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THE BLACK DEATH AND THE FUTURE OF MEDICINE

by

SARAH FRANCES VANNESTE

THESIS

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Introduction

The Black Death of the fourteenth century swept across Europe causing widespread and crippling mortality in numerous societies. It stands out as one of the most startling and appalling instances of misery and hopelessness in the face of an unseen and unfathomable enemy, taking a heavy toll on the populations it struck. European areas had not experienced a pandemic on the level of the Black Death in over five hundred years and this re-visitation of the plague in the fourteenth century was viewed as completely unprecedented. Therefore, European areas had no real and remembered precedent to which they could turn for guidance, stability, and aid and had few effective measures with which to mitigate this disaster. Traditional edifices, such as the Church, the ruler, and medicine seemed to fail in the face of the Black Death, and people were largely left to their own devices in coping with the devastation. Contemporaries of the Black Death describe the events and consequences of it with horror and dismay, many leaving the reader with a sense that the world itself was collapsing. Agnolo di Tura, a chronicler of the Black Death in Siena, exemplified such sentiments in his writing. "There was no one who wept for any death, for all awaited death. And so many died that all believed that it was the end of the world."[1]

Most scholars agree that the Black Death had immediate catastrophic implications for life in Europe. Daily life largely ground to a halt, and individuals often cracked under the pressures of the sheer number of people affected, such that "Father abandoned child, wife husband, one brother another; for this illness seemed to strike through the breath and sight. And so they died. And none could be found to bury the dead for money or friendship."[2] Additionally, Boccaccio described in *The Decameron,* that "Many died nightly in the public streets; of many others, who died at home, the departure was hardly observed by their neighbors, until the stench of their

putrefying bodies carried the tidings; and what with their corpses and the corpses of others who died on every hand the whole place was a sepulchre."[3] Thus, though historians have varied in their estimates of death tolls in different areas and amongst different segments of populations, they have agreed that the Black Death was truly a terrifying and enormously disruptive event across Europe. Yet, scholars still debate the long-term effects of the Black Death, and various positions regarding the legacy of the Black Death can be found throughout the literature on the subject. The positions of scholars range from contending that the Black Death was a formative event in the history of Europe, bringing down the medieval period and ushering in the modern one, to arguing that the Black Death, though a disaster at the time, had less significant long-term effects, with European areas rebounding rather quickly and the Black Death being only one factor among many that shaped Europe's progression from the medieval to the modern, with many degrees of difference in between. These debates have involved numerous aspects of European life, including state functions, religion, economies, art, intellectual life, psychological effects, medicine, and others. The Black Death's significance for the populations of Europe that it visited is thus an important topic of investigation for modern scholars, as they attempt to determine as precisely as possible its significance for these populations themselves.

This paper will specifically focus on the effects of the Black Death on medicine and medical practice in Europe. Its purpose is to investigate the Black Death's influence on medicine, especially with regard to learned medicine and surgery. In order to do this, the paper will first review existing scholarship on this subject. Works dealing specifically with the subject of the Black Death's effect upon European medicine are small in number, yet the subject can be approached by various avenues. Though not generally treated directly, scholarly opinions on the effect of the Black Death on medicine may be embedded in works more specifically focused on

other topics, such as the development of medicine in general, the development of medieval universities, and the Black Death itself. Therefore, this paper will also examine several works on medieval universities and the medical education received within them, the development of medicine within Europe, and the Black Death in general.

After reviewing the scholarship, this paper will then investigate several primary sources regarding medicine before, during and after the Black Death. These works include records of the texts used at universities in the medical education of physicians, especially at the University of Paris for which such records are extant, medical treatises themselves, and descriptions of contemporaries regarding medical practices of the times surrounding the Black Death. These texts reveal contemporary attitudes toward medicine and physicians and surgeons as well as the sometimes complicated and shifting relationship between the practices of medicine and surgery. It has often been contended that the later middle ages saw a growing division between what may be called internal medicine and surgery, as learned physicians sought to solidify their prestigious status and codify their division from the surgeons whom they viewed more as craftsmen than as learned medical practitioners. Yet, not only was this division often blurred, with surgery being part of the medical education received at several universities, mostly in southern Europe, and with several works written by prominent physicians including instructions on surgery; but the failure of much of learned medical practices in effectively combating the Black Death may have led to a greater focus on surgeons as men of practical learning who could produce more effective results than could learned physicians more focused on theoretical disease prevention and causation and on textual criticisms of ancient works on medicine. Indeed, in the decades after the Black Death, surgeons increasingly sought to increase their prestige and to distinguish themselves as men of both theory and practice from more craftsmen-like barber surgeons with

little or no formal medical training.

It will be argued in this paper that the Black Death caused something of a crisis in medicine. As traditional methods failed across Europe, medical practitioners scrambled to both explain the origins of the plague and develop ways to prevent and cure it. Theoretical medicine provided several explanations of causation, but few effective remedies short of flight and basic hygiene. The discussion about which was more important, theory or experience, had been going on for a long time prior to the Black Death, with theory generally winning out, at least in the universities. Following this disaster of plague, people looked to more practical medicine, based less in abstract theory and more in experience. Moreover, the struggle between physician and surgeon became more pronounced and in earnest, especially as plague outbreaks continued to occur periodically in various localities. The Black Death thus accelerated a shift in medicine toward its more practical elements as exemplified by the intensification of the debate on surgery.

Chapter 1: Historiography

Histories of the Black Death

Within the scholarship, many early works on the Black Death in general and on medicine in specific cite the Black Death as a major turning point both in European history and in the history of medicine. For these authors, the Black Death was a formative event, altering the course of several aspects of medieval life and signaling the coming of early modern European societies. One such author, J. F. C. Hecker, described the Black Death as "one of the most important events which have prepared the way for the present state of Europe."[4] Additionally, another historian, Cardinal Francis Aiden Gasquet, found the Black Death to be enormously significant, representing a complete break with the past and the beginning of a new era. He wrote that the Black Death was "the real close of the medieval period and the beginning of the modern age."[5] Not all early works on the plague agree that it marked the dividing line between medieval and modern, and some argue that its long-term effects had been somewhat exaggerated. Nevertheless, the general tone of works on plague during the late nineteenth and early twentieth centuries is that the Black Death of 1348 was an extraordinary event with long range consequences for life in Europe that no other event to that point could match.

With regard specifically to the Black Death's effect on medicine, Anna Campbell's work *The Black Death and Men of Learning* has been one of only a few that treat the subject directly, though her work also discusses both general and specifically medical education in universities. Campbell argues that the Black Death significantly and negatively effected education across Europe, chiefly by killing off, or causing to flee, many of the current masters of the time, and reducing the amount and quality of both Latin as a language skill and higher education. Campbell asserts that the Black Death precipitated a decline in higher education based on several

statements of contemporary observers which lament the degraded state of education in the decades after the Black Death.[6] She states, "In going through sources bearing on universities and education in general from 1347 to about 1375, it is plain that the Black Death and immediately succeeding outbreaks of pestilence had decided and dire consequences in these fields."[7] She maintains that the Black Death decreased the knowledge and use of Latin, eroding the quality of primary education in the language as fewer able teachers were to be found, and increased the use of vernacular languages, most notably, in medical tracts on the plague itself. This was the most notable and specific change in medicine that she discussed in her work. The Black Death initiated a flurry of writings on the plague by various medical authors, and many of them were written in vernacular languages as opposed to Latin, the previously standard language for almost all learned writings on medicine and surgery. She states, "The use of vernacular languages for scientific works receives impetus from the Black Death and continues increasingly through the fourteenth century."[8] Though the overall sense of her findings is that the Black Death affected learning, including medical learning, she does contend that the sheer volume of writings on plague that the Black Death and its recurrences inspired "helped to introduce something of the scientific spirit in so far as they were supported by the observations and experience of the advocates."[9] The various plague tract authors disagreed with each other and argued for their own advice by describing their own observations. This increased reliance on observation, as opposed to theoretical knowledge passed down from classical authors, is, Campbell argues, a legacy of the Black Death.

Some more recent works also present a similar interpretation of the Black Death's effect on medicine in Europe. Robert Gottfried argued in his work, *The Black Death: Natural and Human Disaster in Medieval Europe,* that the Black Death led to sweeping changes in the course

of medical practice, ultimately leading to the beginnings of modern medicine. He contends that the onset of the plague cycle in Europe and the devastation it caused to human populations led to dissatisfaction with the previous medical practices, specifically of learned physicians, and to increased reliance on surgeons as well as a change in the roles of hospitals and in sanitation. He wrote,

> These developments – the rise of surgery, the transformation of the role of hospitals, the rise in standards of public health, and the development of deontology – were all part of the professionalization of medicine and crucial to all was the recurrence of the plague. By the early sixteenth century, medicine had become a detailed, complex corpus of knowledge and skills which at its most arcane and successful levels could be understood only after long, intensive and specialized studies. Modern medicine had not yet evolved completely. A major step remained – the triumph of physical science in medical research. This process, which began in the sixteenth century with Paracelsus and Vesalius, was part and parcel of the scientific revolution and the rise of chemistry and physics in the seventeenth century, and was not completed until the eighteenth century. But its foundations were laid in the 150 years after the Black Death.[10]

Gottfried's work echoes that of Campbell in arguing that the Black Death was the causative agent in several shifts in medicine occurring after its incidence. Like other authors on the Black Death in general, he viewed the recurrences as having a great impact on the course of Europe after the Black Death, yet, far from viewing them as hindrances to European development, at least with regards to medicine, he argues that the problems they caused were ultimately a positive influence on medical practices, pushing change in an area that, he maintained, had remained stagnant for generations and was locked into the traditions of ancient authors and their medieval commentators.

David Herlihy argues along similar lines in his work *The Black Death and the Transformation of the West.* Like Gottfried, Herlihy argues that the Black Death destroyed people's confidence in traditional medical theories and physicians' confidence that ancient authors of medical works had covered everything they needed to know.[11] Herlihy contends that

the Black Death prompted new emphasis on theories involving contagion, which were not present in ancient works. Strategies such as the quarantining of incoming ships, according to Herlihy, grew out of these new ideas. Additionally, Herlihy asserts that the post-Black Death period saw a breaking down in divisions between physicians and surgeons, the elevation of surgery's prestige, and a redoubled effort to study human anatomy through dissections of cadavers, not unheard of before the Black Death, but more commonly done thereafter. In essence, Herlihy argues that the Black Death led to a slowly evolving reassessment of previously held traditions in medicine, especially of Galenic tradition, and that this placed medicine firmly on the road to modern development.[12]

Few historians seem to have been as enthusiastic as Gottfried or Herlihy in their assessments of the Black Death's influence on modern medicine. For example, William McNeill, in his work *Plagues and Peoples*, is willing to assert that the Black Death did give rise to certain future developments in Europe, such as the Reformation, of which he argues the Black Death provided one contributing element due to its influence on religious sentiments.[13] He also argues that the Black Death set the stage for future developments in the area of governance, explaining that the Black Death provided secular authorities with a unique opportunity to extend their power over local affairs. He maintains that there was sort of a secularization of cultural values in the time after the Black Death and that the Black Death itself was one of the important factors in this shift.[14] However, with regard to medicine, McNeill does not attribute much influence to the Black Death, leaving the roots of modern medicine planted firmly in the scientific revolution of the eighteenth century. Thus, while McNeill allows the Black Death a place of importance among the major developments in European history, and credits it with some

influence over the developments that occurred in Europe after it struck, he does not trace any important change in medical practice to that period.

Within more recent scholarship, the various debates on the Black Death have intensified, with work increasingly being done on theories and ideas that diverge more and more from the traditional explanations and evaluations of the Black Death of earlier generations. There are many ongoing debates among historians regarding almost every possible aspect of the Black Death, but one example most pertinent to this discussion is the article "The Black Death: End of a Paradigm" by Samuel K. Cohn Jr. Cohn's argument is twofold: first, he argues that the disease or diseases that caused the Black Death was not rat-based bubonic plague, and second, more importantly, that the cultural and societal aftershocks of the Black Death were not overwhelmingly negative. He asserts that previous scholarship has painted a picture of post-Black Death Europe as a place fraught with increased violence, depression, collapse, and general pessimism, but that this was not, in fact, the case. In order to make this argument, he focuses on the trajectory of medicine after the Black Death as one of the ways in which the errors of previous scholars can be illuminated. He agrees that the initial response of almost all contemporary accounts of the Black Death was indeed burdened with desperation, shock, and depression, but contends that this did not last, and states that "subsequent plagues of the fourteenth and early fifteenth centuries failed to set off those wild and unsanctioned displays of emotion – the flagellant movements – that had frightened churchmen and secular authorities in 1349 and 1350."[15] With regard to medicine, Cohn asserts that the Black Death precipitated an immediate crisis in medicine, but that this quickly gave way to a new spirit of confidence and primacy of place being given to personal observation over elaborate theories, as evidenced by the enormous volume of plague tractates, a new genre of writing, according to Cohn, which

appeared in the years after the Black Death.[16] Additionally, Cohn asserts that, after the Black Death, doctors soon began abandoning their previous focus on theories of causation, generally rooted in astronomy and religion, and focused instead on practical measures to cure the sick.[17] He writes, "From skepticism about remedies, cures, and preventive measures, doctors and chroniclers increasingly supplied solutions."[18] According to Cohn, this change in medicine was not only evidence that the initial desperation inspired by the Black Death was short lived, but that the Black Death was an important step for medical progress. Regarding this, he wrote,

> From the unknowable, even the unspeakable, plague was now seen as beneficial to medical progress: it had given post-Black Death doctors a new range of practical experience. …Far from being slavish followers of ancient or later Arabic authorities, as historians often assert, doctors of the late fourteenth and early fifteenth century plagues were now often disdainful of these authorities, Hippocrates and Galen included. The new plague doctors relied on their own "experience" in place of the "auctores" in curing plague patients.[19]

Though Cohn's arguments disagree with those of Gottfried in several important ways, their assertions about the Black Death's affect on medical practice in Europe are rather similar. Both claim that the Black Death dealt a hard blow to traditional medical learning and paved the way for more observation-based, "clinical" medicine and surgery, though Gottfried has more detailed information on the positions of surgeons as a class, while Cohn treats doctors as a general category, which they certainly were not. Thus, though their conclusions about what post-Black Death Europe looked like are quite at odds, and, although they argue the Black Death had radically different implications on life, the two historians see similar changes in medicine resulting from the Black Death.

Histories of Medical Education and Medicine

In a different vein of scholarship, historians focusing on the history of medicine, and concurrently, on the history of university education, implicitly downplay the Black Death as a

pivotal event in history. Most works devoted to education or medicine trace the development of one or another specific medieval university or of medicine in general over a span of centuries, and in them, the Black Death is simply one event, which the historian may or may not regard as important. Anna Campbell's work remains one of the few to assign the Black Death primacy of place in shaping education and medicine as the focus of her work *The Black Death and Men of Learning.* Few similar works exist on the same scale, though some material has been written on the relationship of the Black Death to elementary and secondary education.

One such work, written half a century after Campbell's work, is "The Effect of the Black Death on English Higher Education" by William J. Courtenay. Courtenay's article is not specifically about medicine and the Black Death, but focuses on education in general in England. In it, Courtenay counters some of Campbell's conclusions about the Black Death's effect on education. He concludes that the Black Death did not significantly reduce the number of students studying at Oxford in the decades after the Black Death and that, if the Black Death seriously affected university education at Oxford, it did so by "impairing the quality of primary education, and only subsequently higher education."[20] According to Courtenay, the Black Death did not significantly reduce the amount or the quality of Latin read and written in at the university level, however, he does state that good Latin grammarians may have been hard to come by at the local level in many areas for a period of time after the Black Death and that primary Latin education was bound to suffer. Yet, he argues that the changes in education that he finds at Oxford, in the area of theology, correspond to changes in theological interests, shifting toward the more practical and less esoteric, and changes in job prospects for graduates.[21] Thus, though he cites shifts in university education, he attributes them primarily to other developments beyond loss of linguistic skills, and though he counters Campbell's findings, he

does not deal specifically with medicine.

The writings of Vern Bullough focus specifically on the development of medicine and medical education at the university level. Bullough has written many works on various universities and on medicine in general. In his work *The Development of Medicine as a Profession: The Contribution of the Medieval University to Modern Medicine,* Bullough follows the development of medicine from ancient times through the mid fifteenth century. He does not mention the Black Death at all in this work; however, he argues that medicine was becoming professionalized in the later fourteenth and early fifteenth centuries through its institutionalization within medical universities. Furthermore, he argues that, as part of this institutionalization, there was a growing rift between university-educated physicians and more empirically oriented surgeons.[22] Thus, though not specifically citing the Black Death and its recurrences as important to medicine, Bullough identifies the period in which these plague visitations occurred as pivotal to medicine's development. It is interesting that he passes over the plague as a factor and does not attempt to link surgeons' efforts to elevate their work and physicians' efforts to gain control over other medical practitioners with the plague since these efforts seem to have gained impetus during the decades after the Black Death. Bullough treats the gulf between physicians and surgeons as retarding medical progress, yet also argues that it was a necessary element in the process of medicine's professionalization. Further investigation on the relationship between the Black Death and the efforts of physicians and surgeons to secure and define their positions and roles within society would perhaps be a beneficial addition to scholarship.

In another work, "Status and Medieval Medicine," Bullough again investigates the formation of divisions between what he terms the "speculative practitioner, the physician, and

the manual one, the surgeon."[23] Here, Bullough asserts again that the institutionalization of medicine within universities and the desire of physicians to secure prestige helped lead to the separation of medicine and surgery that he sees in the later medieval period, the time after the Black Death. Additionally, Bullough describes the great age of university medical schools as being the thirteenth century and asserts that after that, they began to decline. He cites several factors for their decline, among them political, social, and religious unrest, and inertia caused by the plague. Yet, he argues that the most important factor was the division within medicine and the conflicts this initiated (citing factors aside from plague in explaining this division).[24] Bullough explains that, earlier in the medieval period, medicine and surgery had not been nearly as separated as they became later, though they remained rather unified in Italian schools, and he admits that his theory breaks down when applied to Italian areas.[25] His focus, however, remains the growing separation of medicine and surgery in the later fourteenth century, and he mentions plague only as a factor in hindering universities and not actually as a factor in producing medical factions. For Bullough, the Black Death does not appear as a decisive event for medicine; it is merely an incident external to medicine's development, perhaps affecting universities, but left out of the narrative of medicine's overall progress.

In other writings, Bullough details the development of medical learning at individual universities in the medieval period, namely Paris, Montpellier, Bologna, and Oxford.[26] Such works are useful descriptions of each of these medical centers' development and give insight into the similarities and differences in medical learning and influence on medicine in general among the various universities. However, these articles are concerned with the institutions themselves and not much with the environments in which they all existed. Hence, the Black Death, again, is little dealt with, except when it caused a temporary cessation in studies. In much the same vein

are other works investigating the development of institutions and of medicine as a whole.

Among historians of education and medical history, Bullough is by no means alone in making scant reference to the Black Death or subsequent outbreaks of plague. Hastings Rashdall, in his still widely cited 1936 foundational work, *Universities of Europe in the Middle Ages*, scarcely discusses plague at all.[27] Rashdall does provide descriptions of the medieval universities of Europe, their structures, development, and intellectual life, as well as a description of student life within them across Europe. However, the plague is generally mentioned only as it caused university closures or provided the impetus for the foundations of new colleges in certain areas, especially at Oxford and Cambridge, where benefactors may have hoped to replenish the stock of qualified clergy after the Black Death.[28] Thus, Rashdall takes a limited view of the Black Death's influence on education.

Gordon Leff, in his work *Paris and Oxford Universities in the Thirteenth and Fourteenth Centuries: An Institutional and Intellectual History*, mentions only that the Black Death "carried off many of the previous generation, or they disappeared from the scene at this time. Little is yet known about the years which followed."[29] Additionally, this reference is made chiefly concerning theological scholars, despite the presence at Oxford and especially at Paris of vibrant medical schools. In her work on the university at Padua, *Arts and Sciences at Padua: The Studium of Padua Before 1350*, Nancy Siraisi does not mention any effects of plague on the institution, which was originally known for its legal studies but soon developed a renowned medical school as well.[30] Furthermore, in a general work on medieval universities, A. B. Cobban recounts that successive outbreaks of plague did indeed cause several closures of universities due to temporary flight, but also details several stoppages caused by other factors, such as civil disorders and conflicts with authorities, particularly in Italian areas. Cobban argues that frequent

stoppages hindered academic progress, but he does not say anything further on the effects of plague on university life.[31]

C. H. Talbot, in his work *Medicine in Medieval England,* discusses the development of medical practices in England from early Anglo-Saxon times through about the fifteenth century. In discussing the Black Death, Talbot contends that, "The social and economic consequences of this terrible visitation were sudden and revolutionary."[32] Like many general historians of the Black Death, Talbot argues that the plague had immediate and catastrophic effects throughout Europe, negatively hindering art, education, and building construction. With regard to the Black Death's effect on medical practice, however, Talbot remarks that only here did the Black Death initiate change in a positive direction. He writes,

> Only in one respect did the plague bring about beneficial results, making the general public aware of the danger of the unsanitary conditions that had previously prevailed. From this time forward we find not only a growing agitation among citizens against the pollution of the streets and water courses, but also an increasing number of publications, both private and public, drawing attention to the way in which contagion of any kind could be avoided.[33]

The plague's help in changing attitudes on sanitation is not only the sole positive effect that Talbot finds in the Black Death, but also the sole effect on medicine at all that he finds precipitated by it. He goes on to argue that, other than highlighting sanitation issues, the Black Death did not change medical practice substantially, as, he contends, during subsequent outbreaks of plague in England in the fifteenth century, "ideas about combating it had not changed or made progress."[34] Thus, for Talbot, the Black Death altered the customary views on sanitation, but did little to alter traditional medical ideas. He asserts that the later fourteenth century saw a period of stagnation in medicine, where authors of medical treatises borrowed not only from ancient sources, but now also from "compilations on secondary sources," and

generally speaking, medicine was not making any new progress.[35]

Interestingly, however, Talbot later argues that medicine was undergoing important changes at the end of the fourteenth century and into the fifteenth, so his writing is not completely consistent with his earlier arguments that this period was one of stagnation. He locates an important shift toward the rising prominence and new respectability for skilled surgeons. He places this shift as beginning around the middle of the fifteenth century and argues that physicians began to change in their attitudes toward surgeons. Though physicians had previously treated surgeons with evident disdain, Talbot argues, they began to take new interest in surgery, though they may not have proceeded to practice it on a regular basis.[36] This is an important shift, and is consistent with the ideas expressed in other histories of the Black Death. However, Talbot argues that this shift toward new respect and status for surgeons was the result not of the Black Death and a failure of physicians to treat it in any successful way, but of the Hundred Years War, especially from 1415 onwards, when there was great demand for skilled surgeons to attend the wounded in battle. On the battlefield, physicians are practically useless, but the importance of surgeons increased enormously. Thus, though surgery may not yet have attained a place of prominence at all universities, it was becoming increasingly important to, and prestigious with, rulers of Europe engaged in warfare.[37]

In sum, it is evident, then, that sources do not all agree on the issue of the Black Death's effects upon medieval medicine. A wide variety of opinions and theories regarding the Black Death and medicine are found among the various secondary sources available. Scholars present potential students with a range of interpretations of the Black Death's effects on European life and medicine. In general, however, there seems to be an especially acute split between the ideas regarding medicine found in works written on the Black Death specifically, which tend to

attempt to cover in one great sweep all of the effects that the Black Death had across Europe, and those written on the history of medieval education or medical education, which do not focus specifically on the Black Death but instead trace education through history. The general works on the Black Death tend to argue that the Black Death was crucial to the development of medicine, while those on education are not nearly so enthusiastic, with the Black Death sometimes being left out of the narrative altogether. Additionally, these two categories of sources tend to present different views on the status of medieval medicine before the Black Death as well. Historians, such as Herlihy, often contend that physicians and surgeons were deeply divided before the plague and that medical progress was stagnant. For them, the Black Death infused medicine with new vitality. Scholars writing on medieval medicine and medical education, such as Bullough, however, take almost the exact opposite stance, arguing that, prior to the latter fourteenth century, the division between physicians and surgeons was less pronounced and medicine exhibited vibrancy, especially during the thirteenth century. For them, the latter fourteenth century saw increasing division and fracturing within the medical community, often with what they argue were negative results for medicine. For the first group of scholars, the Black Death represents a positive for medicine. For the second group, the period around the Black Death represents something of a period of setback, even if some argue that this was simultaneously the period in which medicine was professionalized.

It is surprising that there is such division in interpretation of source material between these two categories of sources. Though it is unlikely that such a long-standing division will be reconciled immediately, further investigation on the effect of the Black Death upon medieval medicine may prove helpful. The fact that few historians of education have directly treated the matter may account somewhat for the lack of discussion on it in many of their works. It is very

probable that the Black Death had some effects on medical practices, since it had immediate effects on so many aspects of life; yet the nature of these effects, their longevity, and their ultimate ramifications for the developing medical professions, still deserve further investigation and discussion among scholars. The remainder of this work will seek to investigate the effects of the Black Death on medieval medicine and assess how the plague changed medical practice and influenced its development in the decades that were to follow.

Chapter 2: Pre-Plague Medical Education and Practices

In order to better illuminate any changes that occurred in medical practice after the onset of the Black Death, one must first examine the state of medical practice at the time of the Black Death. By the fourteenth century, medical practitioners had been stratified into more or less five groups, though there was certainly overlap among them depending particularly upon the area in Europe in question.[38] According to Loren C. MacKinney, these groups basically followed the same division of medical practitioners laid out in Aristotilian thought in antiquity. In Aristotle's work, medical practitioners belonged to one of the three following categories: master physicians, skilled craftsmen, or educated laymen, who studied medicine as part of their general learning.[39] Though medieval medical practitioners had more gradations in status, the groups still fell within the same framework of divisions. On top, by the later Middle Ages, were the physicians trained at universities in medical theory. Much of this training was based upon the classical ideas expressed by Hippocrates and Galen, who also commented heavily on Hippocratic writings.

Within the corpus of teachings of Hippocrates, and especially Galen, who was the particular favorite of medieval physicians, theory was mixed with practice, and while both were believed to be important, theory based on reason was held to be superior to practice based on experience. The main goals of Galenic medicine were to identify the causes of disease, both observable and theoretical. Causation was extremely important because the conditions of individual patients could help reveal larger, more universal principles.[40] Ideas regarding disease causation, prognosis, and therapeutic technique were rooted in the theory of humors, developed in Hippocratic writings and employed and commented upon by Galen.

According to the humoral theory, balance of the four humors within the body was the key to health, and any imbalance therein resulted in disease.

> The human body contains blood, phlegm, yellow bile and black bile. 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.[41]

To humoral theory, Galen added the idea that the four humors combine together to form tissues, which in turn form organs, which then form the body as a whole. [42] And his method of curing diseases remained based on logical applications of humoral theory.

> If it is chilled, it should be warmed; if moistened, it should be dried; similarly if it has been immoderately heated, it should be chilled, and if dried out is should be moistened. These are the four simple methods of curing.[43]

The four methods were matched in various ways to form composites (hot and dry versus cold and moist, etc.), and according to Galen, diseases were caused by one of the eight possible dispositions and these were countered by the eight possible ways to cure.[44]

Galenic medical theory was concerned not only with the practice of medicine but also with epistemology, both medical and philosophical. Galen acknowledged two ways of acquiring knowledge, that of reason and that of experience.[45] Reason explained that various treatments for disease were effective because they took into account both the nature of the ailment and the nature of the substance or action used to counter it. Through reason, the physician could accurately choose which remedies would cure which diseases. Experience was important because, through it, physicians observed the success or failure of specific treatments. Experience, however, did not necessarily take into account the nature of the disease.[46]

Galen argued that reason was superior to experience because reason understood the natures of diseases and the operations of the various parts. For him, experience could result in some medical successes, but this was almost accidental, and thus, inferior.[47]

> For they will overturn the entire Logical method if they allow that it is possible to arrive

> at a therapy (for some ailment) without understanding the disposition (responsible for it). For they will all arrive at cures by trial and error, as long as they don't base their indication on the nature of the matter itself.[48]

Galenic theory held that it was absolutely necessary to understand the nature of the body, and not just to posses experience, if one wanted to be a successful physician, though Galen himself did not reject completely the idea that experience could provide sound and useful knowledge.

> When I take as my standard the opinion held by the most skilful and wisest physicians and the best philosophers of the past, I say: The art of healing was originally invented and discovered by the logos in conjunction with experience. And to-day also it can only be practiced excellently and done well by one who employs both of these methods.[49]

Thus, medieval, university-educated physicians were steeped in medical traditions that had been handed down for centuries. They, like Galen, believed reason to be superior to experience and consistently favored the ideas and teachings of ancient medical authorities over practically gained experience.

Next on the hierarchy of medieval medical practitioners were surgeons. As a category, these were less rigidly defined. Generally, most of their medical preparation was based in experience very much like a skilled craftsman, however, they may also have had some theoretical training as well. In those universities in northern Europe, surgery was not part of the curriculum, though, as apparently at Montpellier, it was taught outside of the formal medical curriculum.[50] At Italian universities, such as Bologna, however, surgery had long been incorporated into the curriculum, though even there, physicians maintained superiority over the surgeons.[51] Nevertheless, surgeons were likely to have some training in medical theory even if most of their knowledge was considered empirical. Beneath the surgeons, were the barber-surgeons, who were trained through apprenticeship and had no training in theory.[52] Apothecaries were still lower on the scale, despite the fact that physicians depended upon them to mix their

medicines.[53] Finally, at the bottom of the ladder, and continuously harassed by physicians and universities seeking to control their practice, were unlicensed, non-professional, non-trained practitioners, such as midwives. Generally, this category flourished among the poor, whom physicians rarely sought to treat, and in rural areas, where physicians rarely sought to operate.[54]

Classical medical practice had, at least in rhetoric if not strictly in actuality, drawn a line between manual labor, such as surgery, which was menial, and theoretical learning, such as medicine, which could and should be studied by educated men of social status.[55] The early medieval period, before the rise of universities, saw a merging of categories into one group of medical practitioners, with "no clearcut distinction between physician and surgeon and pharmacist."[56] Early medieval medical study tended to be general in nature, and favor pharmaceutical medicine over surgery. Additionally, early medieval medical practitioners were also members of the clergy.[57]

With the development of medieval universities in the twelfth century, classical distinctions between manual labor and speculative study began to reassert themselves and become institutionalized in higher medical study. This was perhaps in part because the universities became places chiefly of speculative studies as opposed to technical, apprenticeship-based learning.[58] Within the medieval universities, the seven liberal arts formed the basis of education while theology, law, and medicine were considered the higher faculties, which could be studied generally only after the groundwork of the liberal arts was achieved. Each of the higher faculties was intended to be a speculative study, though they each had practical applications in medieval life. Medicine, however, had to fight for its status as a speculative discipline. Regarding this, Bullough writes,

> Medicine lacked the intellectual prestige of theology, or the opportunities for advancement found in law, but it was an aristocratic profession nonetheless. In order for

> medicine to live up to its speculative status, which it had newly won, the physician would be extremely loath to use manual techniques.[59]

Thus, it is argued that as the study of medicine became institutionalized in universities, especially in those of northern European areas, so also did a growing split between physicians and surgeons. Physicians were to be speculative practitioners separate from, and superior to, surgeons seen as manual craftsmen.

Within the universities, however, the practice of medicine was not completely divorced from theory, and indeed, universities in northern Europe developed a different relationship between medicine and surgery than did those in Italy. In Italy, the first establishment of medical learning was the school at Salerno. Salerno's origin and early history is debated and the subject of speculation, though Salerno seems to have been a center for medical practice from at least the tenth century, if not earlier.[60] Salerno's medical school did not receive official recognition until 1231, when Frederick II, king of Sicily issued an edict forbidding the teaching or practice of medicine within his dominion without a license granted only after examination by the masters of Salerno.[61] Yet, though Salerno was only officially recognized, and did not enjoy the privileges and status of regular universities until relatively late, it had attained widespread fame as a center for medical education at least two centuries earlier.[62] The Salerno medical school is credited with reviving classical medical science in Europe, chiefly through translations of earlier Greek works and the introduction of Arabic influences through the work of translation into Latin of Constantinus Africanus.[63] Through the work of Constantinus and others, a corpus of medical literature, composed of translations, practical manuals, and later commentaries, grew up at Salerno for the purpose of both the practice and teaching of medicine, and this corpus became widely famous throughout Europe.[64] Yet, despite the writings produced by Salernitans, the

medical school at Salerno gained a reputation among more northern physicians for producing something more like craftsmen practitioners, as opposed to learned physicians. Northern university medical education was soundly based upon prior study of the liberal arts, and physicians there consequently began to view those more practically educated as inferior. Thus, Salernitans were seen as having perhaps technical superiority but lacking in theoretical grounding.[65] In any case, by the mid thirteenth century, Salerno's medical school was in decline, and its prestige was being eclipsed by the growing importance of other medical faculties, especially Bologna, Montpellier, and Paris.[66] Historians have developed different reasons to explain Salerno's decline. Among them are that it was weakened as a result of political power struggles in which it was vitally affected and the idea that by the mid-thirteenth century, other areas of Europe had attained the direct communication with the Arab and eastern Christian world over which Salerno formerly had something of a monopoly.[67] Additionally, medical faculties elsewhere were growing and building on Salerno's contributions.[68]

Reaching prominence in the thirteenth century, the University of Bologna was chiefly renowned for its law school, yet its medical school was also famous, having a particular reputation for its innovation and the inclusion of surgery within its medical curriculum.[69] Additionally, Bologna, along with the university at Paris, was something of a model for other medieval universities, having a large influence upon their formation and organization.[70] Another important facet about Bologna was that the faculties of the liberal arts and of medicine were combined into the single body of the *collegium magistrum*, and this body was dominated by the physicians as opposed to the liberal arts professors.[71] Many of the leading physicians at Bologna were both physicians and surgeons, and several prominent surgeons of the thirteenth and fourteenth centuries, such as Guy de Chauliac, had studied at Bologna.[72]

The university of Bologna was indeed unique in its inclusion of surgery within its medical curriculum, and this was a major point of difference between it and other universities in the North. As part of this point of difference, Bologna was also distinguished by its use of human dissections for the purpose of teaching anatomy, and it may have been the first school to allow human dissections since the classical period. Human dissections were performed at Bologna from about the second half of the thirteenth century onward. Apparently, the original reason for allowing human dissection, as religious sensibilities discouraged the practice, was in order to collect evidence for legal matters, yet thereafter, physicians and surgeons at Bologna sought to continue the practice in order to better study human anatomy.[73] Such practices helped Bolognese physicians and surgeons produce several important works on surgery and anatomy, such as the *Anatomia,* written by Mondino de' Luzzi in 1316, which was likely meant to be read aloud during dissections while one surgeon performed the dissection and another pointed out the pertinent areas.[74] Human dissections still appear to have been done rather infrequently, but to have been popular. In an effort to quell disputes among physicians and surgeons, the university issued regulations in 1405 to govern dissection procedures:

> Since the performance of dissection regards and pertains to the industry and advantage of scholars, and quarrels and rumors have often been customary in finding or searching for bodies from which or of which dissection should be made, they decreed and ordained that any doctor or scholar or anyone else shall not dare or presume to acquire for himself any dead body for such purpose of dissection, unless he has first obtained permission from the rector then in office. The rector, moreover, is held and required in giving permission to doctors and scholars to observe quality and order, when the said license is requested. Also, that not more than twenty persons may attend the dissection of a male; and not over thirty, the dissection of the corpse of a woman. And that no one may attend a dissection unless he has been a student of medicine for two whole years and is in his third year, even if he has attended classes at a forbidden time. And he who has once seen a dissection of a man cannot attend another the same year. He who has attended twice cannot attend again in Bologna except the dissection of a woman, which he may see once and no more, whether he has seen a man dissected or not.[75]

While surgery was an integral part of the curriculum at Bologna, it is perhaps important to note that surgery was still considered inferior to medicine. While many physicians were also surgeons, surgeons who were not also physicians were in inferior positions. Furthermore, much of the medical curriculum was still centered on classical works of medicine by Galen and Hippocrates supplemented by additional Arab works, and the liberal arts.[76] Thus, though Bologna uniquely united medicine and surgery, and medical students eagerly attended dissections, medicine was still considered the highest discipline, and students may not have ended up with very detailed and complete knowledge of anatomy.[77]

The university at Montpellier also boasted a famous medical faculty by the thirteenth century, and along with Bologna and Paris, was one of the universities considered worthy of the designation *studium generale.*[78] Additionally, Montpellier's medical school was in a geographical position to take advantage of the influence of several cultures on its medical training. It was duly influenced by both the Muslim schools of Spain and the Jewish schools of southern France, in addition to the Christian school at Salerno.[79] In its twelfth century history, William VIII, then ruler of the city, granted the right to teach medicine at Montpellier to any qualified teacher regardless of place of origin. However, as ecclesiastical control over the university increased, as a result of indifference on the part of secular rulers, the results were twofold. First, the continued participation and encouragement of Muslim and Jewish doctors was stifled. Second, ecclesiastical and papal authority worked to strengthen the university, and along with it, the medical school attached, in an effort to fight against then current heresies.[80] By the mid thirteenth century, the medical school at Montpellier was definitively controlled by ecclesiastical authorities with the consequence that no physician was allowed to teach at the university unless he had been approved by the bishop, with the advice of the other masters being

considered.[81]

Like other medical schools, Montpellier had a list of classical and Arabic works that had to be mastered by anyone presenting himself for an advanced degree in medicine. The list of necessary works included several works by Hippocrates, Galen, Avicenna, Rhazes, Constantinus Africanus, and Isaac, along with various commentaries on their works.[82] In addition to studying medical texts, students also studied anatomy, probably through the use of diagrams first, though by 1340, the chancellor of the university was to see to it that a human dissection was performed every two years. Though dissections were seemingly held only infrequently, if at all, Montpellier was still the only medical school in France to allow them at the time.[83] This may be considered remarkable when it is remembered that Montpellier was mostly controlled by ecclesiastical powers. Additionally, surgery was taught at Montpellier, however it is likely that it was done outside of the official university structure because no special surgery degrees were awarded and Montpellier had no masters specifically of surgery.[84] It has been contended that, while both medicine and surgery were studied in and around Montpellier, the two disciplines were separate, taking different courses of development, and were not connected at Montpellier simply because they were both studied in the area.[85]

Medicine and surgery had a different relationship to one another at the other great medical school of the thirteenth century, the University of Paris. The University at Paris boasted well-established faculties of theology, law, and medicine as well as a liberal arts faculty, which was the basis of the educational process through which students passed on their way to the higher studies.[86] Paris was the premier seat of theological studies in the thirteenth and fourteenth centuries, and as such, the theological faculty at Paris overshadowed the other faculties, including the medical one.[87] Nevertheless, the medical school at Paris was probably the most

famous, the richest, and largest medical school at the time of the Black Death.[88] The medical school of Paris did not have the reputation for innovation in medicine that Bologna possessed and was instead known for its grounding of medical education in the liberal arts. At Paris, as at other universities, it was normal, though not always necessary, for students wishing to pursue an advanced degree in medicine to first obtain a degree in the liberal arts, and thereafter, the medical education at Paris' school was dominated by the study of the theoretical elements of medicine.[89]

The medical faculty at Paris was separate from the other faculties and had composed statutes for itself around 1270. These statutes laid out student requirements in terms of length of study and examination procedures as well a providing a list of required reading, lecturing, and practice.[90] In order to become a bachelor in medicine at Paris, students had to show that they had studied medicine by attending lectures for at least thirty-two months and had to "swear that they responded twice concerning a question in the classes of two masters, understanding thereby a formal disputation and not at a lecture, or at least once in a general disputation."[91] If a prospective bachelor passed this part of the examination, he then had to swear to observe the rules of the university and that any cursory lectures he would give would be only on books he had heard in ordinary lectures (given by full masters).[92]

After receiving a bachelor's degree in medicine, the student could then go on to earn a license to practice and teach medicine. To do this, the student had to attend medical lectures for five and a half years if he already had an arts degree, or six years, if he did not. These statutes dictated the works that the student was to study, saying,

> The form as to the texts heard is that he should have heard twice in ordinary lectures the art of medicine and once cursorily except the *Urines* of Theophilus, which it is enough to have heard once ordinarily or cursorily; the *Viaticum* twice in ordinary lectures, the other books of Isaac once in ordinary, twice cursorily, except the *Particular Diets* which it is

> sufficient to have heard cursorily or ordinarily; the *Antidotarium Nicholai* once. The *Verses* of Egidius are not on the form. Also he should have read one book of theory and another of practice. And to this he should swear; if, moreover, anyone is convicted of perjury or lying, he can be refused the licentiate.[93]

This course of study was heavily weighted toward Galenic theory and the works of Hippocrates. Though neither Galen nor Hippocrates are listed specifically, Galen's works, are certainly covered under the term the "art of medicine," which probably included his *Tegni* as well as treatises of Philaretus and Theophilus and commentaries of Galen's work.[94] And Hippocrates was learned through the translations made by Constantinus Africanus, the translator of the *Viaticum.*[95] The Hippocratic works *De Regimine acutorum morborum, Prognostics,* and, *Aphorisms* were likely studied as part of this curriculum, perhaps covered within the "art of medicine."[96] The works of Isaac included *Liber unrinarum, Liber febrium, Liber diaetarum universalium,* and *Liber diaetarum particularium,* which were commentaries on Galen and Hippocrates and were influenced by early Arab medicine.[97] Study at Paris was thus based upon knowledge of classical and Arab-influenced works and commentaries, the main goal of which was the understanding of the causes of disease and methods of prevention, as opposed to practical, curative medicine.[98] This curriculum valued, above all else, the authority of Hippocrates and Galen.

After completing this study, the prospective licentiate had to give lectures and pass an examination of the other masters and be approved by the chancellor advised by the said masters. A passing candidate received a license to teach and practice medicine. Before becoming a full master, however, the licentiate had to practice medicine outside of Paris itself for two summers or inside Paris for two years.[99] Thus, though medical learning at Paris was theoretically based, medical practice was required before the most advanced status could be attained by a student.

Throughout these studies, surgery was absent from the curriculum. Surgery was not taught at the university during the thirteenth and fourteenth centuries, and any surgeons practicing or teaching surgery in the area of Paris were not connected to the university itself.[100] Paris actively worked to keep medicine separate from surgery. First, bachelors of medicine were not to practice manual surgery. Second, surgeons, along with other non-physician medical practitioners and Jews, were admonished in a Paris statute from 1271 for attempting to exceed the bounds of their craft. Surgeons specifically were expressly told to limit their practice to manual operations, and likewise, apothecaries were commanded to limit theirs to mixing drugs.[101]

> Also, since certain manual operators make or posses some confections but totally ignore their cause and reason, nay do not even know how to administer them and the relation which medicines have to disease, especially in all particular respects, since those matters are reserved exclusively to the industry of the skilled physician, yet these manual artisans thrusting their sickle into alien crops participate, as we are assured by dependable testimony, in certain cases rashly and to public scandal, in this likewise incurring sentence of perjuries and excommunication; therefore we strictly prohibit that any male or female surgeon, apothecary or herbalist, by their oaths presume to exceed the limits or bounds of their craft secretly or publicly or in any way whatsoever, so that the surgeon engage only in manual practice and as pertains to it, the apothecary or herbalist only in mixing drugs which are to be administered only by masters in medicine or by their license.[102]

Thus, though physicians' efforts to control other medical practitioners, especially surgeons and apothecaries intensified in the early fifteenth century, the roots of the distinction were established much earlier in Paris' history. The physicians trained at the University of Paris viewed medicine as superior to surgery because medicine was based in learned theory, while surgery was perceived as a manual craft. Even in 1408, if a surgeon wished to become a physician, he had to first swear never to practice manual surgery again.[103] The physicians of Paris sought to make clear the distinction and to prevent physicians from lowering themselves to the level of a manual

laborer and surgeons from usurping the practice of medicine out of physicians' hands.

Anatomy was also a neglected subject at the University of Paris. Dissections were apparently not carried out at Paris during the thirteenth and fourteenth centuries.[104] Likewise, anatomy was not part of the formal curriculum until much later. At Paris, the emphasis was definitively on theories of disease causation and prevention, and any manual task in medicine was left to those without university training. As one of the main models for other universities, the system of medical education at Paris had a large influence on many other medical schools in northern Europe, and because of this, surgery and dissections were left out of the training that many thirteenth and fourteenth century physicians received.

By the fourteenth century, many other medical faculties existed in universities and schools around Europe, however, none attained the size, prestige, and influence of the ones at Bologna, Montpellier, and Paris. The others were smaller and less influential on medical practice, both across Europe and even within the vicinities of their own institutions. Probably the most important medical school aside from Salerno, Bologna, Montpellier, and Paris was that at the University of Padua, which itself was an offshoot of Bologna, being founded originally as a secession from Bologna in 1222.[105] Though the university basically ceased to exist from 1237 to 1260, after 1260, when the city of Padua began to attract professors to the university by offering salaries, the university's medical school grew, and by the end of the fourteenth century, had eclipsed the law school in terms of dominance within the university itself.[106]

The chief point of interest with regard to Padua's medical education, however, is the use the medical faculty made of Aristotle's works. Padua utilized Aristotle's writings on the nature of the physical world, natural history, and scientific methodology to teach medical students at a time when most other universities, such as Paris, focused on Aristotle's more theologically

acceptable writings in order to train theologians.[107] Aristotelian logic was thus combined with medicine at Padua in a way not seen in many other medical schools.[108] Some scholars have linked the use of Aristotle by physicians and the joint development of an Aristotelian method of investigation and the Paduan medical tradition with the development of the scientific method later in the seventeenth century.[109] While not all agree with this theory, it is interesting to note the possible groundwork laid at Padua, through Aristotle's writings and the physicians that learned and taught them, and the later development, also at Padua, of a method of diagnosis of disease involving Aristotelian logical processes. Combining the resolutive (from effects to cause) and compositive (from cause to effect) methods of logic was seen as necessary to diagnosis and true understanding of disease. In this combination, the observer would first observe the effects, then seek their cause, and finally explain the effects from the cause. The results eventually were a method for the practice of medicine.[110]

Although most of the universities that boasted medical schools were in French and Italian areas, England also had two medical schools as well, one at Oxford and one at Cambridge.[111] The stronger of these two was Oxford, but even there, the medical faculty remained the smallest of Oxford's higher faculties and was subordinated to the faculty of arts.[112] The interesting aspect of Oxford's medical education, however, was that, unlike other universities wherein students pursuing medical degrees were generally forbidden, or at least discouraged, from studying other disciplines, perhaps in order to preserve the superiority of medical study, students at Oxford were allowed to study medicine without pursuing a degree in it or to move on to other studies after earning a medical degree.[113] Medical study in England, thus, was not prominent enough to be jealously guarded as an exclusive higher faculty. Instead, any student at Oxford could study medicine, even if not intending to become a medical practitioner. This was, perhaps, both a

weakness and a strength to medicine in England. It may have been a weakness in that it shows that the medical faculty never achieved dominance and control over the practice of medicine, and thus, were not well positioned to prevent unlicensed practices by untrained persons. Yet it may have been a strength because it allowed many students pursuing other studies to become acquainted with medical theory and to carry this knowledge into other fields.[114]

Chapter 3: The Onset of the Black Death

For all the medical training imparted to physicians in universities across Europe, medical practitioners were completely ineffective in the face of the Black Death, which swept through Europe beginning with its entry into Italian ports in 1347. By the end of that year, the Black Death had visited most of southern Italy. France, the Low Countries, the Iberian Peninsula, England, Cornwall, Wales, Ireland, the Germanic states, Scandinavia, Poland, Bohemia, Lithuania, and Russia would be hit in turn by 1350.[115] Though formerly in accord, more recently, historians have debated whether or not the Black Death was indeed the work of plague in its various forms, namely bubonic, pneumonic, and septicaemic, and many works explaining the various theories can be readily found. Yet, regardless of whether the Black Death was caused by plague, some other disease, or a combination of many diseases, it was new to medieval European populaces, killing large numbers of people, devastating economies, and causing social, political, and religious structures to, at least temporarily, crumble. Additionally, the Black Death sent medical practitioners, especially physicians, scrambling to explain the causes and find solutions to combat the devastating illness. Apparently, their medical training did not prepare them for such a disaster, and they could find little in the way of effective means to either prevent or cure the disease.

Several comments left by contemporary observers describe the onset of the Black Death in various areas, the symptoms, and the quick ways in which people died in great numbers. The ineffectiveness of conventional medicine against the Black Death, if not directly stated, certainly was shown by the fact that the authors note that nothing could stop the disease.

One observer, Marchione di Coppo Stefani, the author of *The Florentine Chronicle*, noted the following regarding the Black Death:

> In the year of the Lord 1348 there was a very great pestilence in the city and district of Florence. It was of such a fury and so tempestuous that in house in which it took hold previously healthy servants who took care of the ill died of the same illness. Almost none of the ill survived past the fourth day. Neither physicians nor medicines were effective. Whether because these illnesses were previously unknown or because physicians had not previously studied them, there seemed to be no cure. There was such a fear that no one seemed to know what to do. When it took hold in a house it often happened that no one remained who had not died.[116]

Likewise, Boccaccio also described the onset of the Black Death in the area of Florence:

> Not such were they as in the East, where an issue of blood from the nose was a manifest sign of inevitable death; but in men and women alike it first betrayed itself by the emergence of certain tumors in the groin or the armpits, some of which grew as large as a common apple, other as an egg, some more, some less which the common folk called gavoccioli. From the two said parts of the body this deadly gavocciolo soon began to propagate and spread itself in all directions indifferently; after which the form of the malady began to change, black spots or livid making their appearance in many cases on the arm or the thigh or elsewhere, now few and large, then minute and numerous. And as the gavocciolo had been and still were an infallible token of approaching death, such also were these spots on whomsoever they shewed themselves. Which maladies seemed to set entirely at naught both the art of the physician and the virtue of physic; indeed, whether it was that the disorder was of a nature to defy such treatment, or that the physicians were at fault – besides the qualified there was now a multitude both of men and of women who practiced without having received the slightest tincture of medical science – and, being in ignorance of its source, failed to apply the proper remedies; in either case, not merely were those that recovered few, but almost all within three days from the appearance of the said symptoms, sooner or later, died, and in most cases without any fever or other attendant malady.[117]

From these statements, it is clear that in the midst of the chaos of the Black Death, not only did trained physicians fail in combating the disease, but so too did the untrained practitioners who emerged in this environment. It is conceivable that the sick turned in desperation to whomever claimed to be able to help, and whether trained in medicine or not, there was little anyone could do.

Jean de Venette, in his work, *The Chronicle*, also described the chaos that the plague caused when it descended upon France. He noted that the plague was simply another disaster to

be added to war and famine, which had already been ravaging France. The plague, however, killed so many that they could not be buried fast enough. He wrote,

> All this year and the next, the mortality of men and women, of the young even more than of the old, in Paris and in the kingdom of France, and also, it is said, in other parts of the world, was so great that it was almost impossible to bury the dead. People lay ill little more than two or three days and died suddenly, as it were in full health. He who was well one day was dead the next and being carried to his grave. Swellings appeared suddenly in the armpit or in the groin – in many cases both – and they were infallible signs of death. This sickness or pestilence was called an epidemic by the doctors. Nothing like the great numbers who died in the years 1348 and 1349 has been heard of or seen or read of in times past.[118]

The "doctors" could only declare the plague to be an epidemic and did little more to stem the deaths caused by it.

Physicians in areas outside of Europe itself had no better luck when dealing with the Black Death. Though medicine in the Byzantine Empire has not yet been touched upon here, its medical practices were closely related to those in Western Europe, both being heavily influenced by Greek and Arab medical teachings through the same body of medical literature. The Byzantine Emperor John VI Cantacuzenos described the Black Death in Constantinople in his writing, *Historiarum*, which gives much the same impression as descriptions of the plague by western observers.

> So incurable was the evil, that neither any regularity of life, nor any bodily strength could resist it. Strong and weak bodies were similarly carried away, and those best cared for died in the same manner as the poor. No other [major] disease of any kind presented itself that year. If someone had a previous illness he always succumbed to this disease and no physician's art was sufficient; neither did the disease take the same course in all persons, but the others, unable to resist, died the same day, a few even within the hour. Those who could resist for two or three days had a very violent fever at first, the disease in such cases attacking the head; they suffered from speechlessness and insensibility to all happenings and then appeared as if sunken into a deep sleep. Then if from time to time they came to themselves, they wanted to speak but the tongue was hard to move and they uttered inarticulate sounds because the nerves around the back part of the head were dead; and they died suddenly. In others, the evil attacked not the head, but the lungs, and forthwith there was inflammation which produced very sharp pains in the chest.[119]

John's writing continues on to detail more of the gruesome symptoms those afflicted with the disease exhibited, and though he was an emperor and not a physician, he provides rather detailed descriptions. It is clear in this writing that he, like other observers, did not blame the high death toll the plague took on physicians' incompetence but rather on the peculiar viciousness of the illness itself.

Describing the plague's spread through Muslim areas, Abu Hafs Umar ibn al-Wardi detailed the steps nobles in Aleppo took to help alleviate the Black Death among themselves. He wrote,

> Oh, if you could see the nobles of Aleppo studying their inscrutable books of medicine! They multiply its remedies by eating dried and sour foods. The buboes which disturb men's healthy lives are smeared with Armenian clay. Each man treated his humors and made life more comfortable. They perfumed their homes with ambergris and camphor, cypress, and sandal. They wore ruby rings and put onions, vinegar, and sardines together with the daily meal. They ate less broth and fruit but at the citron and similar things. If you see many biers and their carriers and hear in every quarter of Aleppo the announcements of death and cries, you run from them and refuse to stay with them.[120]

Al-Wardi concluded that no measures taken, either on the advice of physicians or otherwise, were effective in the end because the plague had been sent by God as punishment for sin and as an opportunity for Muslims to turn away from sin.[121] Thus, in Muslim areas, as in Europe, physicians and the medicine they had learned and practiced were viewed as insufficient to combat the Black Death.

During panic of the Black Death, with medicine seemingly of no avail, many who could do so, including well off, university trained physicians, fled plague stricken areas. Priests were similarly accused of fleeing and leaving the dying alone, without last rights and spiritual comfort.[122] Yet, it was not only physicians and priests, but also neighbors and close family

members who abandoned one another in fear and hopelessness.[123] Marchione di Coppo Stefani described the flight of all of these groups from the sick in the following statement:

> It was such a frightful thing that when it got into a house, as was said, no one remained. Frightened people abandoned the house and fled to another. Those in town fled to villages. Physicians could not be found because they had died like the others. And those who could be found wanted vast sums in hand before they entered the house. And when they did enter, they checked the pulse with face turned away. They inspected the urine from a distance and with something odoriferous under their nose. Child abandoned the father, husband the wife, wife the husband, one brother the other, one sister the other. In all the city there was nothing to do but to carry the dead to a burial. And those who died had neither confessor nor other sacraments. And many died with no one looking after them. And many died of hunger because when someone took to bed sick, another in the house, terrified, said to him: 'I am going for the doctor.' Calmly walking out the door, the other left and did not return again. Abandoned by people, without food, but accompanied by fever, they weakened. There were many who pleaded with their relatives not to abandon them when night fell. But [the relatives] said to the sick person, 'So that during the night you did not have to awaken those who serve you and who work hard day and night, take some sweetmeats, wine or water. They are here on the bedstead by your head; here are some blankets.' And when the sick person had fallen asleep, they left and did not return.[124]

Guy de Chauliac, famous surgeon of this time, also commented on the flight of physicians during the Black Death. He also stated that those who did stay, were ineffective:

> It was vnprofitable forsothe for leches and schameful, for thai were noght hardy to visite for drede of infectynge. And when that thay visited, thay dede litel and thai wanne noght. Alle thoo forsothe the whiche took sekenesse deyde, outtake a fewe aboute the ende, the whiche scapede with bubones.[125]

According to Chauliac the best way to avoid the plague was to flee, and he recommends flight and then the use of certain remedies to keep one's self comforted and healthy thereafter. Chauliac himself, however, decided not to flee. Eventually falling ill with it himself, he used his remedies on himself, but though he recovered, he attributed his recovery not to his remedies, but to God.

> The particular cause and suffrynge was the disposicioun of the bodyes in euel humour and feblenesse and opilacioun. And for that, the commune peple deyde, trauayllynge and

> euel-lyuynge.
> Of the cure it was laboured in preseruynge afore the caas and in the cure in the case. In preseruynge ther was no bettre than afore the infeccioun to fle the contraye and to purge hym with balles of aloes and to late blode by blode lastes and to rectifie the ayer with fyre and to conforte the hert with tryacle and with swete apples and with such thinges that conforten the humours with bole armonyak and to withstonde the putrifaccioun with soure thinges.
> In the cure, blode lastes and euacuaciouns were made, and cordial syrups and letuaries. And utter apostemes were matured with fyges and with oynouns sodden and stamped and medled with soure dowh and with bottre. And after, they were opened and they were heled with the curacioun of vlceres. Felons were ventoused and garsed and cauterized.
> And for to eschew euel lose, I durste nought goo forth. With contynue dredes I kepte me with the forsaide thinges als mykel as I myghte. Neuerthelatter toward the ende of the pestilence, I renne into a contynue feuer with an aposteme in the schare, as it were sixe wokes. And I was in so grete perile that alle my felowes trowede that I schulde be dede. And I scapede by the comaundement of God when the aposteme was matured and heled, as I haue saide.[126]

Thus, not all physicians fled, but many certainly did, as the cures available were simply unreliable. People who survived were lucky. As physicians were well aware that their training had not prepared them to be successful against this disease, and many, like Chauliac, recommended flight as the best preventative measure, it is, of course, likely that many took their own advice.

If physicians were guilty of flight during the Black Death, then they certainly were not the only ones, and perhaps survived with a clearer conscience than those who had abandoned a family member. However, instances such as those described above wherein physicians that did visit the sick demanded exorbitant fees and seemed to skimp on the examination of the patient did perhaps deal a blow to people's faith in medicine. Not only were medical cures ineffective, but the physicians themselves seemed greedy, uncaring, and uncommitted. Learned medicine and its practitioners were failing all over Europe in the face of the Black Death.

Chapter 4: The Effects of the Black Death on Medicine

Plague Tractates, Surgical Manuals, and Other Writings

The Black Death placed learned medieval medicine at a crossroads. Physicians, especially, had an opportunity either to succeed during the Black Death, and thereby gain credibility and prestige for their emerging profession, or to fail miserably, lose credibility as effective and ethical medical practitioners, and ultimately lose their status and prestige in society. Coupled with the perceived ineffectiveness and greed of licensed and trained physicians, the Black Death elicited a surge in competition for physicians in the form of unlicensed practitioners, with perhaps little or no formal medical training, as evidenced by the statement above from Boccaccio. Whether because physicians were not available, or these practitioners had cures they believed would be effective against the plague, or simply that desperate patients provided a ripe opportunity for profit that could not be overlooked, there was certainly a rise the activity of unlicensed medicine. Additionally, since university trained physicians generally limited their practice to the more affluent members of society and were concentrated in urban areas, non-university trained medical practitioners were usually the only option available to members of the general populace.[127] As the Black Death rendered learned medicine visibly useless, university-trained physicians' ability to claim superiority decreased. As a result, physicians had to act, even if not directly with patients, in response to the Black Death, and had to do so in ways that retained and consolidated their position in society.

Physicians responded to the Black Death in two main ways. First, physicians wrote copious numbers of plague tractates, wherein they detailed the causes of the plague, ways in which it could be prevented, and in some cases, though more lightly treated, cures or ways in which to alleviate the effects.[128] One important plague tractate was written by the medical

faculty at the University of Paris in 1348 at the request of King Philip VI of France.[129] This work is written from a philosophical vantage point, embodying the medical teachings of the University of Paris itself and is chiefly concerned with explaining the causes of the plague and ways to prevent its attack on individual life.[130] According to this writing, aside from the wrath of God, who chose to send the epidemic in the first place, the Black Death had two causes, one celestial and one terrestrial. The celestial causes, in this case, the conjunction of the planets Jupiter, Saturn, and Mars, was seen to be the superior cause, and the terrestrial cause, the corruption of the air, was the inferior cause, and was itself the result of the planetary alignment.[131] The conjunction of the three planets had caused, they reasoned, the earth to exude poisonous vapors, which then corrupted the atmosphere.[132] The medical faculty was specific in the details of the causative planetary alignment, speaking with authority and confidence on the matter. It declared that the alignment of the three planets occurred on 20 March 1345 at one o'clock in the afternoon in the sign of Aquarius, along with other conjunctions and eclipses. Warm and humid Jupiter was argued to have drawn up evil vapors from the earth and water, while Mars, hot and dry, set fire to the vapors, igniting the plague as well as other natural disasters. Saturn, for its part, was to add evil wherever it went, and when in conjunction with Jupiter, to cause death and depopulation.[133] In these conclusions, the medical faculty relied upon ancient and medieval ideas regarding the influence of planetary movements upon the natural environment and human life. The cause, then, of the plague was not any human actions, but the forces of nature (and of God who made nature) at work.

Thereafter, the bulk of the work is devoted to explaining preventative measures. With regard to the best environment in which to avoid the plague, the faculty commented as follows:

> He who wants to protect himself from this epidemic should choose air as clean and pure as possible; dry, with no mixtures of corrupting vapors. This suggests two

> considerations: one on the choice of air in the place of habitation, the other on the general nature and substance of the air. When talking about the first point, let's follow the advice of Halys, who expresses himself in these terms: "The inhabitants should leave any place where and in which [the air is mixed with corrupting vapors], if possible. If not, they should choose a dwelling away from the wind channels that carry these corrupt vapors, as in humid houses, where the air is stagnant." With those considerations, in these gloomy and suspect times, low-built houses are best.
> Therefore, it is necessary to have such a dwelling, far from marshy, muddy, and stinking places with bad, stagnant waters and trenches; one whose windows can be opened to the northern winds. Always be on guard that these winds do not blow across corrupt and infected places, and make sure that the windows facing the south stay closed and locked. If they must be opened, be sure that they are opened neither before sunrise nor before starting a fire.[134]

The medical faculty consistently emphasized the avoidance of contaminated air as the best way to prevent plague. Their writings go on to give various pieces of advice on how contaminated air may be avoided in different situations.[135] Regarding exercise and bathing, they recommended the following precautions:

> On exercise and bathing, there are two things to consider. First of all, with regard to exercise, those not used to it should not start in times of epidemic. As long as the air is calm, those who are in the habit [of exercising] should do a little less than normal so that they do not intensify the need to breathe. However, if the air is not calm, but troubled and infected, do not go out of the lodging, but do a little exercise in the room or in the court. Some authors prescribe exercise, but one risks doing it to excess in this present epidemic.
> The second thing to consider is taking a bath, and according to us, it is best to avoid taking a hot one because it relaxes and moistens the body. A hot bath should be rare, and rarer still for those whose body is replete. Only those who are strongly habituated to it and those with a fat and compact build can do it to moisten themselves in trying to expel the sickness.[136]

With regard to diet, their main advice was essentially moderation.

> On the subject of eating and drinking, [we have] observed that one should avoid all excesses of food and drink because humid things are predisposed to the epidemic. One should eat lightly, choosing food that is easily digested, capable of enriching the blood, such as bread made with a high-quality tender wheat and of a good harvest, well cooked, sufficiently fermented, of one or two days at most and mixed with a little bran and barley. Among meats, it is necessary to choose lambs of one year, tender pieces of veal, kid, rabbits, young chickens, hens, partridges, pheasant, starlings, capons, and small birds

> such as the lark, gamaleon and others like them. Young mutton, if it has to be boiled, must be salted for one day first. And, boiled meats should be seasoned with aromatic spices like ginger, cloves, cubeb pepper, cardamom, nutmeg, mace, or powder and shell of nutmeg, and especially crocus and cinnamon, with some vinegar or verjuice.[137]

Though it was perhaps more theoretically based than other plague tractates, the treatise written by the Paris medical faculty was influential and served as the basis for other plague writings for decades.[138] While other writings paid somewhat more attention to practical treatments to alleviate symptoms of plague, such as fever, few written in the time of the Black Death neglected discussions of the plague's origins and way to prevent it. Learned medicine was based on such discussions and on the opinions of accepted authorities, yet no authority covered plague, and as such, physicians at this time were essentially left to their own devices. Naturally, many fell back on what they knew and used it in attempting to confront the Black Death.

Even more practical statements on the plague made by physicians were often still accompanied by long discussions of the disease's causes. One example of this is the tractate *Morbi in posterum vitandi and remedia* written by Abu Ja'far Ahmad ibn 'Ali ibn Khātimah, a physician of Almeria, as the plague was raging. This writing describes the practical measures the author himself used to combat plague, yet it also goes into great detail in describing the nearer cause of the disease, namely corrupted air, though water could also be so corrupted, and, thus, also cause plague.[139]

> Understand that the immediate cause is usually the corruption of the air, which surrounds people and which people inhale. This corruption can be [either] partial or total. Partial corruption results from the degradation of all or some of the air's accidental characteristics, without changing or soiling the element [air] itself. This can take place by adding to or reducing the number of the air's [accidental] characteristics – changing its natural condition – or by mixing and combining it with foreign things….
> Total corruption, however, is due to the corruption of the elemental components [of the air] by rotting, in such a way that the air takes on a completely different mixture….
> The air, which is healthful for us and necessary for life, is not an entirely pure element; rather, it is a compound of aqueous fumes, dry smoke developed from the earth, fine

> particles of fire, and mostly [elemental] air. All of this has been blended into what we call 'air.' For this reason, a process of rotting can shrink the [amount of elemental] air [in 'air'] into a smaller and smaller portion in relation to these [other] substances. In regard to pure elemental air, this cannot occur. But if elemental air were in its pure condition, perhaps it would be above the atmospheric level where the air currents are circulating – possibly.
> The same can be said of water, particularly in those lakes where calm water is found, generally in shallow waters. These are penetrated by atmospheric air currents, stirred up by storms and therefore become putrid as well.[140]

Thus, even when discussing practical remedies, perhaps tried by themselves on their own plague patients, physicians continued to engage in speculative discussions regarding the causes of plague.

Ibn Khātimah did, however, offer concrete treatments for plague, which he distinguished from mere methods of prevention in a way that was rare in comparison to several other tractates, and especially when compared to the advice offered by the medical faculty of the University of Paris. His treatments for plague began with bleeding the patient after giving him a mixture of vinegar syrup and rose syrup. Blood was to be let from wherever the patient felt pain the worst. Bleeding was to continue until the patient felt weak, which would vary according to the patient and his age and level of strength. Then, after the patient's fever fell, he should be given a mixture of apple and lemon syrups dissolved in rose water and vinegar. Later, he should receive a peppermint broth followed by sour pomegranate. If all went well, the patient should recover, but may have to be bled moderately thereafter in order to make sure all of the poisons from the blood were removed. However, if the sickness returned, had lasted more than two days, or was accompanied by the spitting up of blood or copious vomiting or diarrhea, there was probably little the physician could do, and the patient would likely die, according to ibn Khātimah.[141] Yet, if the patient did not die by the seventh day, he provided instructions for opening any buboes that had filled with pus. He stressed that it was important to wait for the buboes to be ripe for

opening, lest the patient suffer a relapse after the operation. He then prescribed remedies to help heal the irritation caused by the buboes and their opening.[142]

Consilia contra pestilentiam, the plague tractate of Gentile da Foligno, one of the most famous physicians of his time, was also a combination of speculative, abstract discussion of the plague's origins and practical advice regarding its treatments which were based on his own experience in dealing with plague victims.[143] His comments on the astrological causes of the plague are relatively limited in comparison with those in other tractates, but he still included them in his writing, quoting Avicenna on the influence of heavenly bodies on terrestrial life.[144] Regarding the nearer causes, he highlighted the corruption of the air as the most important, but overall, he was frustrated by over-long, speculative discussions of remote and near causation and expressed his preference for practical measures to use against the illness. In the end, he wrote, it did not matter what ultimately caused it, only what may be done to treat it.[145]

> Which of the aforesaid causes it is, however, is of no great moment. It must be believed that whatever may be the case in regard to the aforesaid causes, the immediate and particular cause is a certain poisonous material which is generated about the heart and lungs. Its impression is not from the excess in degree of primary qualities, but through properties of poisonousness; whence poisonous vapors having been communicated by means of the air breathed out and in, great extension and transition of this plague takes place, not only from man to man, but from country to country. And, as has been intimated before, it is no great matter in these causes whether it is a constellation or an earthly or aquarian figure, if only we may know how to resist it, and that a stand must be made against it to destroy it lest it destroy us. As for those wishing to extinguish a fire burning a house, it is enough to know that it is a fire, that it may not destroy us, whether it be produced by fire or by motion; and for those wishing to resist the poisonous bite of a dry asp, it is enough to know that the asp was biting, whether it was generated by coition or from putrefaction.[146]

Gentile also offered specific, personally used treatments with which to combat the Black Death. Like ibn Khātimah, Gentile also began his treatments with bleeding the patient until he was faint and also recommended placing a bleeding cup over any buboes and opening them with

a knife on the second day of the illness. After opening the buboes, he suggested that they be cauterized and then covered with a plaster meant to draw out the poison. He also recommended that certain medicines, some made with ground minerals or metals, be given to the patient in an effort to strengthen him and speed recovery. Yet, in the end Gentile remarked that the best "remedy" of all for plague was actually more of a preventative, namely, flight from plague infected areas.[147] Thus, though he provided treatments, he conceded that they were not certain to cure. They were simply the best he could recommend. Not having the plague at all was, of course, best.

The preceding discussion of plague tractates written around the time of the first occurrence of plague is by no means exhaustive of all the tractates written.[148] However, it is representative of the kinds of writings that circulated as physicians across Europe attempted to explain the Black Death and provide solutions to it. Early tractates were often concerned with questions of the Black Death's causation and prophylaxis against it. Causation and disease prevention were the main subjects of speculative medicine, and as such, physicians educated in such environments gravitated toward the information, learned, analyzed, and commented upon from earlier authorities, that they had studied and understood. Though this is especially exemplified in the writing of the medical faculty of Paris, all early tractates bowed to authority and discussed causation and prevention in some way or another, even if they, like Gentile da Foligno and some others, had developed their own methods in how to deal with the pestilence. Thus, the plague tractates demonstrate the state of learned medicine at the onset of the Black Death. This is not to say that all medicine prior to the Black Death was based on textual criticism of ancient authorities was not at all concerned with practice. Indeed, many works of practical medicine had been written by medieval physicians by this time, and in Italian areas,

theoretical medicine and practical medicine had long been studied side by side in universities. Yet, the highest form of medicine was held to be that based on knowledge of medical authorities, and practice itself was to have been firmly grounded in medical theory if it were to be highly respected. Experience alone was not credited with much prestige, but should always be supported by medical theory. That is, at least, if the physician was to be considered learned and not simply a craftsman. Yet, even in 1348, it was apparent that medical theorizing was not sufficient in dealing with the Black Death. The works of Hippocrates, Galen, Avicenna, and all of the other accepted authorities did not provide information for medieval physicians on how to combat an epidemic as strong as the plague. Their works alone did not prepare physicians for the task they had in front of them in 1348. New remedies had to be developed, and even though the most prominent physicians and surgeons were still grounded in theoretical learning, these new remedies would be based in practical experiences with actual plague victims, as the tractates of ibn Khātimah and Gentile da Foligno demonstrate.

Thus, these tractates demonstrate the evolution of medicine in Europe as the Black Death continued and especially as further epidemics of plague broke out in the succeeding decades of the fourteenth and fifteenth centuries. As physicians, and also surgeons, increasingly dealt with plague patients, they were able to gain valuable experience, develop practical strategies, and produce writings exhibiting and advocating their methods. The nature of the tractates changed over time, veering away from speculation on the causes of the plague and toward practical measures to deal with it.[149] The amount of writing devoted to describing the remote and near causes of the plague was reduced in later tractates, or altogether left out, in favor of practical cures. Preventative measures remained popular in plague tractates throughout, however, as it was still preferred to never contract the plague at all. In 1347 and 1348, the plague had been

seen as an entirely new disease, and one so terrible, that it could not effectively be cured. Physicians set about to explain why it had happened at all. Basing it on astronomical occurrences perhaps implied that, once it abated, it was not likely to recur, providing something of a comfort to the ravaged and terrified populaces of Europe. But, when plague epidemics continued to periodically break out in various locations, it was clear that the disease was becoming a regular hazard and was thus something not to be simply explained, but to be conquered. Ancient medical authorities could not help with this. Practical experience had to be gathered and put into practice.[150] The process of this development began in the early years of the Black Death and continued to evolve throughout the fifteenth century. Though initially, the tractates seem to have been a way to assert the dominance of learned medicine, the inability of theory to adequately serve populations in time of plague caused a preference for writings advocating particular, practical measures meant to combat the plague instead of simply explaining it.

The increase of practical, often surgical, writings, makes it clear that the learned physicians of the major universities did not have complete control over plague tractates and other medical writings. With the increasing emphasis on practical writings came an increase in the writing of surgical manuals. This should not be held to mean that all surgical manuals were unlearned or written by craftsmen-like medical practitioners. Instead, two of the most famous medical practitioners of the post-Black Death time were actually both surgeons. One was Guy de Chauliac, surgeon to the king of France and pope Clement VI, and the other John Arderne, surgeon to many nobles and having gained much of his experience in the battlefields of Europe.[151] Chauliac's *Cyrurgie* and Arderne's *Practica* were both practical, surgical manuals, but both men display awareness of medical theory in their works. This is especially true of

Chauliac, who was medically learned, and based his procedures squarely on the shoulders of medical theory, citing and quoting the advice and opinions of accepted authorities on surgical matters and then explaining his procedures. Both of these works were primarily concerned with treatments, related treatments they had personally used, and dealt sparingly with theories of causation, in contrast to various works written by learned physicians.[152]

Concurrent with the production of surgical manuals and practical tractates on the plague was the rise of vernacular medical texts. Scholars have given several possible explanations for the vernacularization that occurred in the decades after the Black Death. Some have argued that Latin education itself decayed after the Black Death, and therefore, medical practitioners had to write in their own languages because they were no longer proficient enough in Latin.[153] Yet this is perhaps an over statement as it seems that even physicians competent in Latin used vernacular texts, leaving notes in Latin in the margins.[154] However, in the post Black Death period, it does seem that many surgeons preferred to write in vernacular languages and many existing works were translated into vernacular languages.[155] While physicians sought to make competence in Latin a requirement in licensing procedures, perhaps to preserve their superiority and to limit the practices of those not so learned in classical texts, this does not seem to have been very successful in the end.[156]

One example of such a vernacular text is *Il trattat in volgare della peste,* written by Michele Savonarola in the mid fifteenth century. In this tractate, Savonarola related his own experiences with the plague to the teachings of Avicenna, whom he called *Il Principe.*[157] Thus, his work is based both on traditional medical learning and practical experience. Savonarola laid out the signs of pestilential fevers and discussed prognoses to be given to patients based on such signs. He wrote,

> Thus we have laid out the signs that indicate the fever. Let us now discuss signs that signify its termination, and by which they ought to make judgments. These will be useful, that thus seeing the dangers to mortals, they comfort friends, the relatives get the patient to confess, to make a will and similar things. But it must be said that most of the time such a fever ends badly, often making fools of the doctors; and therefore, whoever is thus tried, would be wise to confess himself and put his affairs in order.
> But when one sees such good signs as slight fever with the symptoms in remission, the appetite getting stronger, especially in the first days, and also with strengthening of the limbs, and with strengthening of the spirit and no loss of mental faculties, one can be comforted and have hope in a full recovery.
> But when the patient is the face of death, that is worn out, skin color tending to brown and some blotches appear on the face, which begins to turn green, then death is probably not far away. Later, when in the early stages appear some bodily evacuations, sweat, vomit, urine similarly it is a mortal sign. When the urine is thick, cloudy, and does not leave a sediment, it is a very bad sign, especially if the [bodily] strength should be weakened. A mortal sign is watery urine that perseveres, and becomes stinking, black or livid. Also, when the emissions are very fetid, of several colors, especially in the early days, and likewise, when it is also choleric, because of this the patient does not recover. Also, if the emission is greasy, stinking, and over it there appears a greenish tinge, it is mortal. Stinking sweat in the early states is a matter of concern, and it is bad. Stinking vomit, either the green, like a leek leaf and stinking, or the red darkened with blackness like a *fior di ramo*, is mortal. Likewise some pustules appear and later become less evident. Soon after, when the headaches persevere with weakening of [bodily] strength: with these there will be other bad signs with a lightening of the symptoms, it will be a mortal sign. [And if the flux of blood should appear on the seventh (day), and it does not appear on the fourth (day) with a lightening of the symptoms, it will be a mortal sign.] Variations in the pulse with the weakening of bodily strength are a matter of great concern. I hope these present [observations] suffice.[158]

By the time of this writing, several recurrences of plague had coursed through various parts of Europe. Physicians had access to many observations of plague victims, and thus, had ample opportunity for discovering the best ways to care for them. However, it is evident that, despite the progress made, plague was still a deadly disease. Thus, the continued interest in its treatment and the sharing of findings through writing remained an important pursuit well after the Black Death itself.

Additionally, vernacular writings on the plague were produced by non-medical practitioners as well. A popular poem written by the English monk John Lydgate in the early

part of the fifteenth century provides a good example of such writing.

> Who will been holle and kepe hym from sekenesse
> And resiste the strok of pestilence,
> Lat hym be glad and uoide al heuynesse,
> Flee wikkyd heires, eschew the presence.
> Off infect placys, causying the violence;
> Drynk good wyn, and holsom meetis take,
> Smelle swote thynges and for his deffence
> Walk in cleene heir, eschew mystis blake.
>
> With voide stomak outward the nat dresse.
> Risying erly, with fyr have assistence,
> Delite in gardeyns for ther gret swetnesse,
> To be weele clad do thi dilygence.
> Keep welle thi-silf from incontynence,
> In stiwes, bathis, no soiour that thou make,
> Opnyng of humours this doth gret offence,
> Walk in cleene heir, eschewe mystis blake.
>
> Ete nat gret flesh for no greedynesse,
> And fro frutess hold thyn abstinence,
> Poletis and chekenys for ther tendirnesse
> Ete hem with sauce, and spar nat for dispence
> Verious, vynegre and thynfluence
> Of holsom spices, I dar vndirtake,
> The morwe sleep, called gyldene in sentence,
> Gretly helpith ayeen the mystis blake.[159]

Lydgate's poem focused on preventative measures, particularly those involving diet, against plague. Works such as this both provide (mostly) practical advice on staving off the plague that regular people could follow and demonstrate demand for plague writings from the general, non-medically trained but still somewhat educated, public.[160] They would be accessible to anyone who could read and afford to attain them. This popularization favored very practical writings and steered away from esoteric medical texts. Learned physicians did not have control over this process and would need to find a different way to assert their dominance over other medical practitioners and writers.

Regulations and Medical Hierarchy

As their second main response to the plague, physicians, backed by university and also royal and papal authority, depending on the area, worked to regulate medical practices and bring all other medical practitioners, including apothecaries, barber-surgeons, and in northern Europe, surgeons as well, under their control and authority. Attempts of physicians to control other medical practitioners and to weed out the non-licensed are, in fact, not new to the Black Death period, having been occurring since medicine was institutionalized within the university setting.[161] However, the Black Death added new urgency to this struggle, and particularly worked to change the relationship between physicians and surgeons, especially in northern European areas where surgery was not included in the university curriculum. Where as the Black Death presented physicians with a challenge to consolidate their position, it presented surgeons, and others, with a serious opportunity to advance theirs. And thus, the struggle of physicians to control other medical groups intensified.

Barber surgeons, apothecaries, and lay practitioners were relatively easily brought under the control of physicians, at least in areas where university authority was strong or where secular or ecclesiastical authorities cooperated with the wishes of physicians. As previously described, the University of Paris decreed in 1271 that apothecaries and surgeons not attempt to exceed the limits of their crafts, thereby usurping the authority of learned physicians, however this prohibition was, of necessity, limited to those practicing in Paris or its vicinity. Practitioners were to take oaths that they would abide by this statute.[162] It was important to physicians' hopes of dominance that other medical practitioners be subservient to them. This was especially true as regards the apothecaries, for while a physician could, conceivably, simply refuse to have anything to do with surgery or surgical measures, though this was certainly not always the case,

especially in Italian areas, physicians were always dependent upon apothecaries to prepare the medicines which they administered to their patients. Of course, they could have mixed them themselves, and in some places, this did happen, but in general, physicians avoided this alternative because then they would risk a loss of some status through engaging in the manual operation of physically preparing medicines.[163] Thus, the physician was directly dependent upon the apothecary, and as such, desired to control and supervise the apothecary's practices.

In addition to the 1271 proscriptions, from 1322 on, Parisian apothecaries were required take an annual oath before the medical faculty that they would loyally serve their specific trade (apothecary or spicer), that they had at their disposal reference works for their trade that had been approved by the medical faculty, that their weights and measures had been tested, and finally that they would not use corrupted medicines.[164] Soon after, it was added that apothecary shops be subjected to inspection by the medical faculty at least twice a year.[165] In 1422, the administering of the oath was recorded in the university records, demonstrating the longevity of this regulation.

> On the second day of the month of October, the faculty of medicine was called together according to custom by the bedell with a schedule at St. Mathurin concerning two articles. The first was to hear the oaths of the herbalists taken before the entire faculty…. All herbalists existing in Paris had been summoned and swore as follows:
> First, they swore that they will have the *Synonyms* in corrected form and the *Circa instans* of Platearius.
> 2. That they will have better weights just and true from the pound to the scruple.
> 3. That they will not put in their clysters any medicine which has lost its virtue or corrupted.
> 4. That they will not substitute one drug for another in any prescription except by permission of the master giving the prescription, but will adhere strictly to the prescription as given, and if they do not have any herb or drug listed in the prescription, they will refer the matter to the master who ordered it, that he may see about it.
> 5. That they will not give nor knowingly permit to be given any clyster or any other medicament, unless they have a special prescription for it from some master, nor will they take a recipe from his book except, by his special consent, a recipe which he has ordered beforehand.
> 6. That they will not receive prescriptions from any quack or from anyone else unless

> they know that he is a graduate of Paris or another university or is at least approved by the faculty of medicine of Paris.
> 7. That they will not employ a clerk unless he knows how to understand, speak and write Latin and French, and, before they engage him, he shall be required to take all the aforesaid oaths.
> 8. That they will cause all the aforesaid oaths to be inviolably observed to the best of their ability by their wives, messengers, clerks, and footmen.[166]

The medical faculty of Paris also received support from the Pope John XXII in 1325 when he instructed the bishop of Paris to cooperate with the medical faculty's efforts to regulate practice. The purpose of this was to ensure that those unlearned in medical knowledge did not practice within the city of Paris or its vicinities, lest the true physicians lose status and control. This was just one of many instances where the medical faculty of Paris would appeal to papal support. The medical faculty enlisted the aid of secular officials as well, and royal edicts were added to papal decrees, all helping to move physicians to the top of the medical ladder and keep them there.[167]

After the onset of the Black Death, regulatory efforts on the part of physicians, with the backing of the University of Paris and other authorities, continued. In 1352, the king of France, at the request of the medical faculty of the University of Paris, issued a royal ordinance prohibiting the illicit practice of medicine by those without sufficient training. This ordinance covered all untrained practitioners, including medical students whose training was not yet complete.

> John by the grace of God king of the Franks. We make known to all present and future that having heard the humble petition of the dean and masters of the faculty of medicine of the university of Paris, asserting that many persons of both sexes, women and old wives, monks, rustics, some apothecaries and numerous herbalists, besides students not yet trained in the faculty of medicine or coming from foreign parts to the town of Paris to practice, ignorant of the science of medicine and unacquainted with human constitutions, the time and method of administering and the virtues of medicines, particularly laxatives in which lurks peril of death if they happen to be administered unduly, also altering medicines quite contrary to reason and the medical art, administer, prescribe and advise

> the administering of strongly laxative clysters and other things unlawful for them in the city, town and suburbs of Paris, calling into consultation no physicians whatever, which results in scandal of our people, grave danger to souls and bodies, and derision, prejudice and injury of the said petitioners, the science of medicine, and those expert in it. From which undue administrations also result clandestine homicides and abortions on every hand and sometimes publicly. Wherefore the said petitioners, unable further to tolerate the said practices with clear conscience or to wink at them, humbly beseech us that we deign to provide a suitable and lasting remedy for this.
> We, therefore, wishing to prevent such damnable interference, presumption and fatuous rashness of unskilled operators and to provide wholesome, suitable remedies for the public utility of our subjects, ordain and decree by our royal authority and plenitude of power by the present ordinance to hold good in perpetuity that no one, of whatever sex or condition, in the said city, town and suburbs of Paris shall henceforth make, or advise the making, or dare to administer any medicine alterative, laxative, syrup, electuary, laxative pills, clysters of any sort – for fear of death from flux or aggravation of bad symptoms in which it is not likely that they know how to apply a remedy – opiate or anything else, or offer medical advice or otherwise exercise the office of a physician in any way, since the administration of the aforesaid belongs to experts and those learned in operating certainly on the human body and not to others, unless he is a master or licentiate in the said science of medicine at Paris or some other university, or unless that medicine was ordered by the advice and direction of some master or other person approved by the said faculty to practice.[168]

It is reasonable to believe that the purpose of this ordinance was indeed twofold. First, it was meant to protect the people of Paris from being harmed by the practice of those who did not know what they were doing in the field of medicine. Second, it is quite plain that this ordinance was also meant to protect the practices of physicians, stamping out competition that certainly would have charged smaller fees than university trained physicians. Members of the general population had little contact with trained physicians, both because of the fees they charged and because physicians tended to limit their practices to treating upper class patients. Thus, non-licensed practitioners always had a market among regular people, and physicians always had an uphill battle in asserting control over all medical practice.[169]

The situation was similar in universities around Europe. At Montpellier, as at Paris, regulation of medical practices was first undertaken by the university itself, but later was backed

by royal and ecclesiastic powers. Also like Paris, attempts at regulation began in the thirteenth century, and already in 1272, no practitioner was allowed to practice medicine unless he had received a license from the medical faculty of Montpellier. The medical faculty also had rights to inspect, in this case annually, the shops of apothecaries, like those of Paris, and Montpellier's medical faculty sternly warned all apothecaries not to exceed the limits of their stations by attempting to practice medicine themselves.[170]

In English areas, university medical faculties were substantially weaker than those in French areas, yet in the time after the Black Death, they were able to exert enough influence to attempt the stamping out of medical practices they deemed illicit.[171] Royal authorities also stepped in here to aid the universities' (Oxford and Cambridge) efforts, since their jurisdiction was limited in London due to their distances from that major population center. The need for practical treatments for plague helped allow the explosion of medical practitioners, many of whom probably had little, if any training. The medical faculties of England did not have the power and status of those in continental Europe, but they still saw a need to exert as much control as they could to protect, and hopefully elevate, the status of university trained physicians by regulating the practices of those who were not university trained. A series of suits brought against unqualified practitioners in the decades after the Black Death helped convince secular authorities of the need to aid the university medical faculties efforts to regulate practice.[172] In 1421, English physicians petitioned Parliament to outlaw the practice of medicine by those who were not trained. They couched this in a need to protect the populace from unauthorized, untrained practitioners.

> Hey and most mighty Prince, noble and worthy Lordes Spirituelx and Temporelx and worshipfull Commones: for so moche as a man hath thre things to governe, that is to say soule, body and wordly goudes, the whiche ought and shulde ben principally reweled by thre sciences, that ben divinite, fisyk and lawe – the soule by divinite, the body by fisyk,

> wordly goudes by lawe; and these conygnes sholde be used and practiced prinipaly by the most connyng men in the same sciences, and most approved in cases necessaries to encrese of vertu, long lyf and goudes of fortune, to the worship of God and comyn profit. But, worthy soveraines, as hit is knowen to youre hey discrecion, many unconnyng and unapproved in the forsayd science practiseth, and specialy in fysyk, so that in this roialme is euery man, be he never so lewed, takyng upon hym practyse, y suffred to use hit, to grete harme and slaughtre of many men. Where if no man practiced theryn but al only connynge men and approved sufficeantly y lerned in art, filosofye and fisyk, as hit is kept in other londes and roialms, ther shulde be many man that dyeth, for defaute of help, lyve; and no man perysh by unconnyng.
>
> Wherfore pleseth to youre excellent wysdomes that ought, aftre youre soule, have mo entendance to your body, for the causes above sayd, to ordeine and make in statuit, perpetually to be straytly y used and kept, that no man, of no maner estate, degree, or condicion, practyse in fisyk, from this tyme forward, bot he have long tyme y used the scoles o ffisyk withynne som universitee, and be graduated in the same. That is to sey, but he be bacheler or doctour of fisyk, havynge letters testimonyalx sufficeantz of on of those degrees of the universite in the whiche he toke his degree yn, undur peyne of long emprisonement, and paynge of xl li. to the Kyng. And that no woman use the practyse of fisyk under the same payne. And that the sherrefe of the shire make inquisicion in thaire tornes if ther be eny that forfaiteth ayens this statuit, under a pyne resonable. And theme that haz putte this statuit in execucion without any favour, under the same peyne….
>
> Plesith to youre hey prudence, to send warrant to all the sherrefs of Englond that euery practysour in fisyk nought gradeuated in the same science, that wile practyse forth, be withynne on the universities of this lond by a certeine day, that they that ben able and approved, after trewe and streyte examinacion, be received to theyr degree; and they that be nought able to cese fro the practyse in to the tyme that they be able and approved, or never more entremette therof; and therto also be iset a peyne convenient.[173]

As a result of this petition, King Henry V issued regulations prohibiting medical practices conducted by anyone who was not a university medical school graduate, though the prospective physician could have gotten his education at any university medical school, not just at Oxford or Cambridge.[174] Yet, struggles over the regulation of medical practices continued on into the sixteenth century when, in 1512, a further piece of protective legislation was passed by Parliament to restrict medical practices to suitably trained physicians and surgeons.

> Forasmoche as the science and connyng of physyke and surgerie, to the perfecte knowledge wherof bee requisite bothe grete lernyng and ripe experience, ys daily within this royalme exercised by a grete multitude of ignoraunt persones, of whom the grete partie have no maner of insight in the same, nor in any other kynde of lernyng; some also can no letters on the boke, soo far furth that common artificers, as smythes, wevers and

> women, boldely and custumably take upon theim grete curis and thyngys of great difficultie, in the which they partely use socery and which crafte, partely applie such medicyne unto the disease as to be verey noyous, and nothing metely therefore, to the high displeasoure of God, great infamye to the faculties, and the grevous hurte, damage and distruccion of many o fthe Kynge's liege people, most specally of them that cannot descerne the uncunnyng from the cunnyng: be it therefore to the suertie and comfort of all maner people by the auctoritie of thys present Parliament enacted that noo person within the Citie of London nor within vij myles of the same take upon hym to exercise and occupie as a phisicion or surgion, except he be first examined, approved and admitted by the Bisshop of London or by the Dean o fPoules for the tyme being, calling to hym or them iiij doctors of phisyk, and for surgerie other expert persones in that facultie. And for the first examynacion such as they shall think convenient; and afterward always iiij of them that have been soo approved. Upon the payn of forfeytour for euery moneth that they doo occupie as phisicions of surgeons, not admitted nor examined after the tenour of this Acte, of v li., to be employed the oon half therof to thuse of our Soveraign Lord the Kyng, and the other half therof to any person that wyll sue for it by accion of dette, in which no wageour of lawe nor proteccion shalbe allowed.
>
> And over thys, that noo person out of the seid Citie and precincte of vij myles of the same, except that he have been as is seid before approved in the same, take upon hym to exercise and occupie as a phisicion or surgeon in any diocesse within thys royalme but if he be first examined and approved by the bishop of the same diocesse or, he being out of the diocesse, by hys vicar generall, either of them calling to them such expert persons in te seid faculties as there discrecion shall think convenient, and gyffyng ther letters testimonials under ther sealle to hym that they shall soo approve, upon like payn to them that occupie the contrarie to this Acte.[175]

Thus, the efforts of university-trained physicians to exert dominance over other medical practitioners did not meet with immediate success. However, physicians generally found willing accomplices in their efforts in secular and ecclesiastical authorities.

Italian physicians also attempted to exert control over medical practices. At Bologna, the College of Doctors of Medicine put forth regulations prohibiting any practice of medicine by anyone without its permission in 1378, 1395, and 1410. In order to be so approved by the College, one had to have studied medicine for three years under a master who had taught at Bologna or another university. If one had studied medicine outside of Bologna's university, this fact had to be attested to by three witnesses. Additionally, though surgery was also taught at Bologna, and as such was accorded more respect there than in most other places, a graduate in

surgery could only practice that discipline and not practice as a physician in medicine. The Bolognese College also controlled the apothecaries of the area, supervising their practices and approving the sorts of medicines they were allowed to sell.[176]

The situation at Padua was very much the same. Padua's medical faculty attained and guarded the right to examine and approve anyone wishing to practice medicine before he was allowed to do so. Anyone who was approved by the medical faculty could practice both in Padua and in Venice, since Venice received its physicians from that university. Padua also sought to examine and approve those wishing to practice surgery, and university educated surgeons established the College of Surgery, which was separate from the College of Physicians though both disciplines were taught in the university, in order to do this.[177]

In some areas, it was the secular government that took the lead in regulating medical practices instead of simply enforcing what the universities wished. Such was the case in most of southern Italy and Sicily, except within the areas directly under Salerno's influence. Within Salerno, apothecaries were supervised by the medical faculty, but in areas more distant from it, apothecaries, and others, were supervised by royal officials instead.[178] In other areas, the Black Death, and the crisis of public health that it caused, seems to have directly influenced secular authorities to act to enforce medical standards. In Valencia, for example, municipal authorities noted an increase in the level of unlicensed practice within its confines in the aftermath of the Black Death and reacted against what it perceived to be the slackening of medical standards, which it held to be a danger to its population.[179] In 1350, the council decreed that it was dangerous to have irregular medical practices and that all physicians then practicing be examined to determine fitness for practice and that all apothecaries be examined by approved physicians accompanied by two knowledgeable, already approved, apothecaries.[180] The council named its

motive for this decree as care of public health, but it may also be that physicians, who had already been examined and approved by Valencia's extant process, dating from 1329, resented the influx of other practitioners that came after the plague. Physicians cracked down on illicit practices to retain their position at the top of the medical ladder. Thus, though municipal authorities may have originated the practice of examining medical practitioners, the Black Death caused the physicians to have a vested interest in making sure examination procedures were enforced. Apparently, they were successful. Though the control of the apothecaries by the municipality was confirmed in 1403, in 1441, authority over the apothecaries shifted from the municipality to the physicians. The newly formed apothecary guild accepted the supervision, and thus the dominance, of physicians, provided that their body would be able to elect two of its members to the examinations council.[181]

While physicians had at least moderate successes in asserting their dominance over apothecaries and other, unlicensed practitioners, gaining control over surgeons was quite a different, and more difficult, matter. Surgeons, especially ones with some university education, had long resented the pretensions of the physicians and looked for ways to assert and elevate their own positions. One of the first steps in this process came in educated surgeons attempts to distinguish two different kinds of surgery, one a craft and the other a science. Dino del Garbo, a prominent Italian in the first half of the fourteenth century, elaborated upon this distinction. Garbo argued that surgery was a subdivision of practical medicine and came in two forms. The first consisted of manual operations meant to restore health to bodies, and because it only involved manual operations, it was not to be considered a true science, but something more like a craft. The second kind of surgery, however, was the study of how to carry out these manual operations, or more broadly, as the study of curing sicknesses for which a manual operation is

eventually required. Garbo argued that this form of surgery was a science because it relied upon medical knowledge of the body and of the nature of diseases. In this second form, surgery could include treatments using medicines and adjusting diets before manual operations were used.[182] Additionally, other writers such as Guy de Chauliac, attempted to make a similar distinction. According to Chauliac, surgery as a craft was that which could be learned and performed by anyone, even someone who had never worked at it, while surgery as a science was that which could be neither understood nor performed by anyone who had not previously received medical training.[183] In short, some surgery was craft-like, and some surgery required medical training and knowledge. The latter, according to surgeons in that class, ought to be elevated. According to Chauliac, a good, well-trained surgeon was educated in theory as well as practice. He wrote,

> The condiciouns that beth required in the cirurgien beeth foure: the ferste is that he be a lettred man; the secounde, that he be expert or cunnynge; the thridde, that he be witty or wise; the fourth that he be wel-thewed.[184]

Concerning the first requirement, that the surgeon be a learned man, Chauliac went on to say,

> It is firste therefore required that the cirurgien be a lettred man, noght onliche in the principles of cirurgie but also of physique, als wel in theorique as in practique. In theorique it byhoueth that he knowe kyndely thinges and noght kyndely and thinges aghenst kynde. First forsothe it byhoueth that th knowe kyndely thinges, nameliche anothomye, for withoute it nothing is imade in cirurgie, as it shall be schewed ynnermore. Knowe he also the complexioun, for after the dyuersite of kynde of bodies hit byhoueth to dyuerse the medicine. And that same thing is proued of vertue, agayne Thesil, in all Terapeutice. It byhoueth also that he knowe thing noght kyndeliche, as beeth aer, mete and drynk, for these beeth the cause of al the sekenesse and of helthe. It byhoueth also that he knowe thines that beeth aghenst kynde and moreouer that he knowe the seeknesse, for of that is taken properly the entente of curing. He schulde noght unknowe the cause in no manere, for if he schulde cure withoute knowleche therof, it were noght of his gifte but of fortune. Leue he not of the accidentis, or thinges longynge therto, for thai ouercome vnwhile his casue, and thai trespasse aghen and turne vp-so-down al the cure, in primo Ad Glauconem.[185]

In this statement, Chauliac echoed the teachings of Galen. Reason, or theory, and experience

were both important, but reason was most important because it taught the reasons why a cure worked, while curing by experience was almost as if one cured by accident. Thus, Chauliac, like other learned surgeons, did not wish to throw out the system of medical theory on which physicians were so dependent. Instead, it was to be supplemented by experience, knowledge of anatomy, and surgery. Practical knowledge was indeed very important, since surgery, though properly to be based on theory, involved a great deal of practice. A surgeon who did not know anatomy and have skill in performing manual operations would not be of any help to a patient.

> Cirgurugiens not knowynge anathomye synnen ofte tymes in kyttynges of synowes and of fastnynges togidres. But thou, konnynge the kynde of eueriche lyme, ghit forsothe thow schalt knowe redily the drynkes and the plastrynges that thai hauen in all the body and after eueriche membre, when it schal happe a wounde to be made in it, if a synowe is kutte or a thenoun or a festnyng togedre. Thus ledeth Henry of Hermondavilla by resoun in the firste book of his Cyrurgie: Euery werkman is iholden to knowe the subiecte in the whichi he wircheth, and ellishe erreth in wirchynge. But a cirurgien is a werkman of the helthe ofmanis body; therefore he is holden to konne the kynde of composicioun of it. And by this manere resoun, he is holden to konne anothomye. But the blynde man kyttynge the tree ofte tymes, forsothe as it were alwey, he erreth in taking vppon hym more or lasse than he schulde, perfore in the same wise a cirurgien when he can not anothomye. Suche cirurgiens beth at the liknesse of euel cokes, to whiche Galien seide in 2° Terapeutice, which kut noght after the particles or members, but thai foulen or renten, breken or frusshe, and throwen oute.[186]

Thus, theory should be combined with practice, and surgeons that embodied this ideal, should receive more prestige and higher status within the medical hierarchy.

Even before the Black Death, in certain areas, surgeons had begun to organize themselves into guilds. In Paris, surgeons had, in an effort to preserve what power they had in the face of a growing university system, organized in this way in the mid thirteenth century. Within their own organizations, the regulated surgical practices, requiring that all surgeons practicing in Paris be examined and approved by the master surgeon and an examination board of six surgeons.[187] Yet, surgeons were not content with their guild structure and aspired to something higher, especially

after the Black Death revealed the impotence of traditional medical learning and the need for practical solutions. In turning to royal support, they achieved some success in organizing their own college, being declared a faculty in 1356, though this was not part of the University of Paris itself. By 1370, the faculty of surgeons was allowed to grant the degrees of master, licentiate, and bachelor of surgery.[188] They wanted to demonstrate that they were, indeed, learned medical practitioners and not craftsmen, but because they were still lumped with the more craftsmen-like segments of surgery, namely, the barber surgeons, there was a need to distinguish surgery as a true science even more.

In order to push the distinction between educated surgeons and other practitioners, educated surgeons took several actions. First, they imitated the symbols of physicians, such as wearing long robes.[189] They also increasingly emphasized writing and book learning as part of their training and required all students in surgery to know Latin, hoping that this would help highlight their similarities with learned physicians and their differences with other medical groups more distinct.

Another offshoot of surgeons' attempts to boost the status, and popular image, of their practices was to write about and develop standards of proper behavior, attire, and demeanor for medical practitioners. The image of doctors was tarnished by the Black Death, wherein some fled and others greatly inflated their rates while not really providing any help, and generalized greed and ineffectiveness. Overall, many people seemed to have viewed physicians in a negative light. Writings, such as that produced by John Arderne, sought to counter negative images and tarnished reputations. He counseled that surgeons control their behavior and demeanor in some of the following ways:

> ffirst it bihoueth hym that wil profite in this crafte that he sette god afore euermore in all his werkis, and euermore calle meekly with hert and mouth his help; and som tyme visite

> of his wynnyngis poure men aftir his might, that thai by thair prayers may gete ym grace of the holy goste. And that he be noght y-founden temerarie or bosteful in his sayings or in his dedes; and abstene he hym fro moche speche, and most among grete men; and answere he sleighly to thingis y-asked, that h be noght y-take in his wordes. fforsoth ghit his serkes be oft tyme knowen for to discorde fro his wordes and his byhestis, he shal be halden more vnworthi, and he shal blemmyssh his oone gode fame….Also be a leche noght mich laughing ne mich playing. And als moche as he may withoute harme fle he the felawshippe of knafes and of vnueste persones. And be he euermore occupied in thingis that biholdith to his crafte; outhir rede he, or studie he, or write or pray he; for the excercyse of bokes worshippeth a leche. ffor why; he shal both byholden and he shal be more wise. And aboue al eth to hym that he be founden euermore sobre; ffor dronkennegh destroyeth al vertu and bringith it to not…[190]

He also advised doctors on their dress and manners when speaking.

> Also dispose a leche hym that in clothes and other apparalyngis be he honeste, noght likkenyng himself in apparalyng or berying to mynistrallegh, but in clothing and beryng shew he the maner of clerkes. ffor why; it semeth any discrete man y-cladde with clerkis clothing for to occupie gentil mennegh bordes.
> Haue the leche also clene handes and wele shapen nailes and clensed fro all blaknes and filthe. And be he curtaise at lordes bordes and displese he noght in wordes or dedes to the gestes syttyng by; here he many thingis but speke he but fewe….
> And whan he shal speke, be the wordes short, and, als mich as he may, faire and resonable and withoute sweryng.
> Be war that ther be neuer founden double worde in his mouthe, ffor ghif he be founden trew in his wordes ffewe or noon shal doute in his dedes.[191]

In general, surgeons were to inspire confidence by the way they behaved, carried themselves, dressed, and spoke. He should never do or say anything that would disgrace himself or his occupation.

Prior to the Black Death, physicians seldom, if ever, produced writings concerning the behavior and appearance of doctors. But, with the Black Death, it became necessary to repair the image of medical practitioners, and the surgeons took the lead on this. Perhaps they saw it as an opportunity to promote themselves above other medical practitioners by appearing more professional and being careful about their dress and their attitudes. If they could be collectively more presentable as a group, this could aid them as they challenged the superiority of physicians.

The final way in which surgeons hoped to elevate themselves involved, again, the distinction between speculative and manual practices. If surgeons truly wanted to compete with physicians for prestige and status, they would have to make their practices more speculative and less manual, and they attempted to do this by distinguishing worthy surgical tasks from unworthy ones.[192] The worthy ones, surgeons would perform; the unworthy ones would be left to the barber surgeons. Yet, in practice, this did not work out well, and barber surgeons began to usurp large chunks of all surgical practices. Additionally, physicians often supported the efforts of barber surgeons, since they found them easier to control and more willing to accept the authority of the physicians.[193] Thus, in their efforts to be more like physicians at a time when, after the Black Death, practical medicine was on the rise and theoretical medicine on the relative decline, surgeons found that they were quickly being squeezed out in favor of barber surgeons.

The response of the surgeons was to press for restrictions on the barber surgeons and other practicing surgery without having been approved, and in 1372, the king issued a royal decree restricting the practices of the barber surgeons within Paris and its vicinity. According to this decree, barber surgeons were only allowed to prepare and administer plasters, ointments, and other medicines to be used in healing boils, tumors, bruises, and open wounds. This legislation allocated more practices to the barber surgeons than the surgeons had wanted, but as they, again mirroring the physicians, tended to restrict their practices to upper class patients, the secular authorities refused to further restrict barber surgeons as it would, in the end, only harm the general populace.[194]

Barber surgeons were the ones who really benefited from this struggle between physicians and surgeons. They, unconcerned with status and professional image, gladly accepted tasks now shunned by both physicians and surgeons, and were supported by physicians as they

sought to weaken surgeons as a threat to their power. Additionally, in the fifteenth century, barber surgeons began to receive more training in anatomy and learn some surgery through hearing lectures on the discipline, all condoned by physicians. This helped barber surgeons to compete with surgeons, and also strengthened the position of physicians as patrons of, and in authority over, them.[195] Yet, while physicians could attempt to weaken the surgeons, they could not truly bring them directly under their control.

In England, surgeons also sought to organize themselves into independent groups. In 1368, they were able to appoint three surgeons as Master Surgeons of the city of London and gained the right to supervise surgery therein.[196] The shift toward practical medicine after the Black Death along with the fact that the surgeons did not have to confront a strong organization of physicians head on, as London had no university, seems to have helped in this achievement. Additionally, English surgeons seem to have had fewer pretensions of achieving equality with physicians, and instead, focused chiefly on restricting and controlling barber surgeons. In 1409, the barber surgeons of London petitioned Parliament complaining that the surgeons were unfairly restricting their own rights. The secular authorities responded by upholding the barber surgeons' right to shave, cut, bleed, and perform any other task within the craft of surgery, thereby hindering the attempts of English surgeons to elevate themselves and control the practices of others.[197]

In Italian areas, the position of surgeons within the medical hierarchy seems to have changed little from pre-Black Death to post-Black Death times. Despite the fact that surgery was included in the medical schools of universities, physicians always remained dominant, with surgeons and apothecaries under their leadership.[198] Perhaps because surgery was already accorded a respected place in the Italian medical hierarchy, this status helped reduce conflict

among the various groups of medical practitioners.

The period after the Black Death saw an increase in efforts to regulate medical practices and an increase in the struggles among various groups of medical practitioners. Physicians advocated these measures in an effort to retain their medical dominance, which had suffered a blow from the staggering mortality of the Black Death and subsequent plague outbreaks. The scramble for effective treatments provided an opportunity for almost any would-be practitioner with an idea to peddle his remedies among a willing and desperate populace. Theoretical, speculative medicine had been shown as ineffective, and the reason to trust a university-trained physician over any other medical practitioner became less compelling. Also, those of the lower segments of society were not likely to ever have access to a university-trained physician anyway. Thus, surgeons and other more practical medical practitioners were given a chance to improve their positions in the medical hierarchy. However, as surgeons sought to make themselves more like speculative physicians, barber surgeons stepped in to assume many practical medical responsibilities. Though the Black Death was not the only reason that surgery and practical medicine rose in prominence, it combined with other factors, especially warfare, as nobles increasingly brought trained surgeons with them onto the battlefield to treat the wounded, to create an environment wherein practical medicine and surgery were progressively more valued.

University Education

In the time after the Black Death, several university medical schools also experienced some changes, though these were not immediate and not always very extreme. Historians of the history of medical education have detailed these changes before, and few if any of them relate the changes to the Black Death or any other external factor, such as the Hundred Years' War. Yet, certainly, a massive and deadly plague would have some effect on medical education,

especially as outbreaks of plague revisited European areas periodically and continued to claim large numbers of victims even if the numbers were not always as large as in the original Black Death. Perhaps external factors, such as the Black Death and the Hundred Years' War served to accelerate changes that were already underway in the universities. Subjects such as surgery and anatomy would have eventually been included in the medical curriculums of all universities anyway, and that dissections on human cadavers for the purposes of teaching would have been carried out everywhere in the end, but it is possible that the Black Death, and the need for practical, empirical medicine that it generated, ushered these developments into some universities faster than would have otherwise happened.

At Paris, the changes were rather slow to come. A new list of text books used in the medical curriculum appeared in 1395, and in it are exhibited several changes from the list of required texts provided over a century earlier. The 1395 list included several works of the later Muslim physicians, such as the *Canon* of Avicenna, the *Colliget* of Averroes, and the *Continens* of Rhazes.[199] Also included in this list were the *Antidotarium clarificatum* of Nicholas Myrepsus, *De simplicibus medicines* and *De practica* of Mesuë the Younger, *Clavis sanationis* of Simon Januensis, the *Concordantiae* of Petrus de Sancto Floro, the *Concordantiae* of Johannes de Sancto Armando, the *Antidotarium* of Albucasis, and several works of Galen.[200] Within this list, the influence of Muslim writers is clear, and the university seems to have replaced its dependence on translations of Muslim works produced earlier by Salernitan physicians with newer ones. Additionally, several of the non-Muslim works listed were newer, being produced from the thirteenth century onward.[201] Yet, much the same information was conveyed in these works as in the ones from the earlier list of texts since Galen's works were still heavily represented and many of the other works, such as Avicenna's *Canon,* were based on a

Galenic system of medicine or even were commentaries upon Galen's work.

Surgery remained outside of the curriculum at Paris throughout the fourteenth century, though it continued to be taught outside the university in the college set up by the surgeons themselves.[202] Yet, later, in the fifteenth century, it seems that surgeons could be recognized as true scholars by the University of Paris' medical school, as is evidenced by the granting of this privilege in response to a petition made by several surgeons of Paris requesting this in 1436.

> We make known that to us gathered solemnly to transact among ourselves difficult business the venerable man, John de Subfurno, master in arts and surgery, both in his own name and those of the discreet men, Dionysius Palluau, John Perricardi, Adam Martini, John Gileberti, Geoffrey Serre, Roger Ernoult, Dionysius de Lens, and Peter Peuple, masters of Paris approved in the science and art of surgery at Paris by those in charge of examinations and approbations, and true scholars in our university of Paris, set forth that, contrary to the public good, many quacks have arisen, not approved, and false or feigned surgeons, greatly disturbing and cheapening the venerable science of surgery with grave and horrid popular scandal and injury to the same. Which also seems to redound to the prejudice and no small detriment of the said petitioners, in view of the great and notable privileges conceded and bestowed by many kings of France upon the same petitioners and their predecessors in the said science of surgery, to wit, that no persons may practice surgery in the town or viscounty of Paris or exercise the function of a surgeon, unless they have been previously diligently examined and approved by the *jurati* of our lord the king in his Châtelet at Paris and the provost of the surgeons, or whatever they may be called, as he said was more fully set forth in their said privileges. That same master, John de Subfurno, begged in the name of those mentioned, that the aforesaid surgeons and others duly approved in the future in the art of surgery, be reputed scholars and enjoy their privileges, franchises, liberties, and immunities conceded to us or to be conceded, and that we aid them in this.
>
> We, moreover, after mature and long deliberation over the aforesaid matters, held in the manner accustomed, have conceded and do concede the petition of the aforesaid surgeons, provided that they attend the lectures of the masters at Paris teaching in the faculty of medicine, as is customary.[203]

Thus, Parisian surgeons, at least those who had been examined and approved, were accorded the distinction of being called scholars of the university, though it is interesting that they were then required to attend lectures on medicine.

Anatomy similarly lagged behind in the curriculum and was not even officially part of it

when the first dissection was conducted, an autopsy of the bishop of Arras meant to determine the cause of his death and thus save the Duke of Burgundy, who apparently had the same ailment, in 1407.[204] Though more dissections were done after the autopsy of the bishop, they were done irregularly and not as part of any official curriculum, though they may have been used to help teach barber surgeons anatomy. In any case, official, university-sanctioned, and open dissections were not performed by the medical faculty on anything like a regular basis until 1494.[205] Though it did not occur quickly, and seemingly, the university resisted any change that made it more empirical and less speculative, eventually, surgery, anatomy, and dissections were all included in the medical school of the university.

At Montpellier's medical school the chief changes in medical education after the Black Death were the increase in the number of dissections carried out and the establishment of a college at Montpellier specifically for medical students. With regard to dissections, in 1376, Duke Louis of Anjou allowed the medical faculty to use the bodies of executed criminals for dissections, thereby allowing for an increase in the number and frequency of dissections. In 1377, Charles the Bad repeated the order for officials to deliver bodies to the university for dissection, as apparently, the university was having trouble in actually acquiring the corpse necessary for dissection. And finally, in 1396, Charles VI, again ordered bodies to be delivered.[206] How many dissections actually occurred and how often they occurred is not known. Yet, even if bodies were not delivered regularly, as seems likely from the repeated royal orders, it is still important that the university desired to obtain them and complained when they did not. The medical faculty had accepted dissections as a valuable tool for obtaining practical medical knowledge, thus, by at least the end of the fourteenth century.

Also near the end of the fourteenth century, Pope Urban V established a college at

Montpellier specifically for students of medicine in 1369. It allowed for twelve students to study medicine and provided monetary assistance to them if they were able to meet its requirements. It was commonly called the *Collège des Douze Médecins,* and in order to qualify for entry, one had to be a native of the Diocese of Mende, perhaps in an attempt to provide more physicians for that area.[207]

The position of surgery at Montpellier remained somewhat ambiguous in the time after the Black Death. Surgery had been taught for some time, but its teachers generally remained outside of the university structure, and no degrees specifically in surgery were granted. Yet, evidence of surgeons being members of the medical faculty does exist, as when Charles VI forbade anyone from practicing surgery that had not been examined and approved by a group of masters in 1399, surgeons who were members of the University of Montpellier's medical faculty were exempted.[208] Evidently, being a member of the Montpellier's medical faculty was proof enough that one was qualified to practice surgery.

At the University of Padua, the post-Black Death period seems to have resulted in an enlargement of the medical faculty and its division into two branches, one to teach theory and the other to teach practice. By 1391, lectures in practical medicine are recorded, and statutes from the fifteenth century, stipulate that separate groups of professors, one of theory and the other of practice, be appointed.[209] Doctorates and licentiates were granted in surgery at Padua, and university-educated surgeons were accepted there by physicians as colleagues.[210]

Dissections of human cadavers also began to be held regularly at Padua during the fifteenth century. It is likely that they had been conducted before the Black Death, but then, only in special cases and not regularly for the purposes of education.[211] Padua was certainly influenced by Bologna, where dissections had already been occurring, and Venice, where the

council had decreed in 1368 that annual dissections be held and that both surgeons and physicians be able to attend.[212] The first definitive record of a dissection at Padua occurred in 1446. Additional statutes of the university in 1465 stipulated that one dissection be held every year. During these dissections, one participant was to read the *Anatomia* of Mondino de' Luzzi while another pointed out the portions described in the text on the corpse.[213]

At the University of Bologna, surgery was already part of the curriculum and dissections were already conducted before the Black Death. Though statutes governing the procedures for dissections, who was allowed to attend and how often, were laid out in 1405, it is likely, as was described above, that they had been occurring well before that date, even if infrequently. Perhaps they were held more regularly in the time after the Black Death.

The curriculum at Bologna was apparently fuller and more diversified than at most other medical schools. Lectures were given in medicine, in practice, and in surgery, and in 1439, additional lectures were added in the practice of medicine in both morning and evening slots. According to some, this may indicate an increased demand for practical courses.[214] The statutes of 1405 provide information as to the course of study, over four years, that a prospective physician undertook, giving evidence of what medical students were required to learn in their studies. The statutes give both the ordinary (morning) and extraordinary (afternoon) lectures for what was probably the entire course of study for a new student who entered already possessing a licentiate in the arts.[215]

In the first year of study, the ordinary lectures were to on the first book of Avicenna's *Canon,* "except the Anatomy and chapters on the seasons of the second fen, and only these chapters of the third fen: The Necessity of Death, Diseases of Infants, What to Eat and Drink, As to Water and Wine, Sleep and Waking;" and Galen's works of *De differentiis febrium, De*

complexionibus, De malacia complexionis, De simplici medicina (except book VI), and *De diebus criticis,* book I. The extraordinary lectures were to be on book IV, fen 2 and book II of Avicenna's *Canon*; Galen's *De interioribus* (except book II), *De regimine sanitatis,* and *De diebus criticis,* book II; and the *Aphorisms* of Hippocrates except for the seventh Particula.

In the second year, ordinary lectures consisted of the *Tegni* of Galen; Hippocrates' *Prognostics,* without commentary and *De regimine acutorum,* also without commentary and omitting the fourth book; and Avicenna's *De viribus cordis;* followed by more works of Galen, *De accidenti et morbo, De crisibus, De diebus criticis,* book III, *De febrisbus ad Glaucho,* tract I, *De tabe,* and *De utilitate respirationis.* Extraordinary lectures consisted of a repeat of the parts of the *Canon* given in year one's ordinary lectures, along with book VI, fen II of the same work, Galen's *De differentiis febrium, De malacia complexionis, De simplici medicina* (except book VI), and *De diebus criticis,* book I, again.

The third year's ordinary lectures began with Hippocrates' *Aphorisms,* minus the seventh Particula; followed by the *Therapuetics* of Galen, books VII through XIII; the *Colliget* of Averroes, in part; and concluded again with Galen's works, *De simplici medicina, De virtutibus naturalibus*, both in part, and *De diebus criticis*, book II. Extraordinary lectures were repeats of most of the ordinary lecture of the second year, consisting of the Tegni, Prognostics, *De regimine acutorum,* parts of *De viribus cordis, De accidenti et morbo, De crisibus, De febrisbus ad Glaucho,* tract I, and *De complexionibus.*

Finally for the fourth year, ordinary lectures were given on the same parts of the *Canon* as in the first year, as well as book IV, fen I and book II; Galen's *De interioribus,* except book II and *D regimine sanitatis;* and Hippocrates' *De natura*. Extraordinary lectures were given on *Aphorisms,* except the seventh Particula, *Therapeutics,* books VII through XIII, parts of the

Colliget, and parts of *De virtutibus naturalibus.*[216]

It is clear from this course of study that, though Bologna was known for its innovation and for allowing the teaching of anatomy and surgery, the study of a physician of medicine remained heavily reliant on the works of Galen, with some of those of Hippocrates and Avicenna and Averroes included as well. Therefore, Bolognese physicians would still be steeped in the knowledge of humoral theory, theories of disease causation, and methods of prevention that had been traditional for hundreds of years. Yet, because relatively few works were intensively studied, and because so many lectures were repeats, the more able students at Bologna, those who grasped the material and quickly advanced, would have ample opportunity to study other subjects as well, particularly astrology and surgery.[217] Thus, this course of study may have been a benefit in that the more capable students would also then study aspects of medical practice outside of a typical, northern physician's reach.

The 1405 statues also outlined the way in which surgery should be taught at Bologna, which demonstrate the course of study for surgery students and also what was expected of the masters who taught it.

> Further, they decreed that the doctors lecturing on surgery ought to lecture in the following way: namely, that every year, when the university opened, they begin in the first course of lectures to read the Surgery of Bruno and, after finishing it, lecture on the Surgery of Galen. For the second course, lecture first on the Surgery of Avicenna and after it the seventh book of Almansor. Moreover, each doctor giving ordinary lectures in surgery should lecture in the afternoon at the nineteenth hour.
> Further, they decreed that points in surgery should be determined by another of the doctors lecturing in surgery, namely, so many points as a assigned in other sciences. And that each doctor giving lectures observe the points assigned and complete and cover them as assigned under penalty of twenty solidi Bolognese for each offense. Also, each doctor lecturing in surgery is held to dispute two questions in surgery, and even more, just as the doctors lecturing in medicine are held to do; and also he is held to give them in final form in good writing and on good paper to the office of the general bedells to be preserved there permanently and guarded and kept by the bedells. He ought to hold these disputations in the afternoon, unless some feast day occurs during the week on which he might dispute in the morning, provided a lecturer in medicine was not disputing then.

> Moreover, he is required to dispute only in surgery and in surgical terms, under pain contained in the statutes. Further, that no one shall presume to assist in any academic function, while the doctors of surgery are disputing, and that the rector and doctors lecturing in medicine shall be required to attend their disputations the same as others, and to be there from start to finish, and to take part in the arguing just as at other disputations, under pain of twenty solidi for each offender. Likewise, that each doctor lecturing in surgery shall be required to fulfill all the requirements of other doctors in other sciences. Moreover, they shall have for their labor and salary twenty solidi Bolognese from everyone attending their lectures in that subject, under penalty for each of the said doctors who offends in the aforesaid matters or any one of them of five pounds Bolognese in each of the said cases and for each offender.[218]

It is interesting to note that surgery lectures and disputations were held in the afternoons, while medical lectures were held in the mornings, the time slot of more importance. Additionally, with any scheduling conflict, deference was given to the professors of medicine. Thus, though surgery had a special place at Bologna and a higher status there than any where else, it was still subordinated to medicine in some ways, even though the Black Death and subsequent plagues had made the need for practical medicine more pressing than ever.

Chapter 5: Conclusion

The Black Death has an interesting and complex place in the history of the development of medicine and medical practices in Europe. In existing scholarship, it is usually placed at one or another extreme. Some highlight it a the most pivotal and catastrophic event both of Europe's history as a whole and the development of medicine, arguing that it destroyed the existing system of medicine and set it on an entirely new course that would ultimately result in the Scientific Revolution of the seventeenth century. Others all but omit it from the record of medicine's development. It is difficult to imagine a work on medieval medicine and medical education that does not treat the Black Death at all, yet this is something of the norm in histories of European medicine and education. In reality, the Black Death's position in the history of the development of medicine is somewhere in the middle of these extremes, and this position deserves more attention by scholars. The Black Death was probably not responsible for every change in medicine that occurred after it, and yet it was not inconsequential to medicine's development. The Black Death did reveal real weaknesses in European medicine. It demonstrated that the medical theories, handed down for centuries and, by the thirteenth century, ensconced and solidified in universities across Europe, were insufficient in dealing with such a cataclysmic pandemic, and that the need for practical medical solutions, based more on curative measures and less on theories of causation, was indeed very pressing. The Black Death initiated a flurry of writings, at first focused on causation and prevention, but quickly refocused on further prevention and curative measures, and, causing a push for practical medicine, allowed for the intensification of existing struggles between speculative physicians and more practical surgeons. As new plague epidemics continued to course periodically through Europe, practical medicine was further elevated as theories of causation became increasingly irrelevant in the face of a

crushing need to treat plague patients and alleviate suffering. Yet, theoretical, speculative medicine, based on the existing systems of Hippocrates and Galen, did not come crashing down. Medical education in universities remained heavily dependent upon them, even while the more practical studies of medical practice, surgery, and anatomy were gradually included where they had been left out before and intensified where they already existed. Many of the changes in medicine that occurred after the Black Death had already begun before. Learned medicine never completely separated itself from practice, surgeons already struggled with physicians for status, and certainly practical surgery and anatomy would have eventually been taught in every university. Yet the Black Death accelerated these changes in a way that would probably not have occurred otherwise. It, along with the Hundred Years' War, highlighted the need for practical measures and provided the opportunity for surgeons to assert themselves as the best qualified to embody both the theory of learned medicine and the practice of surgery, and it provided an impetus for such practical studies to be further included and elevated within universities. The Black Death deserves a place of importance in the story of the history of European medicine because, though change was slow in some areas, it did eventually force a reassessment of all aspects of medicine, one wherein practical medicine received more attention, study, and status.

Notes

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[2] Di Tura, Agnolo, "The Black Death in Siena," 281.

[3] Boccaccio, *The Decameron,* trans. M. Riggs [database online] (London: David Campbell, 1921, accessed 16 March 2009); available from The Medieval Source Book; Internet; 5-11.

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[6] Anna Montgomery Campbell, *The Black Death and Men of Learning* (New York: Columbia University Press, 1931), 146-180.

[7] Campbell, *The Black Death and Men of Learning,* 179.

[8] Campbell, *The Black Death and Men of Learning,* 32.

[9] Campbell, *The Black Death and Men of Learning,* 33.

[10] Robert Gottfried, *The Black Death: Natural and Human Disaster in Medieval Europe* (New York: The Free Press, 1983), 128.

[11] David Herlihy, *The Black Death and the Transformation of the West,* edited and with an introduction by Samuel K. Cohn Jr. (Cambridge: Harvard University Press, 1997), 71.

[12] Herlihy, *The Black Death and the Transformation of the West,* 71-72.

[13] William McNeill, *Plagues and Peoples* (New York: Anchor Books, 1998), 194-195.

[14] McNeill, *Plagues and Peoples,* 195-196.

[15] Samuel K. Cohn Jr., "The Black Death: End of a Paradigm," *The American Historical Review* 107, no. 3 (Jun., 2002): 707.

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[23] Vern L. Bullough, "Status and Medieval Medicine," *Journal of Health and Human Behavior* 2, no. 3 (Autumn, 1961): 206.

[24] Bullough, "Status and Medieval Medicine," 205.

[25] Bullough, "Status and Medieval Medicine," 209.

[26] On the university at Paris, see Vern L. Bullough, "The Medieval Medical University at Paris," *Bulletin of the History of Medicine* 31, no. 3 (1957): 197-211; on the university at Montpellier, see "The Development of the Medical University at Montpellier to the end of the Fourteenth Century," *Bulletin of the History of Medicine* 30 (1956): 508-523, and "The Teaching of Surgery at the University of Montpellier in the Thirteenth Century," *Journal of the History of Medicine* 15 (1960): 202-204; on the university at Bologna, see "Medieval Bologna and the Development of Medical Education," *Bulletin of the History of Medicine* (1958): 201-215; and on Oxford, see "Medical Study at Medieval Oxford," *Speculum* 36, no. 4 (Oct., 1964): 600-612.

[27] See Hastings Rashdall, *Universities of Europe in the Middle Ages*, ed. F. M. Powicke and A. B. Emden, 3 vols. (Oxford: Clarendon Press, 1936).

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[38] For a brief but helpful breakdown of these groups, see Gottfried, *The Black Death*, 107-109.

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[42] Lindberg, *Western Medicine,* 125-126.

[43] Galen, *On the Therapeutic Method,* (trans. R.J. Hankinson in *Galen on the Therapeutic Method Books I and II* [Oxford: Clarendon Press, 1991]), II.4.17.

[44] Galen, *On the Therapeutic Method,* II.4.17.

[45] Galen, *On the Therapeutic Method,* I.3.14.

[46] Galen, *On the Therapeutic Method,* I.3.14.

[47] Galen, *On the Therapeutic Method,* II.5.1.

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[49] Galen, *On Medical Experience,* (trans. R. Walzer in *Galen on Medical Experience* [London: Oxford University Press, 1946]), I.I.

[50] Bullough, "The Teaching of Surgery at the University of Montpellier in the Thirteenth Century," 204.

[51] Bullough, *The Development of Medicine as a Profession,* 82.

[52] Gottfried, *The Black Death,* 108.

[53] Vern L. Bullough, "Education and Professionalization: An Historical Example," *History of Education Quarterly* 10, no. 2 (Summer, 1970): 164.

[54] Gottfried, *The Black Death,* 109.

[55] Vern L. Bullough, "Status and Medieval Medicine," *Journal of Health and Human Behavior* 2, no. 3 (Autumn, 1961): 204-205.

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[60] Hastings Rashdall, *Universities of Europe in the Middle Ages,* ed. F. M. Powicke and A. B. Emden, vol. 1 (Oxford: Clarendon Press, 1936), 76.

[61] Rashdall, *Universities of Europe,* vol. 1, 82-83.

[62] Rashdall, *Universities of Europe,* vol. 1, 77.

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[69] Gottfried, *The Black Death,* 107.

[70] Bullough, “Medieval Bologna and the Development of Medical Education,” 201.

[71] MacKinney, “Medical Education in the Middle Ages,” 854.

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[80] Bullough, "The Development of the Medical University at Montpellier," 511-512.

[81] Bullough, "The Development of the Medical University at Montpellier," 512.

[82] Bullough, "The Development of the Medical University at Montpellier," 516.

[83] Bullough, "The Development of the Medical University at Montpellier," 521-522.

[84] Bullough, "The Development of the Medical University at Montpellier," 522.

[85] Bullough, "The Development of the Medical University at Montpellier," 522-523.

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[96] D'Irsay, "Teachers and Textbooks of Medicine in the Medieval University of Paris," 235.

[97] D'Irsay, "Teachers and Textbooks of Medicine in the Medieval University of Paris," 236.

[98] D'Irsay, "Teachers and Textbooks of Medicine in the Medieval University of Paris," 236.

[99] Bullough, "The Medieval Medical University at Paris," 202-205.

[100] Bullough, "The Medieval Medical University at Paris," 210.

[101] *Chartularium Universitatis Parisiensis,* I, 488-490.

[102] *Chartularium Universitatis Parisiensis,* I, 488-490.

[103] Bullough, "The Medieval Medical University at Paris," 210.

[104] Bullough, "The Medieval Medical University at Paris," 210.

[105] Bullough, *The Development of Medicine as a Profession,* 74.

[106] Bullough, *The Development of Medicine as a Profession,* 74.

[107] Bullough, *The Development of Medicine as a Profession,* 75. See also John Herman Randall, *The School of Padua and the Emergence of Modern Science* (Padua: Editrice Antenore, 1961), 24-26.

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[127] Bullough, "Status and Medieval Medicine," 209.

[128] Campbell, *The Black Death and Men of Learning,* 36.

[129] Campbell, *The Black Death and Men of Learning,* 15. See also Seraphine Guerchberg, "The Controversy Over the Alleged Sowers of the Black Death in the Contemporary Treatise on Plague," in *Change in Medieval Society,* ed. Sylvia L. Thrupp (New York: Appleton-Century-Crofts, 1964), 210 and Dorothea Waley Singer, "Some Plague Tractates," *Proceedings of the Royal Society of Medicine* 9 (1916): 178.

[130] Campbell, *The Black Death and Men of Learning,* 15-16.

[131] Guerchberg, "The Controversy," 210.

[132] Guerchberg, "The Controversy," 210.

[133] Campbell, *The Black Death and Men of Learning,* 40.

[134] Medical Faculty of the University of Paris, *Compendium de Epidemia, Book 2, 1348,* in H. Emile Rebouis, *Etude Historique et Critique Sur la Pest,* trans. Jeffrey Williams (Paris: Picard, 1888), 95-105. In Joseph P. Byrne, *The Black Death,* Greenwood Guides to Historic Events of the Medieval World, ed. Jane Chance (London: Greenwood Press, 2004), document 4, 159.

[135] Medical Faculty of the University of Paris, *Compendium de Epidemia,* 159-161.

[136] Medical Faculty of the University of Paris, *Compendium de Epidemia,* 160-161.

[137] Medical Faculty of the University of Paris, *Compendium de Epidemia,* 161.

[138] Campbell, *The Black Death and Men of Learning,* 15.

[139] Campbell, *The Black Death and Men of Learning,* 19-21, 39.

[140] Abu Ja'far Ahmad ibn 'Ali ibn Khātimah, *Morbi in posterum vitandi Descriptio and Remedia,* trans. Patrick Gann of Taha Dinānah, "Die Schrift Ahmed ibn 'Ali ibn Mohammed ibn 'Ali Hātimah aus Almeriah über die Pest," *Archiv für Geschicte der Medizin* 19 (1927): 34-38. In Joseph P. Byrne, *The Black Death,* Greenwood Guides to Historic Events of the Medieval World, ed. Jane Chance (London: Greenwood Press, 2004), document 3, 155-158.

[141] Campbell, *The Black Death and Men of Learning,* 87-88.

[142] Campbell, *The Black Death and Men of Learning,* 90.

[143] Campbell, *The Black Death and Men of Learning,* 9-12.

[144] Campbell, *The Black Death and Men of Learning,* 37.

[145] Campbell, *The Black Death and Men of Learning,* 11.

[146] Gentile da Foligno, *Consilium contra pestilentiam,* MS in Med.-Laur. Library, Plut. 90 *supra* Cod. 90, fol. 65r-65v; quoted in Campbell, *The Black Death and Men of Learning,* 37-38.

[147] Campbell, *The Black Death and Men of Learning,* 89-92.

[148] For more information regarding the known tractates not specifically discussed in this work, see Campbell, *The Black Death and Men of Learning,* chapters II and III, and Singer, "Some Plague Tractates." Additionally, Cohn provides some discussion of plague tractates and their evolution over time in his article "The Black Death: End of a Paradigm," 707-710.

[149] Cohn, "The Black Death: End of a Paradigm," 707-708.

[150] Cohn, "The Black Death: End of a Paradigm," 709-710.

[151] Talbot, *Medicine in Medieval England,* 121.

[152] Gottfried, *The Black Death,* 118.

[153] Gottfried, *The Black Death,* 119.

[154] William Crossgrove, "The Vernacularization of Science, Medicine, and Technology in Late Medieval Europe: Broadening Our Perspectives," *Early Science and Medicine* 5, no. 1 (2000): 54.

[155] Gottfried, *The Black Death,* 119.

[156] Crossgrove, "The Vernacularization of Science, Medicine, and Technology," 62.

[157] Michele Savonarola, *Il trattato in volgare della peste,* trans. Joseph P. Byrne of *Il trattato in volgare della peste,* ed. L. Belloni (Rome: For the Società Italiana di medicina interna), 1953. In Joseph P. Byrne, *The Black Death,* Greenwood Guides to Historic Events of the Medieval World, ed. Jane Chance (London: Greenwood Press, 2004), document 6, 167-169.

[158] Savonarola, *Il trattato in volgare della peste,* 168-169.

[159] John Lydgate, "Dietary and Doctrine for Pestilence," in *The Minor Poems of John Lydgate,* ed. H. N. MacCraken (London: Early English Text Society, 1934), 702. In Carole Rawcliffe, *Sources for the History of Medicine in Late Medieval England,* Documents of Practice Series, ed. Joel Rosenthal (Kalamazoo: Medieval Institute Publications, 1995), 80-81.

[160] Gottfried, *The Black Death,* 119-120.

[161] Bullough, "Education and Professionalization: An Historical Example," 163.

[162] *Chartularium Universitatis Parisiensis,* I, 488-490.

[163] Bullough, "Status and Medieval Medicine," 208.

[164] Bullough, "Education and Professionalization: An Historical Example," 164.

[165] Bullough, "Education and Professionalization: An Historical Example," 164.

[166] *Chartularium Universitatis Parisiensis,* ed. H. Denifle and A. Chatelain, vol. IV (Paris, 1889-1897), 406-407. In Lynn Thorndike, *University Records and Life in the Middle Ages,* The

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[167] Bullough, "Education and Professionalization: An Historical Example," 164.

[168] *Chartularium Universitatis Parisiensis,* ed. H. Denifle and A. Chatelain, vol. III (Paris, 1889-1897), 16-17. In Lynn Thorndike, *University Records and Life in the Middle Ages,* The Records of Civilization – Sources and Studies, ed. Austin P. Evans, no. XXXVIII (New York: Octagon Books, 1971), 235-236.

[169] Bullough, "Status and Medieval Medicine," 209.

[170] Bullough, *The Development of Medicine as a Profession,* 104.

[171] Bullough, *The Development of Medicine as a Profession,* 104.

[172] Bullough, *The Development of Medicine as a Profession,* 104-105.

[173] *Rotuli Parliamentorum,* ed. J. Strachey et al., 6 vols. (London, 1767-1777), 4: 158. In Carole Rawcliffe, *Sources for the History of Medicine in Late Medieval England,* Documents of Practice Series, ed. Joel Rosenthal (Kalamazoo: Medieval Institute Publications, 1995), 62-64.

[174] Bullough, *The Development of Medicine as a Profession,* 106.

[175] *Statutes of the Realm,* ed. A. Luders et al., 11 vols. (London, 1810-1828), vol. III, 3 Henry VIII, c. 11. In Carole Rawcliffe, *Sources for the History of Medicine in Late Medieval England,* Documents of Practice Series, ed. Joel Rosenthal (Kalamazoo: Medieval Institute Publications, 1995), 66-67.

[176] Bullough, *The Development of Medicine as a Profession,* 106-107.

[177] Bullough, *The Development of Medicine as a Profession,* 107.

[178] Bullough, *The Development of Medicine as a Profession,* 106.

[179] Luis Garcia-Ballester, Michael R. McVaugh, and Agustia Rubio-Vela. "Medical Licensing and Learning in Fourteenth Century Valencia," *Transactions of the American Philosophical Society,* New Series 79, no. 6 (1989): 38.

[180] Garcia-Ballester, "Medical Licensing and Learning in Fourteenth Century Valencia," 38.

[181] Garcia-Ballester, "Medical Licensing and Learning in Fourteenth Century Valencia," 38-40.

[182] Siraisi, *Arts and Sciences at Padua,* 166.

[183] Chauliac, *Cyrurgie,,* 12.

[184] Chauliac, *Cyrurgie,* 12.

[185] Chauliac, *Cyrurgie,* 12.

[186] Chauliac, *Cyrurgie,* 27.

[187] Bullough, *The Development of Medicine as a Profession,* 84.

[188] Bullough, *The Development of Medicine as a Profession,* 85.

[189] Bullough, "Status and Medieval Medicine," 207.

[190] John Arderne, *Treatises of Fistula in Ano,* Early English Text Society, ed. D'Arcy Power, no. 139 (London: Kegan Paul, Trench, Trübner and Co., 1910), 4.

[191] Arderne, *Treatises of Fistula in Ano,* 6-7.

[192] Bullough, "Status and Medieval Medicine," 207-208.

[193] Bullough, "Education and Professionalization: An Historical Example," 165.

[194] Bullough, "Status and Medieval Medicine," 208.

[195] Bullough, "Status and Medieval Medicine," 208-209.

[196] Bullough, *The Development of Medicine as a Profession,* 86.

[197] Bullough, *The Development of Medicine as a Profession,* 86-87.

[198] Bullough, *The Development of Medicine as a Profession,* 87.

[199] D'Irsay, "Teachers and Textbooks of Medicine," 237.

[200] D'Irsay, "Teachers and Textbooks of Medicine," 237.

[201] Bullough, "The Medieval Medical University at Paris," 208-209.

[202] Bullough, "The Medieval Medical University at Paris," 210.

[203] *Chartularium Universitatis Parisiensis,* ed. H. Denifle and A. Chatelain, vol. IV (Paris, 1889-1897), 594. In Lynn Thorndike, *University Records and Life in the Middle Ages,* The Records of Civilization – Sources and Studies, ed. Austin P. Evans, no. XXXVIII (New York: Octagon Books, 1971), 314-315.

[204] Bullough, "The Medieval Medical University at Paris," 210.

[205] Bullough, "The Medieval Medical University at Paris," 210-211.

[206] Bullough, "The Development of the Medical University at Montpellier," 521.

[207] Bullough, "The Development of the Medical University at Montpellier," 522.

[208] Bullough, "The Development of the Medical University at Montpellier" 522.

[209] Siraisi, *Arts and Sciences at Padua,* 153.

[210] Siraisi, *Arts and Sciences at Padua,* 165-166.

[211] Siraisi, *Arts and Sciences at Padua,* 169.

[212] Siraisi, *Arts and Sciences at Padua,* 168-169.

[213] Siraisi, *Arts and Sciences at Padua,* 169.

[214] Bullough, "Medieval Bologna and Medical Education," 213.

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[216] Carlo Malagola, *Statuti dell' universita e dei collegii dello studio bolognese,* rubric 68 (Bologna: Nicholas Zanichelli, 1888), 274-276. In Lynn Thorndike, *University Records and Life*

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[217] Bullough, "Medieval Bologna and Medical Education," 215.

[218] Carlo Malagola, *Statuti dell' universita e dei collegii dello studio bolognese*, rubric 35 (Bologna: Nicholas Zanichelli, 1888), 247-248. In Lynn Thorndike, *University Records and Life in the Middle Ages*, The Records of Civilization – Sources and Studies, ed. Austin P. Evans, no. XXXVIII (New York: Octagon Books, 1971), 284-285.

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ABSTRACT

THE BLACK DEATH AND THE FUTURE OF MEDICINE

by

SARAH FRANCES VANNESTE

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Advisor: Dr. Hans Hummer

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The Black Death was a catastrophic event in Europe's history. It had both devastating immediate effects and deep long-term consequences. Historians, however, have not agreed on the extent of the Black Death's effects on the development of medicine and medical practices in Europe. Some historians credit it with revealing the general failure of medieval medicine and directly sparking a reassessment and reformation of medical practices, while other historians minimize its effects on medicine or omit the Black Death entirely from their discussions of medicine's development. This paper investigates the nature and gravity of the Black Death's effects on medicine and finds the Black Death's place of importance to be in between the two extremes. The Black Death did reveal the shortcomings of the existing medical system in Europe, wherein the top medical practitioners focused on theories of causation and prevention of disease rather than practical medicine, as physicians were unable to successfully treat the plague. The Black Death sent physicians scrambling to both develop treatments for the plague and take measures to secure their status at the top of the medical hierarchy by producing writings on the plague and pushing for the regulation of medical practices. For surgeons, the Black Death provided an opportunity to challenge the position of the physicians and to assert their own

authority as medical practitioners proficient in both theory and practice. The Black Death helped cause a shift in medicine toward greater emphasis on practice than there had been before, and intensified the struggle for status between physicians and surgeons. Yet, it did not completely destroy the existing medical system. Education based on the works of Hippocrates and Galen survived in the universities, however, the teaching of surgery and anatomy were gradually included as well were they had not been before and strengthened where they were already being taught. Thus, the Black Death represents an event that helped shape medieval medicine's course of development, and as such, helped shape the development of future medical practices.

AUTOBIOGRAPHICAL STATEMENT

Sarah Vanneste was born and raised in southeastern Michigan. She attended Concordia University in Ann Arbor, Michigan, where she studied secondary education, social studies, and history and received her bachelor of arts in 2004, graduating summa cum laude. One of the main highlights of this experience was spending a semester in Vienna (2002), where she studied history, economics, and German. She also studied Latin at the University of Detroit Mercy. She earned her level I language certificate in 2007 and her level II certificate in 2009. While at Wayne State University, she has focused on medieval history, particularly in studying the Black Death and the Justinianic Plague, and is also interested in the history of medicine and disease across time. In 2008, she received the Johannesen Endowed Memorial Scholarship from Wayne State University for her paper entitled "Roman Medicine and Christianity." In May 2010, she will receive her master of arts degree in history from Wayne State University along with a certificate in world history. She hopes to continue her studies thereafter.