of blisters and sores. Here we have close conformity with the smallpox eruption which begins with a single crop of skin lesions and progresses synchronously through a macular, papular, vesicular and pustular stage.

The Littmans also point to an apparent conformity in the distribution of the rash. In describing the course of the disease, Thucydides says that it began in the head, passed down through the body and then descended to the genitals, fingers and toes, attacking these extremities. Smallpox, too, particularly attacks the extremities and is (or was) the commonest cause of blindness in India.

Thucydides adds, however, that certain victims, who recovered, were left with total amnesia which is not usually a characteristic of smallpox. But it may be noted that he does not actually say that amnesia is a characteristic of the Athenian Plague, but, rather, that it was a final complication in *some cases* after the patient had survived the first and second climax. Indeed, its comparative rarity may actually have occasioned its mention.

Other objections to this identification with smallpox have been raised by Page, namely, the absence of both physical prostration and delirium at an early stage and the lack of mention of pains in the loins and back. The Littmans seek to meet these points by contending that, although there may be prostration at an early stage in smallpox, the patient can still be fit—though disinclined to physical exertion: the degree of prostration depends on the severity of the fever; delirium generally occurs in the later stages of smallpox,⁴⁰ and many smallpox victims experience widespread, rather than highly localized, pain,⁴¹ and, while severe backache is most common in haemorrhagic smallpox, it is less severe in other forms of the disease.

However that might be, the factor that has most militated against the identification of the Plague with smallpox is the absence of any mention in Thucydides's account of the pockmarks left all over the body, and particularly on the face, after the rash of smallpox. If the disease were smallpox then Thucydides himself would have suffered this disfigurement.⁴²

The Littmans seek to defend their identification with smallpox and explain away this striking omission by reference to Thucydides's principles of historiographical composition, which, following Cochrane,⁴³ they believe to have been considerably influenced by contemporary medical science and to display marked affinities in particular with the methodology of the Hippocratic writers, who, as we have already seen above, stressed especially the importance of prognosis, the necessity to understand in advance the course the symptoms would follow. This self-same emphasis upon prognosis, the Littmans aver, can be clearly discerned in Thucydides's conception of history in general and in his particular description of the Plague. For example, in Book I.22 he announces the prognostic purpose of his History when he declares that it will be sufficient for him that his work is judged useful by those who will want to know clearly what has happened and what will someday probably happen again in the same or a similar way. In Book II.48 he says he will describe the actual course of the disease and

explain its symptoms, from the study of which a person having knowledge of the disease beforehand would not fail to recognize it should it ever break out again. Thus it is clear that Thucydides is primarily interested in *prognosis*. The pockmarks are not a *symptom* of smallpox, but rather a result of it and do not appear until some weeks after the disease has run its course. In view of Thucydides's method and purpose, argue the Littmans, his failure to mention the subsequent disfigurement resulting from the disease seems less surprizing.⁴⁴

In this way, then, the Littmans seek to explain away the omission of any mention of pockmarks upon the basis of Thucydides's historiographical methodology. However, in spite of sharing their belief that Thucydides has been influenced by contemporary medicine, I, for my part, remain unconvinced. Thucydides, as we have just seen, explicitly tells us that his aim is to provide his reader with clear knowledge of the disease so that he should not fail to recognize it, were it to attack again. Given this express declaration of intent, had the disease actually been smallpox with its striking consequent scarring, it is surely *most unlikely* that Thucydides would have omitted mention of that feature which would have enabled his reader (albeit belatedly in the case of the *initial* victims) so positively to *confirm* the identification of the disease. Even though the scarring is an epiphenomenon supervening when smallpox has run its course, this manifestation would surely have been *too important* for Thucydides, given his present purpose, simply to overlook.

Although, then, there exist striking parallels in symptoms between the Athenian Plague and smallpox, as in the case of the other attempted identifications with a disease existing in modern times, considerable difficulties do remain. Indeed, so many different identifications have been so vigorously and persuasively advocated by medical men and classical scholars alike that this fact itself suggests *a priori* that these attempts are misguided—notwithstanding Thucydides's almost clinical description of the disease. When one takes into due account the consideration which is well stressed by Zinsser⁴⁵ that during any major outbreak there is usually a coincident increase in other forms of disease (for the circumstances which favour the spread of one infectious agent often create opportunities for the transmission of others), that very rarely is there a “pure” epidemic of a single malady; that epidemic diseases inevitably become modified in the course of centuries of alternating widespread prevalence and quiescence and that symptoms can, in any case, vary considerably in accordance with diet, the conclusion, though negative, seems inescapable: modern research has been seriously misguided in its persistent attempts to identify the Great Plague of Athens with a specific modern disease.

REFERENCES

An earlier version of this paper was delivered at a meeting of the Pybus Club, University of Newcastle upon Tyne, on 12 May 1977. I should like to record here my debt to fellow members for the lively debate which ensued resulting in some change in emphasis. I should also like to express my gratitude to the Wellcome Trust for the award of a Research Fellowship, which has provided me with the leisure to pursue these, and other, researches into Greek medicine.

References to Galen are cited according to *Claudii Galeni Opera omnia*, ed. by C. G. Kühn (20 vols, Leipzig, 1821–33).

1. For this interpretation of the scholiast's comment *ad loc.* and C. Lichtenthaeler's recent article in *Hermes*, Band 107, Heft iii (1979), 270–86.
2. P. H. Birks, "Dengue in Northern Assam tea gardens", *Transactions of the Royal Society of Tropical Medicine and Hygiene*, xlvii (1952), 195–200.
3. See especially *The Peloponnesian War*, Book II.47.4 (partly quoted in Preface).
4. This is especially true of typhus and typhus-like diseases, but less so of smallpox. Rhazes's description of smallpox in the tenth century AD displays a close accord with modern accounts of the disease. See *A treatise on the smallpox and measles by Abu Bacr Mohammed ibn Zacariya al Razi (commonly called Rhazes)*, translated by W. A. Greenhill (London, 1948).
5. *The Peloponnesian War*, Book III.87, where Thucydides informs us that during this second outbreak of the Plague 4,400 hoplites (out of c. 13,000) and 300 cavalry (out of c. 1,000) were stricken by the disease and died. Since in any epidemic higher losses are almost invariably sustained among the very young, the very old, the poor and the sick, than among the richer and able-bodied, it is tempting to suppose that the proportion of the dead was even higher than this—but caution must be enjoined: see II.51.3 where we are told that strong and weak constitutions proved equally incapable of resistance. On the above figures see A. W. Gomme, *A historical commentary on Thucydides* (Oxford, 1956), vol. ii, note *ad loc.*
6. On literary accounts of plague in general, see R. Crawford, *Plague and pestilence in literature and art* (Oxford, 1914), and Jürgen Grimm, *Die literarische Darstellung der Pest in der Antike und in der Romania* (Munich, 1965).
7. For example, see J. F. D. Shrewsbury, "The Plague of Athens", *Bulletin of the history of medicine*, xxiv (1950), 1–25, p. 5. Galen, it may be noted, regards Thucydides as a layman (*idiotas*) who wrote for laymen (*idiotais*). See *De difficultate respirationis*, II.7 (vii, 854K.), cited by F. Kudlien in "Galens Urteil über die Thukydeische Pestbeschreibung", *Episteme*, v (1971), 132–3.
8. D. L. Page, "Thucydides' description of the Great Plague at Athens", *Classical quarterly*, n.s., iii (1953), 97–119.
9. For example, see A. W. Gomme, *op. cit.* (ref. 5), 150; C. Lichtenthaeler, *Thucydide et Hippocrate vus par un historien médecin* (Geneva, 1965), 33; and John Scarborough, "Thucydides, Greek medicine, and the Plague at Athens", *Episteme*, iv (1970), 77–90, p. 80. The position is stated most emphatically by Lichtenthaeler, who maintains "il est donc établi comme une certitude que l'Historien athénien a écrit la peste à l'aide de la terminologie scientifique contemporaine".
10. A. Parry, "The language of Thucydides' description of the Plague", *Bulletin of the Institute of Classical Studies*, xvi (1969), 106–18, pp. 112ff.
11. See for example the beginning of *Prognosticon*: "I now consider it an excellent thing for a physician to practise forecasting. For, if he foreknows and foretells at the sick-bed the present, the past and the future, and describes in detail what the sick have omitted to mention, he will create confidence that he understands what is

the matter with his patients, so that they will then have the courage to entrust themselves to him for treatment. *Moreover he will best carry out the treatment if he has the ability to foretell what will occur from the present symptoms.*" See, too, *Epidemics*, I.xi.

12. See "A semantic study of PROPHASIS to 400 BC", *Hermes*, Einzelschriften Heft xxxiii (1975). See especially ch. iii, 51–60, and ch. iv, 76–81.
13. See, too, J. De Romilly, *Thucydide* (Budé edition, Paris, 1962), bk ii, pp. xxx & xxxi.
14. See W. Jaeger, "Aristotle's use of medicine as a model of method in his *Ethics*", *Journal of Hellenic studies*, lxxvii (1957), 54–61.
15. See my article, "Philosophy and medicine: Some early interactions", in *Harvard studies in classical philology*, lxvii (1963), 147–75, pp. 158f.
16. For these parallels see the above article (pp. 162f.) and L. Versényi, *Socratic humanism* (New Haven, 1963), 33–35, 43. Versényi maintains that *Ancient medicine* was influenced by Protagoras; but its conclusions arise directly and naturally from preoccupations with medical practice (so too W. K. C. Guthrie, *A history of Greek philosophy*, iii (Cambridge, 1969), 169, n. 1). Guthrie's standpoint seems unnecessarily cumbersome: i.e., he accepts that there are close parallels between *Ancient medicine* and the sophist; he rejects Versényi's thesis that the medical work is influenced by the sophist and believes it "beyond doubt" that Protagoras was influenced by contemporary medicine. Given the uncertainty of the date of *Ancient medicine*, it is surely arbitrary to postulate the (lost) common source which is implicitly entailed by Guthrie's hypothesis—the similarities in thought and wording are much too close to have resulted from a more general influence hypothesized by Guthrie.
17. See too Hippolytus, *Refutatio omnium haeresium*, ix, 9 (DK22B56); Aristophanes, *Plutus*, 537; Plato, *Sophist*, 227B, and, generally, H. Keil, "The louse in Greek antiquity, with comments on the diagnosis of the Athenian Plague as recorded by Thucydides", *Bulletin of the history of medicine*, xxv (1951), 305–23.
18. *Op. cit.* (ref. 7), 10.
19. It has been maintained by some that the rat was not present in Europe before the twelfth century when it was imported by the Crusaders on their way home. But see W. P. MacArthur, "The occurrence of the rat in early Europe", *Transactions of the Royal Society of Tropical Medicine and Hygiene*, xlvi (1952), 209–12.
20. See for example E. W. Williams, "The sickness at Athens", *Greece and Rome*, xxvi (1957), 98–103, who points especially to Thucydides's description of the death of birds and animals which he sees as a striking feature of bubonic plague.
21. C. N. Cochrane, *Thucydides and the science of history* (London, 1929), 27, followed by Page, *op. cit.* (ref. 8), 98, overpresses the evidence in seeing here what the Hippocratics called the *katastasis*—the general conditions prevailing at the outbreak of a disease. See Parry, *op. cit.* (ref. 10), 106, who quotes the first *katastasis* of *Epidemics* I. The second *katastasis* is even more detailed and is cited below, *exempli gratia*:

In Thasos early in autumn occurred unseasonably wintry storms, suddenly, with many north and south winds bursting out into rains. These conditions continued until the setting of the Pleiades and during their season. Winter was northerly; many violent and abundant rains; snows; generally there were fine intervals. With all this, however, the cold weather was not exceptionally unseasonable. But immediately after the winter solstice, when the west wind usually begins to blow, there was a return of severe wintry weather, much north wind, snow and copious rains continuously, sky stormy and clouded. These conditions lasted on, and did not remit before the equinox.

Spring cold, northerly, wet, cloudy. Summer did not turn out excessively hot, the Etesian winds blowing continuously. But soon after, near the rising of Arcturus, there was much rain again, with northerly winds.

The whole year having been wet, cold and northerly, in the winter the public health in most respects was good, but in early spring many, in fact, most suffered illnesses . . . (W. H. S. Jones's translation in *Hippocrates*, Loeb, vol. i (London and Cambridge, Mass., 1957), 153-5).

Thucydides, by contrast, begins his account of the Plague (II.49) as follows:

Of all years, it was agreed, this one was especially free from sickness of every other kind. Such few cases as occurred, all were resolved into this. Other people in good health were suddenly attacked, from no ostensible cause, first by violent fevers in the head and redness and inflammation in the eyes. . . .

22. According to Galen (*De Hippocratis et Platonis placitis*, II.8 (v, 275K.)), *kardia* in this context carries the recondite meaning of "cardiac orifice of the stomach"; but the more usual and, indeed, commonplace meaning makes perfectly good sense and is preferable to Galen's erudite conjecture (with Page, *op. cit.* (ref. 8), 100). See I. M. Lonie's discussion of *kardia* in his forthcoming edition, translation, and commentary on *The seed and The nature of the child* (*Diseases IV*), in the series *Ars medica* (de Gruyter, Berlin).
23. The word *phluktainai* with its synonyms *phluktis*, *phluktainis*, *phluktainidion*, is the standard term for an exanthem of the blister type. Its usual meaning is a raised blister such as caused by rowing (see Aristophanes, *Frogs*, 236-8); or that caused by fire (see Theophrastus, *De igne*, 57, and also 39 where he uses its counterpart *phluktides*). In *Ancient medicine*, 16.35 *phluktainai* caused by frostbite are noted as "like those caused by burning in fire" (see too *Epidemics*, 2.1.1). *Helkos* is a term of general reference most commonly used to denote a lesion in the soft parts of the body (see Galen's definition in *De methodo medendi*, 4; x, 232K.), and the word is clearly employed here by Thucydides in this general sense of sore or lesion.
24. *Op. cit.* (ref. 7), 16ff.
25. *Op. cit.* (ref. 8), 117f.
26. *Ibid.*, 102f.
27. P. Salway and W. Dell, "Plague at Athens", *Greece and Rome*, xxiv (1955), 62-70.
28. See G. Barger, *Ergot and ergotism* (London, 1931), 112ff., and C. Creighton, *A history of epidemics in Britain* (second ed., London, 1965), 58.
29. J. H. Finley, *Thucydides* (Cambridge, Mass., 1942), 158, n. 2.
30. See E. W. Williams, "The sickness at Athens", *Greece and Rome*, xxvi (1957), 98-103, and E. M. Hooker, "Buboes in Thucydides?", *Journal of Hellenic studies*, lxxviii (1958), 78-83.
31. *Op. cit.* (ref. 8), 115.
32. *Persica*, 2.22.
33. *Op. cit.* (ref. 30), 78ff.
34. *Apud Oribasium*, 44.18.
35. W. P. MacArthur, "The Athenian Plague: A medical note", *Classical quarterly*, n.s., iv (1954), 171-4. Lichenthaeler (*op. cit.* (ref. 9), 23 and 37) and Scarborough (*op. cit.* (ref. 9), 90) are persuaded by MacArthur's arguments, as is S. L. Radt, "Zu Thukydidens' Pestbeschreibung", *Mnemosyne*, xxxi (1978), 233-45, pp. 240ff. MacArthur in support of this identification has argued that "violent convulsions' (whatever their cause) cannot occur if the brain is normal". But his translation seriously begs the question. It is a perverse form of arrogance on the

technical sense of "convulsion", then to maintain that "Thucydides is, of course, wrong in supposing that *spasmos ischuros* was induced by the retching". MacArthur fathers his own interpretation upon Thucydides, and then criticizes him for making a mistake. Of course, Thucydides is not claiming that the retching caused severe convulsions, but rather that it produced violent muscular spasms—which is a perfectly acceptable interpretation of the Greek. See for example (Hippocrates), *De morbis*, I.22 for a usage which makes good sense of the whole context and removes the need to assume that Thucydides is in error here.

36. H. Zinsser, *Rats, lice and history* (Boston, 1942), 123.
37. *Op. cit.* (ref. 36), 122, 124.
38. See B. Ebbell, "Beiträge zur ältesten Geschichte einiger Infektionskrankheiten", *Skrifter utgitt av det Norske Videnskapakademi, Oslo, n.s.*, ii (1967: but written 1941), 39–52.
39. See R. J. and M. L. Littman, "The Athenian Plague: Smallpox", *Transactions of the American Philological Association*, c (1969), 261–75.
40. See T. F. Ricketts and J. B. Byles, *The diagnosis of smallpox* (London, 1908), 39.
41. *Ibid.*, 59.
42. A German scholar, B. von Hagen, with impressive, but misplaced Teutonic zeal, in an attempt to confirm the identification with smallpox, travelled to Italy to scrutinize the Naples bust of Thucydides for pockmarks! Alas, he records it gave no clue—it "gab keinen Anhaltspunkt": cf. "Die sogenannte Pest des Thucydides", *Gymnasium*, xlix (1938), 120–31, p. 127 n. 3.
43. C. N. Cochrane, *Thucydides and the science of history* (London, 1929); K. Weidauer, *Thukydides und die hippokratischen Schriften* (Heidelberg, 1954), arrives at a similar conclusion.
44. In support of their standpoint the Littmans points out that in the account of smallpox in C. E. van Rooyen and A. J. Rhodes, *Virus diseases of man* (New York, 1948), 286–98, there is no mention at all of the characteristic pockmarks. An ancient parallel might have been more appropriate: the plague that ravaged Rome in AD 153–168 was almost certainly smallpox, yet Galen in his description of it makes no mention of the scarring. Cf. *De methodo medendi*, 5.12 (x, 360K.).
45. *Op. cit.* (ref. 36), 120.