



'EXTENDING THE MEDICABLE' : MEDICINE AND THE CHURCH IN THE ENLIGHTENMENT

Laurence W.B. Brockliss

Rector Magnificus, members of the Sarton Committee, ladies and gentlemen: I am greatly honoured to have been elected to hold the George Sarton Memorial Chair of the History of Sciences for the academic year 1996-7. The theme of my lecture this afternoon is the changing and increasingly tense relationship between the Church and medical science in the era of the Enlightenment. As my research at present into the history of the sciences is predominantly concentrated on medicine, it seemed appropriate that my lecture should have a medical theme. As the Chair to which the Sarton Committee has so kindly elected me has been established in memory of a great positivist as well as one of the founding-fathers of the history of science, it seemed equally appropriate to choose a theme with which George Sarton would have easily related. Sarton looked forward to a future where man through the development and popularization of the sciences would be freed from the superstition of traditional religion and fully in control of nature and his own destiny. His positivist vision of the world was anticipated in many respects by the medical scientists and practitioners of the Enlightenment. As we will see, the eighteenth century was an age in which many physicians and surgeons sought to escape from the cloying shadow of the Church and create a perfected and more broadly defined medical science. Sarton could not but have applauded their endeavour and hailed the emergence of an independent, progressive medical science in the nineteenth century as a significant step on the road to his positivist future.¹

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In the historiography of the Scientific Revolution medicine and the biological sciences have always played an ambiguous and limited role. Although historians have accepted that the period 1500 to 1800 witnessed significant developments in the understanding of human and animal anatomy - notably, of course, the discovery of the circulation of the blood - they have been reluctant to identify the classic age of the Scientific Revolution with a truly profound reorientation in the life sciences. Whereas the physical and, belatedly, the chemical sciences were undisputedly 'revolutionized' in the course of this period, the birth of modern medicine is deemed to have been a nineteenth-century phenomenon, perhaps only really created at the turn of the twentieth century with the acceptance of the role of bacteria in disease. The most recent scholarly account of the history of medicine in English even suggests that before 1800 there was little radical change in the fundamentals of European medical science from the time of Hippocrates and Galen.²

This reluctance to see medicine as part of the Scientific Revolution is quite understandable. Without too great an oversimplification, the movement had three major characteristics. In the first place, it involved the development of a novel and rigorous experimental methodology for obtaining an everincreasing amount of data about the natural world, albeit one where initially social as much as scientific factors helped to validate new observations.³ Secondly, though only to a limited extent, the movement concerned the mathematization of nature, in particular the expression of the relationship of natural effects in terms of mathematical ratios (or laws).⁴ Finally, the Scientific Revolution saw a radical epistemological shift in the way nature was conceived: it ceased to be an organism and became a machine, as the Aristotelian and Neoplatonic belief that natural phenomena had the innate capacity through their peculiar form to move themselves gave way to the Cartesian view that matter was ultimately inert and all motion potentially the result of percussion. Indeed, so deep a prejudice was this in the eighteenth century that few continental natural philosophers apart from committed materialists could ever accept that Newtonian attraction was a property of matter: either its mechanical basis would ultimately be discovered (as Newton himself suggested with his ether theory) or attraction was a continual divine act, a perpetual miracle, as Maupertuis would have it, which overrode the inert nature of God's creation.⁵

The medical sciences in the period 1500 to 1800, however, were only tangentially affected by these methodological and epistemological developments.⁶ Admittedly, there was a great deal of medical research. In the sixteenth and seventeenth centuries, anatomists following in the footsteps of Harvey and the Paduan School became ever more knowledgeable about the internal contours of the human body, while in the eighteenth century another Paduan, Giovanni Battista Morgagni (1682-1771), laid the foundations of the science of pathological anatomy.⁷ In the eighteenth century, too, physicians began to prepare much more sophisticated accounts of the symptoms and course of particular diseases through the close observation of their patients. Furthermore, contemporary neo-Hippocratic interest in the effect of the environment on health led to a host of studies charting the connection between climatic change and disease in the wake of the earlier work of Thomas Sydenham (1624-89) on smallpox.⁸ Nevertheless, for all its vitality, medical research was always far less conclusive and much more contested than research in other scientific fields for the simple reason that medical scientists never formulated a rigorous research paradigm. There was no attempt to define a set of agreed research procedures, no concept of statistical significance, and no single institutional focus, akin to the laboratory, where research was located. Patients were observed wherever the physician happened to be: in a village struck down by an epidemic, at a spa, in a hospital housing the poor. The result was that medical research was either little more than random observation or it was inconsequential.⁹

More importantly, given that historians today place question marks against the rigour of much of the experimental work in the physical sciences too, at least in the seventeenth century, the medical sciences were in no way mathematicized before 1800. A few French examples make this abundantly clear. Throughout the period physicians diagnosed disease and offered a prognosis from the presence or absence of conventional signs. But these signs were always qualitatively and only exceptionally quantitatively assessed. At the beginning of the seventeenth century, a Paris student called François Mandat derided those who wished to weigh a patient's urine rather than inspect its colour and consistency.¹⁰ A hundred and fifty years later, a much more famous Paris physician, the Montpellier-trained Théophile de Bordeu (1722-76), was just as caustic at the expense of those who wanted to measure a patient's pulse-rate

using watches or metronomes : in his opinion, pulses were fast or slow, hard or soft, and so on.¹¹ Significantly, too, although the Italian Santorius invented the thermometer in the early seventeenth century, it was never used in diagnosis. It was rather the primary instrument of physician-meteorologists. Indeed, it was often their only instrument. A physician at Beaune, for instance, one Vivant-Augustin Ganiare, kept a detailed account of the weather and diseases he encountered in the town for a forty-year period from 1736 to 1777. Ganiare certainly measured the daily temperature, but his diary contains no accurate reference to wind-direction and no reference at all to wind-speed, barometric pressure or rain-fall.¹² What instruments were available to the likes of Ganiare were also frequently flawed. Convinced rightly (albeit for the wrong reasons) that there was a connection between foul-smelling air and disease, an Italian in the mid-eighteenth century called Felice Fontana (1730-1805) invented an instrument called a eudiometer which supposedly registered stench-levels mathematically. For a time towards the end of the eighteenth century, the instrument was very much in vogue but there was never any evidence it was any more discerning than the common-or-garden nose.¹³ Medicine before the turn of the nineteenth century, then, remained a qualitative science and one whose language was commonplace, imprecise and untechnical. It was decidedly not the property of experts. As the great comparative anatomist and court physician of the reign of Louis XVI, Félix Vicq d'Azyr (1748-94), bemoaned, its language was too often metaphorical. Physicians talked airily, for instance, of the animal spirits, implying thereby that the nerves were filled with liquid. In so doing, Vicq insisted, 'là l'on a commis une grande faute, en donnant un nom individuel [i.e. concrete] au lieu d'un nom abstrait à une propriété peu connue'.¹⁴

Even the promotion of the mechanical philosophy had a limited impact on the medical sciences. True, the medical theory taught in Europe's medical faculties did come under the influence of Cartesianism. Although few medical philosophers were willing to accept that animals were no more than hydraulic machines as Descartes himself had argued in his posthumous, *De l'homme* (1662), there was widespread agreement at the turn of the eighteenth century that the Galenic facultative model of physiology and pathology was now redundant. Instead, the medical mainstream opted for a theory of health and disease that married the

hydraulic Cartesian model with the iatrochemical ideas of Van Helmont and his followers. This was a mechanical medical philosophy to the extent that chemical reactions in the body were deemed to be the result of the interaction of particulate matter in motion, but it was still a theory that drew on a neo-Paracelsian, non-mechanical tradition. Its leading exponent, the highly influential Hermann Boerhaave (1668-1738), who taught at Leiden for the first thirty years of the eighteenth century, prided himself on being an eclectic and non-dogmatic.¹⁵ Moreover, as the century wore on, an increasing number of medical professors jettisoned the mechanical model altogether. From the turn of the eighteenth century, Georg-Ernst Stahl (1660-1734) at the new Prussian university of Halle, insisted that physiological processes could not be completely explained mechanically; they must in some way be governed by the soul. But Stahl's animist medical philosophy was at least metaphysically Cartesian: he retained a strict definitional separation between mind and body and accepted that matter was inert. Later critics of the mechanical model were much more radical and espoused an uncompromising vitalist philosophy that teetered on the brink of materialism.¹⁶ Vitalism in the second half of the eighteenth century was particularly associated with the Montpellier faculty. Its most important promoter there was Paul-Joseph Barthez (1734-1806) who argued that each living body was endowed with a vital principle whose activity alone could explain why in animal physiology large effects frequently seemed to flow from trivial motions. This principle had nothing to do with the soul but was a characteristic of living matter.¹⁷ Thereby, in the eyes of Barthez and his followers, the life sciences (or biology as they came to be termed) and the physical sciences were epistemologically distinct and could not be erected on the same principles. His position was admirably summed up by his pupil, the later chemist and revolutionary, Jean-Antoine-Claude Chaptal (1756-1832).

Sans doute, les lois de la mécanique, de l'hydraulique et des affinités chimiques s'exercent sur toute la matière; mais, dans l'économie animale, elles sont tellement subordonnées aux lois de la vitalité que leur effet est presque nul; et les phénomènes de la vie s'éloignent d'autant plus des résultats calculés d'après ces lois, que la vitalité est plus intense, de sorte que leur pouvoir est presque insensible dans les fonctions dévolues aux animaux.¹⁸

With a growing number of medical professors turning their backs on the model of the physical sciences, it was scarcely surprising that there had been no Scientific Revolution in medicine by 1800. In many respects vitalist medical scientists resurrected Galenic, pre-Cartesian ways of thinking about the body. Significantly, one daring medical student at Caen, Jean-François Denise, was even ready to argue that Harvey's discovery of the circulation of the blood had had deleterious consequences for the development of medicine.¹⁹ Harvey, then, was not the starting-point of modern medicine in the vitalists' eyes: the beginning still had to be made.²⁰ Leading vitalists even played down the one really important eighteenth-century development for the history of modern medicine - pathological anatomy. According to Barthez:

*L'anatomie pratique [i.e. pathological anatomy] est utile, mais elle a beaucoup d'inconvénients. L'ouverture des cadavres ne démontre que le dernier terme des effets de la maladie, à laquelle nous devons nous opposer, et ne nous fait pas connoître les premières laesions qu'elle a faites. Souvent même, elle ne nous en fait pas connoître le dernier terme.*²¹

Admittedly, this scepticism was not necessarily shared by the second generation of vitalists in France who reached maturity during the Revolutionary and Napoleonic eras. After all, it was the vitalist, Marie-François-Xavier Bichat (1771-1802), who is generally credited with the foundation of the first great school of pathological anatomy at Paris at the turn of the nineteenth century, just as it was a vitalist member of that school, René-Théophile-Hyacinthe Laënnec (1781-1826), who successfully solved the problem Barthez raised: his invention of the stethoscope made it possible to study the progress of an internal lesion prior to death.²² Nevertheless, vitalism was not usually the engine of medical progress. The future was to lie with sceptical mechanists, such as Vicq d'Azyr, who sought to maintain the traditional link between physics and medicine and deplored the vitalists' dogmatic rejection of the mechanical model.²³

Yet if it is easy to concur with the traditional view that medicine and the life sciences were of marginal importance in the Scientific Revolution, there remains good reason for regarding their contribution in

a more positive light. To do this it is necessary to look beyond the Scientific Revolution as essentially an internalist methodological and epistemological event and reexamine its potential as a movement of religious subversion. This is to reopen a debate that has been largely closed for the past twenty years.²⁴ In the nineteenth and the first part of the twentieth centuries the Scientific Revolution was viewed Whiggishly as a force for secularization and modernity. Whereas in the late Middle Ages Aristotelian science and Christian theology had been comfortable bedfellows thanks to the success of the Thomist synthesis, the replacement of the qualitative by the mechanical universe was assumed to have inevitably placed science and religion on a collision course. In the age of scholasticism Christianity had been rationally underpinned by the concepts of Aristotelian physics and metaphysics. In the Scientific Revolution those concepts were discredited and the Christian religion was left exposed in its true colours as a set of unprovable prejudices. The trial of Galileo was the beginning of a battle that would rage until the triumph of Darwinianism.²⁵

Modern historians of science, in contrast, have all but abandoned the belief that religion and the new science were at odds. Anxious to place the Scientific Revolution in its historical context, they have had no difficulty in demonstrating that the leading members of the movement were confirmed, if sometimes unorthodox Christians, whose faith greatly affected their work as experimental philosophers.²⁶ At most a Galileo was making a space for a study of the natural world independent of Scripture: he in no way threatened the Church's own domain of ethics and theology.²⁷ Descartes, too, in his metaphysics was merely demonstrating to the Church that there was nothing unorthodox about the mechanical philosophy : in urging contemporaries to embrace his sceptical method with regard to natural philosophy, he was not encouraging his contemporaries to question their religious inheritance.²⁸ In fact, since the appearance of Robert Merton's work on the relationship between Protestantism and science, historians have been more interested in discovering whether the Scientific Revolution was the property of a particular confession or sub-confession than in tracing its anticlerical character.²⁹ In recent years, even Counter-Reformation Catholicism has been seen as a positive force on the movement. The Jesuits in particular have been hailed as pioneers of the experimental philosophy, especially in the relatively *recherché*

areas of magnetism and electricity, whatever their doubts about the mechanical philosophy.³⁰ The Jesuits, too, have been acclaimed as 'modern' scientists *avant la lettre*. Whereas Galileo was a dogmatist, insisting on the fact of heliocentricity which he could not prove, his adversary, Cardinal Bellarmine, was the model of cautious open-mindedness. The Church was not implacably wedded to geocentricity: it would abandon the position as soon as the Copernican theory was evidentially confirmed.³¹

However, it would be unwise to assume there was no conflict between science and religion in this period, as becomes clear when the focus is switched from the physical to the medical sciences. Although the investigations of experimental philosophers into inert nature were often derided by both clerics and laymen - one recalls in particular the satirical portrait of Laputa in *Gulliver's Travels*, penned by Jonathan Swift, Dean of St Patrick's Dublin - there was seldom any deep objection to the physical scientist 'torturing' the natural world to reveal its secrets.³² Significantly, the Jesuits, guardians of Catholic Counter-Reformation orthodoxy, had been among the first to replicate Galileo's telescopic discoveries. Research into the life sciences, on the other hand, was viewed far less charitably and the Church, both Catholic and Protestant, frequently stymied, if it never successfully prevented, medical experimentation. Organic nature, especially animal and human life, was accorded a dignity and status which the intrusive and inquisitive probings of the medical scientist were deemed to devalue.

This suspicion of medical research was reflected in the first place in the Church's attitude to the dissection of human cadavers. Admittedly there was little or no attempt to prohibit human dissection, provided the anatomy was properly organized under the auspices of a faculty and the occasion was seemly. The faculties, too, did their best to court the Church's approval by playing down any voyeurist public element in the proceedings and turning the dissection into a moral event. The Leiden anatomical theatre was designed to remind the audience constantly of the closeness and inevitability of death: inside its walls, skeletons were placed round the edges decorated with moral saws.³³ What the Church did dislike was the commonplace practice of unsupervised anatomies where medical students, often illegally, purloined bodies or parts of bodies and dissected them in their lodgings. The existence of this practice, though,

reflected the Church's ambivalent attitude to dissection *tout court*. Although it did not prohibit official dissections, it scarcely encouraged them, for it insisted all over Europe that only the bodies of executed criminals could be thus defaced and ensured that the state made it extremely difficult for faculties to obtain female cadavers especially. Even in the second half of the eighteenth century, a leading faculty like Montpellier was known to suspend its anatomy lectures for lack of a specimen.³⁴ Inevitably, therefore, medical students anxious to gain a fuller acquaintance with human anatomy were forced to rely on their own initiative. As early as the mid-sixteenth century Montpellier medical students had turned to grave-robbing. In Paris by the early eighteenth century student lodging-houses had become veritable butchers' shops.³⁵

If the Church looked with a jaundiced eye on dissecting corpses, it inevitably ruled vivisection beyond the pale. Human vivisection, of course, was completely outlawed, but animal vivisection, too, was heavily criticized. The Cartesian belief that animals were machines that could feel no pain won few clerical supporters and the Church remained wedded to the traditional Franciscan view that mankind could use but not abuse the animal world. This, it must be said, was an opinion shared by some leading medical men. Europe's most famous anatomist in the first half of the seventeenth century, the Parisian Jean Riolan the Younger attacked Harvey for his cruelty in experimenting on animals.³⁶ In the eighteenth century, the ardent vivisectionist, the Swiss Albrecht von Haller (1708-77), was overcome by remorse in later life and became deranged.

The Church, too, did not appreciate medical experimentation of any kind when it involved human subjects. Although early attempts at transfusing the blood of humans and sheep in London and Paris in the 1660s were never formally challenged, the fact that they ceased so quickly (despite apparent success!) suggests their proponents, notably the Parisian Jean Denis, sensed the ecclesiastical axe was about to fall.³⁷ Certainly the Church continually frowned on far less graphic forms of therapeutic experimentation. In the eighteenth century the hospital, traditionally an institution for sheltering the homeless and indigent, began to be seen as a plausible site for medical research. In Catholic countries in particular, where the hospitals were usually controlled by one of the regular orders, the institution became a battleground. The Church did

everything it could to protect the dignity of the poor from an intrusive medical profession. Not only did the hospital authorities do their best to prevent the bodies of their charges falling into the hands of the medical profession on death, but they continually frustrated physicians or surgeons anxious to use the inmates as medical guinea-pigs on whom to try out new remedies or new invasive techniques. Female nursing orders were notoriously uncooperative even in the day-to-day care of patients. Convinced that the best form of treatment for the sick poor was a good meal, they frequently refused to starve their charges on the doctors' orders or administer prescribed remedies.³⁸

In other words, there is good reason to think that the speed of advance of medical science in the early modern period was seriously curtailed by the antagonism of the Church to medical research. Although there may have been good 'internal' reasons for the absence of a Scientific Revolution in medicine before 1800, a contributory 'external' factor must have been the continuing power of the Church over European society and culture, even in the Age of the Enlightenment. This is not to say that individual members of the Church were necessarily hostile to medical research. There were always some clerics who were enthusiastic supporters of medical novelty. The leading advocate and practitioner in France in the second half of the eighteenth century of the extremely contentious and novel remedy of electrotherapy in cases of paraplegia was a Perpignan abbé, one Jean-Joseph Sans.³⁹ But such exceptions are of scant significance : they merely reflect the fact that many clerics entered the Church throughout the period on parental command and without any sense of vocation. What is important is the Church's generally negative attitude. In France at least it is not surprising that medical research first became vibrant and positive in the years following the Revolution. It was only then that the hospitals were secularized and their inmates became 'citizen-patients'. In the Brave New World of the Revolution the poor were expected to donate their bodies to science in return for being looked after at society's expense.⁴⁰

Lying behind the Church's understandable concern about human and animal dignity lay a deeply embedded Augustinian outlook on life, shared as much by Catholics as Protestants. Human beings were fallen creatures born to suffer and die. God might have given us a great enough rational capacity to grasp the beauty and magnificence of the Creator

through His creation, but there was only limited room for human improvement, material or moral. 'Torturing' inert nature to reveal her secrets could be justified to the extent it might provide a fuller knowledge of the creation and divine greatness. Probing the secrets of organic nature might be similarly insightful but had to be balanced against the pain, moral and physical, it might engender. In the sixteenth century most physicians would have accepted this Augustinian world view. Theirs was a very God-centred universe. Medicine was an uncertain science, not because doctors were ignorant, but because their endeavours were ultimately dependent on divine grace. If He chose, God could frustrate for His own reasons the efforts of the most talented of physicians to cure disease. According to the Montpellier professor, the Protestant Laurent Joubert, the physician's duty was to do his best, then entrust 'l'issuë & événement à Dieu, qui donne & oste, augmente & diminue la force audits remèdes, comme il luy plaist'. As a result a physician was not to be blamed if he failed, or dismissed as ignorant. Rather, Joubert went on, 'pourveu qu'il ait bien fait son devoir, [il] ne doit estre moins estimé, que si le malade fût eschapé.'⁴¹

By the eighteenth century, in contrast, medical men had a much more Pelagian mentality.⁴² By and large they were now medical optimists who believed in the possibility of improving and maintaining the population's health. This was the great age of the medical self-help book, such as the constantly reprinted *Avis au peuple sur sa santé*, the work of the Lausanne physician Samuel-Auguste-David Tissot (1728-97), first published in 1761. Thanks to the power of the printing-press and the spread of popular literacy, even those out of reach of a doctor could benefit from the physician's wisdom.⁴³ In the physicians' eyes, medical research was now not gratuitous but purposeful, its aim to improve man's knowledge of health and disease so that the quality of life could be improved and its length extended.⁴⁴ Medical guinea-pigs were soldiers in the cause of a better future. In hymning the possibilities of medicine, therefore, medical scientists were advancing an alternative man-centred world view, one that was not necessarily anti-Christian but one that rejected an interpretation of Christianity which had dominated European culture for one and a half millenia and insisted instead that life on this earth need not be a permanent vale of tears. It was inevitable that medicine would be the favoured science of the French *philosophes*.

Promoters of a philosophy of life which stressed human potential and secular values, they saw in medicine the science of human improvement and emphasized its particular utility.⁴⁵

Of course, medical scientists in the Enlightenment were not the first to have justified research in such optimistic terms. Renaissance humanists in the fifteenth and early sixteenth centuries, notably Sir Thomas More, had turned their back on Aristotle and Augustine and glimpsed the possibility of material and moral amelioration.⁴⁶ Indeed, a vision of progress was a part of the rhetoric of the wider Scientific Revolution. According to its twin ideologues, Bacon and Descartes, the new experimental philosophy, in contrast to the Aristotelianism of the Schools, was justified as 'worker-science' : it would provide knowledge which could be used to improve man's lot.⁴⁷ In this respect, then, the new science *tout court* was a challenge to the traditional worldview of the Church. Nevertheless, even before the eighteenth century medical science had a privileged position in this novel utilitarian discourse. In the form of Paracelsianism, the sixteenth and early seventeenth centuries had witnessed the appearance of an anti-Galenic medical philosophy whose roots lay in Neoplatonism, hermeticism and popular culture. As justification for rejecting the medicine of the ancients, Paracelsus and his followers, such as the Basle physician Joseph Duchesne (called Quercetanus), developed a much more positive conception of the potential of healthcare and insisted they possessed the secret to longevity.⁴⁸ Mechanical philosophers, although seldom sympathetic to Paracelsianism, pointedly adopted its rhetoric. In extolling the utility of the new science, little was ever said about its technological possibilities; the emphasis lay rather on the benefits that would accrue to human health. Descartes's vision of progress outlined in his 1637 *Discours de la méthode* perfectly exemplifies the trend. He looked forward to perfecting the mechanical philosophy not so as to improve material prosperity but to prolong life. 'J'ai resolu de n'employer le temps qui me reste à vivre à autre chose qu'à tâcher d'acquérir quelque connaissance de la nature, qui soit telle qu'on puisse tirer des règles pour la médecine, plus assurées que celles qu'on a eues jusques à présent'.⁴⁹

It is not difficult, therefore, to understand the Church's misgivings about medical research. Even if medicine was the one area of natural philosophy wherein little was achieved in the course of the Scientific

Revolution, it was the one of which most was expected. However, the tension between the Church and the medical profession in the eighteenth century was not simply engendered by a clash of world-views. The tension was exacerbated by the knock-on effect a more positive world-view had on the practice of medicine. In the sixteenth century physicians had not only believed that ultimately their patients were in the hands of God. They had also accepted, in consequence, that the physician should play second fiddle to the priest: ministering to the patient's soul was more important than ministering to his health. The physician, too, should pray to God for the cure of his charge.⁵⁰ By the turn of the eighteenth century, physicians and surgeons were more confident in their own abilities. French physicians in the Age of the Enlightenment may not have been irreligious - some like Voltaire's doctor, the Genevan Théodore Tronchin (1709-81), were exceptionally pious⁵¹ - but they no longer automatically reached for a priestly crutch. In particular, doctors in Catholic France no longer bothered to ensure that their patients had confessed before beginning treatment, so much so that as early as 1712 the crown, on the request of the archbishop of Paris, had to remind them forcibly of their duty on pain of losing their right to practise.⁵²

More importantly, as the eighteenth century progressed physicians and surgeons began to invade the Church's own territory. In the sixteenth and seventeenth centuries the province of medical practice was narrowly defined. Physicians in particular concentrated their attention on treating the maladies of the rich. They also usually drew the line at attending the victims of the most virulent and lethal epidemic disease, the plague. When plague struck physicians notoriously followed their own prophylactic advice: they left early and returned late. Physicians such as the Montpellier professor, François Ranchin (died 1641), who as mayor stayed and organized the fight against the 1629-30 epidemic in the city, were uncommon heroes.⁵³ So, too, were physicians who aped the Jansenist Port-Royal doctor Jean Hamon and willingly sought a medical clientele among the poor.⁵⁴ All over western Europe, the resultant gaping hole in medical provision was supplied by a bevy of untrained and part-time healers - charlatans, wise-women, midwives, seigneurs, above all clergy. Many members of the secular and regular clergy must have always ministered to the body as well as the soul, but in the age of the Reformation and the Counter Reformation, where a novel emphasis was

placed on practical charity, the role of the minister or priest as a medical practitioner took on a heightened importance. In Catholic countries the new regular orders were particularly active in this respect. Throughout the towns of France regular convents became medical centres for treating the poor and sometimes even the rich. The Frères de la Charité even extended their activities to surgery, a number of members of the order becoming skilful lithotomists. Moreover, despite the concerns of the Church about therapeutic experimentation, it was commonplace for regulars to peddle their own specific remedies. The French crown even encouraged the practice: part of the Louvre was handed over to the Capuchins as a pharmaceutical laboratory.⁵⁵

From the beginning of the eighteenth century, however, physicians began to extend their field of activity. In the last great outbreak of the plague in western Europe that hit Marseilles and Provence in 1720 a number of trained medical practitioners on royal prompting actually went into the stricken region and performed heroically.⁵⁶ This was the catalyst for the emergence in the second half of the century of a new breed of enlightened physician who deliberately risked his life going out into the countryside to treat peasants struck down by epidemics. In France, the icon of the breed was the Dijon physician, Hugues Maret (1728-85), who died as a result of attending an epidemic in the village of Fresne-Saint-Masmes (near Vesoul). According to his memorialist, Vicq d'Azyr, even on his death-bed and in delirium he thought only of his peasant patients.⁵⁷

But the eighteenth-century physician not only turned his attention to the poor and lethally infectious. He began, too, to extend the conception of the medicable. In the first place he took a novel interest in hygiene. Prior to 1700 the physician had primarily concerned himself with the body in a state of disease. The preservation of health was considered a commonsense matter that could be left to the individual. All that was required was a basic knowledge of the Hippocratic non-naturals, an understanding of the Aristotelian doctrine of the mean and awareness of one's temperament.⁵⁸ In the eighteenth century in contrast, hygiene became the province of the medical expert. Good health was still deemed to depend on the proper use of the non-naturals, but its preservation was now a complex matter, especially given the novel emphasis placed on the role of the air as the fundamental external cause of disease. Every man

or woman might be able to perceive the presence of corrupt food and drink, but air was an invisible quality whose mephitic potential could only be properly judged by the medical scientist. The individual, too, could only inadequately control his or her environment. The maintenance of the people's health was a state matter. Taking up themes developed in the Holy Roman Empire by German cameralists, French physicians from the mid-eighteenth century, like the Lyons doctor Jean-Emmanuel Gilibert (1741-1814), began to demand a role for themselves as public-health counsellors.

C'est d'eux seuls [physicians] que les magistrats apprennent l'art d'assainir les grandes villes. Ils leur feront entretenir les funestes effets de la mauvaise disposition des cimetières, des boucheries, des manufactures; ils leurs découvriront les moyens de purifier les maisons, les hôpitaux; ils leur feront sentir l'importance des réglemens sur les denrées falsifiées; ils démontreront les maladies que toutes ces causes peuvent produire & les moyens de les prévenir.⁵⁹

Moreover, even a sophisticated knowledge of the non-naturals was now deemed insufficient to ensure continued health, especially the health of the young. Too many contemporary customs, especially prevalent in child-rearing, were felt to be dangerous. The physician took on an additional role as paediatrician. Under the influence of the Enlightenment's concern with the natural, physicians began to wage a campaign against parents who put their children out to nurse, swaddled them too tightly, cut their gums to encourage teething, and so on.⁶⁰ From the mid-century - Tissot and Tronchin in the van - an increasing number also promoted the value of another novel practice, smallpox inoculation.⁶¹ Children in the age of the Enlightenment were precious vessel, whose raising could no longer be trusted to parents. The physician had become a hygienist, even a beautician. In the 1730s, the Parisian physician Nicolas Andry de Boisregard (1658-1742), the first Frenchmen to discuss child-rearing in detail, invented the term orthopedics. In a work published in 1738, he not only instructed parents in how to deal with children's diseases, such as smallpox, the king's evil (scrofula), rickets and ringworm but also how to cure and avoid bodily imperfections like round-shoulders or pigeon-toes. Parents, he insisted, had a moral duty to

look after their children's appearance and mocked mothers who tried to disfigure beautiful daughters lest they became vain:

We are born for one another, and ought to shun having anything about us that is shocking; and even though a person should be left alone in the World, he ought not to neglect his Body, so as to let it become ugly; for this would be contradicting the intention of the Creator.⁶²

Finally, eighteenth-century physicians and surgeons began to interest themselves in physical states they had largely hitherto ignored. The most significant development in this respect was the 'medicalization' of pregnancy. In the sixteenth and seventeenth centuries this was the province of the midwife, usually poorly trained and semi-literate. Physicians and surgeons only became involved, and not always then, when the delivery was difficult.⁶³ In the eighteenth century, however, the midwife became demonized as ignorant and a threat to mankind. According to the Parisian Antoine Louis (1723-92), the surgeon-author of the article 'accoucheur' in the *Encyclopédie*, it was not unknown for midwives deliberately to turn a simple into a complicated birth merely to draw a crowd.⁶⁴ At the very least physicians demanded that midwives should now be properly trained. Many went further and called for their replacement altogether. The Paris physician, Antoine Petit (1718-94), could not wait for the day when women were removed from the birthplace. He did not envisage babies being delivered by graduate physicians like himself, although he certainly believed that medical students should be able to perform the task if necessary and gave private lectures on the subject. Rather he promoted the practice of employing surgeons as midwives.⁶⁵ This was a development that had first taken root in France in the late seventeenth century at the court of Louis XIV and then spread throughout Europe. Thanks to the blessing of prominent physicians, like Petit, on the eve of the Revolution in France it was commonplace even among the poor. A Reims surgeon, for instance, Pierre Robin (1725-1804), seems to have personally delivered 15 per cent of the city's babies in the 1780s.⁶⁶

It is not difficult to see why the emergence of the physician as epidemic doctor, hygienist, beautician and gynaecologist led to friction

with the Church. By pushing back the boundaries of their profession, medical men were often seriously invading the Church's space, claiming as their own territory the Church had successfully colonized. The Church had always been more than a spiritual institution: by extending the medicable, physicians were reducing its presence in the material domain and threatening its influence over the poor majority of the population. On the eve of the Revolution in Catholic France, physicians were even beginning to interest themselves in the care and treatment of the insane, a province they had traditionally left completely to the regular orders.⁶⁷ Admittedly, some physicians did not envisage a future where every man or woman would have easy access to a trained medical practitioner. The purpose of Tissot's manual was to link the world of learned medicine with the bevy of untrained practitioners by offering simple instruction in how to recognize and treat common diseases. This was a programme of accommodation, where the clergy would have continued to occupy an important role as healers.⁶⁸ By 1789, however, reformist physicians in France were much more radical. The programme *Vicq d'Azyr* offered to the Health Committee of the National Assembly sought to remove the clergy and their fellow irregulars from the field of medical practice altogether. Instead, the poor would be served by state-funded cantonal doctors, less well-trained than graduate physicians but still lay and professional.⁶⁹

The physicians putsch, however, was also, if less obviously, a threat to the Church's guardianship of moral order and thereby effected its spiritual authority as well as its secular interests. To the Church, the new concern with hygiene could not but seem to place an unseemly, un-Augustinian emphasis on the body, especially when, in Andry's case, the concern seemed to be less about raising a healthy child than in rearing a marriagable daughter. The Catholic Church was particularly threatened. Although the Counter-Reformation Church had embraced to a degree the Erasmian enthusiasm for cleanliness and table-manners, it had never fully subscribed to the new Renaissance aesthetic. The Jesuits may have presented a smart and fragrant appearance but Franciscan asceticism still retained its appeal among many of the leading regular orders, especially the Capuchins. The physicians' promotion of a similar aesthetic on health grounds inevitably met with suspicion among the most-Augustinian minded Catholics in the Church, all the more that it turned unwashed,

scantly-clad and under-fed clerical saints into potential cesspools of disease. To those who swallowed the new rhetoric, the holy Capuchin became a figure of fun.⁷⁰ The enthusiasm for hygiene, moreover, did not just undermine the authority of many regular clerics. To the extent it led to calls for the closure of cemeteries and an end to burials in church, or queried the healthiness of certain rituals, like flagellation, it challenged the Catholic Church's sacred space and undermined the commitment to baroque piety. The attack on midwifery was just as alarming. The Counter-Reformation promoted a much more gendered society than had been the case in the late middle ages : women and men had distinctive roles, epitomized in the Church's patronage of separate male and female confraternities. Delivering babies was women's work. To replace the midwife by the surgeon was to intrude a male presence into the delivery room : for a man to explore the female genitalia broke a powerful taboo and raised the spectre of immodest feelings on the part of both doctor and patient.⁷¹

In conclusion, then, there may not have been a scientific revolution in medicine before 1800, but in Catholic countries especially, the developments that did take place helped to establish a genuine tension between science and religion which in part remains unresolved today and contributed powerfully to the secularization of European society. Of course, this tension must not be overdrawn. Many enlightened physicians in Catholic states had no desire to desacralize the medical space completely. In 1774, Antoine Petit, the most famous private medical teacher in Paris in the second half of the century, submitted a plan for a new hospital in the capital after fire had damaged the overcrowded Hôtel-Dieu. Significantly, the building was carefully designed in a star shape so that every ward would open onto a central domed space housing an altar. Petit, an enlightened physician par excellence, was in no doubt about the importance of the provision of spiritual comfort in the healing process :

Dans cette disposition, il est aisé de sentir que la première des choses nécessaires à tous sera sans embarras mise à la portée de tous, puisque de chacun des points de l'intérieur de l'édifice, l'Autel sera vu, & tous les malades pourront en même-temps assister à l'Office divin.⁷²

Nonetheless, the tension between Church and medicine in the Age of the Enlightenment was real. In Catholic France undoubtedly, the period witnessed the germination of a division that would become increasingly marked in the post-Revolutionary era when the majority of physicians would identify with the secularizing and nationalizing ambitions of the nineteenth-century French state. In the French countryside especially, the doctor, along with the schoolmaster, would become the nineteenth-century government's primary agent in its war against superstition and clerical influence. Balzac's portrayal of Dr Benassis in *Le Médecin de campagne* (1833) has a satirical edge but his account of the heroic idealist confronting the idiocy of rural life is an appropriate rendering of the French profession's nineteenth-century self-image.⁷³ In the light of this future anticlerical alliance between medicine and the state, it was fitting therefore that the Revolutionaries should have housed the new Montpellier medical school, opened in 1794, in the bishop's palace (where it remains today). Equally, it was appropriate that the Revolution's instrument of vengeance that sent so many of its clerical opponents to an early grave was the invention of a leading Parisian Enlightenment physician, Monsieur Guillotin, who claimed to have discovered a humane way of killing the people's enemies.

Notes

1. Useful introductions to Sarton's positivism are Arnold W. Thackray and Robert K. Merton, 'On Discipline Building : The Paradoxes of George Sarton', *Isis*, 63 (1972), 473-95; and Töre Frangsmyr, 'Science or History : George Sarton and the Positivist Tradition in the History of Science', *Lychnos* (1973-4), 104-44.
2. Lawrence I. Conrad, Michael Neve, Vivian Nutton, Roy Porter, Andrew Wear, *The Western Medical Tradition 800 BC to AD 1800* (Cambridge University Press : Cambridge, 1995). The most accessible account of the Scientific Revolution as a long-term (not just seventeenth-century) phenomenon remains H. Butterfield, *The Origins of Modern Science* (New York, 1952).
3. The manner in which novel experimental findings gained credence has attracted much attention among Anglo-American historians of

- science in recent years : see especially S. Shapin and S. Schaffer, *Leviathan and the Air-Pump: Hobbes, Boyle, and the Experimental Life* (Princeton, NJ, 1985); and S. Shapin, *A Social History of Truth: Civility and Science in Seventeenth-Century England* (Chicago, 1994).
4. Historians who tend to identify the Scientific Revolution with the establishment of the Newtonian universe have inevitably privileged this particular aspect : e.g A. Koyré, *From the Closed World to the Infinite Universe*, Eng. trans. (Baltimore, MA, 1957).
 5. Still serviceable on the development of the mechanical philosophy is P. Mouy, *Le Développement de la physique cartésienne, 1646-1712* (Paris, 1934). On Newtonianism in France, see J. Ehrard, *L'Idée de nature en France dans la première moitié du XVIIIe siècle* (2 vols.; Paris, 1963), ch. 3; also, L.W.B. Brockliss, *French Higher Education in the Seventeenth and Eighteenth Centuries* (Oxford, 1987), pp. 360-71 (on Cartesian mechanism in the classroom).
 6. There is no really good account of medical science in this period. Useful is Lester King, *The Philosophy of Medicine : The Early Eighteenth Century* (Cambridge, Mass., 1978); this is broader in scope than it appears from the title. See also for embryology in particular : Jacques Roger, *Les Sciences de la vie dans la pensée française du XVIIIe siècle* (Paris, 1963).
 7. One historian even talks of a Harveian research school at mid-seventeenth century Oxford : see Robert G. Frank Jnr., *Harvey and the Oxford Physiologists* (Berkeley, Calif., 1980).
 8. J.C. Riley, *The Eighteenth-Century Campaign to Avoid Disease* (London, 1987).
 9. For a good idea of the random nature of much research, even when undertaken by medical pioneers, see the *livre de raison* of the famous Montpellier physician and nosologist, François Boissier de Sauvages : Archives Départementales de l'Hérault 10F 51.
 10. Bibliothèque de la Faculté de Médecine, Paris, *Theses medicae Parisiensis*, folio collection, vol. 3, no. 559, 'An urinae inspectio, certior quam pondus, et distillatio?'
 11. T. de Bordeu, *Recherches sur le pouls. par rapport aux crises* (Paris, 1756), pp.12-13.

12. Bibliothèque Municipale Dijon, MSS 425-32.
13. S. Schaffer, 'Measuring Virtue : Eudiometry, Enlightenment and Pneumatic Medicine', in A. Cunningham and R. French (eds.), *The Medical Enlightenment in the Eighteenth Century* (Cambridge, 1990).
14. 'Discours sur l'anatomie: deuxième discours', in Felix Vicq d'Azyr, *Oeuvres*, ed. J.-L. Moreau de La Sarthe (6 vols.; Paris, 1805), vol. iv, esp. p. 216.
15. For a brief account of the changing content of faculty medical theory over the period, see L.W.B. Brockliss, 'Curricula', in H. De Ridder-Symoens, (ed.), *A History of the University in Europe* (Cambridge, 1996), pp. 613-15. For France in particular, see Brockliss, *Higher Education*, pp. 400-440, *passim*; and Laurence Brockliss and Colin Jones, *The Medical World of Early Modern France* (Oxford, 1997), pp. 107-50, 418-41. On Boerhaave and his influence, see G.A. Lindeboom, *Hermann Boerhaave: The Man and His Work* (London, 1968).
16. For vitalism in Europe generally, see F. Duchesneau, *La Physiologie des lumières: empirisme, modèles et théories* (The Hague, 1982), especially pp. 1-64, 103-71; also E. Haigh, *Xavier Bichat and the Medical Theory of the Eighteenth Century (Medical History, supplement 4: London, 1984)*.
17. The most recent study of the Montpellier school is Elizabeth A. Williams, *The Physical and the Moral: Anthropology, Physiology and Physical Medicine in France, 1750-1850* (Cambridge, 1994). Other vitalists (e.g. Bordeu) believed that each organ had its separate vital principle.
18. Jean-Antoine-Claude Chaptal, *Mes souvenirs*, ed. A. Chaptal (Paris, 1893), pp.19-20.
19. Archives départementales du Calvados 1D 996, fos. 351-7, 'An detectus ab Harveo sanguinis circuitus ad medicinae progressus fecerit?'
20. This was particularly true of the science of therapeutics. See Barthez, 'Cours de thérapeutique' (n.d.), Bibliothèque Municipale Montpellier, MS 256, fos. 24-5, where he claims therapeutics to be on the eve of a medical 'revolution' [his term].
21. *ibid.*, fo. 9.

22. On the Paris School, see M. Foucault, *Naissance de la clinique* (Paris, 1963); E. Ackerknecht, *Medicine at the Paris Hospital, 1794-1848* (Baltimore, MA, 1967); J.E. Lesch, *Science and Medicine in France: The Emergence of Experimental Physiology, 1790-1835* (Cambridge, Mass., 1984). Some historians have begun to argue that the Paris school was not so important as has been previously thought: see esp. O. Keel, 'Cabanis et la généalogie épistémologique de la médecine clinique', Ph. D. dissertation, McGill University, Canada, 1977.
23. Félix Vicq d'Azyr, 'Discours sur l'anatomie: premier discours', in *Oeuvres*, vol. iv, esp. p. 15.
24. For an introduction to the debate, see R. Hooykass, *Religion and the Rise of Modern Science* (London, 1972).
25. A view particularly championed by Marxists and popularized in Brecht's *Galileo*.
26. Newton seems to have been an anti-Trinitarian: see Frank Manuel, *The Religion of Isaac Newton* (Oxford, 1974).
27. See his 'Letter to the Grand-Duchess Christina' (1615), English trans. published in *The Galileo Affair: A Documentary History*, ed. M.A. Finocchiaro (Berkeley, 1989), document 3.
28. Descartes's *Meditationes* (1640) in which his metaphysics was fully developed were dedicated to the Paris Faculty of Theology, the fount of Catholic orthodoxy.
29. The role of English Puritans in promoting the new science has been a particular centre of controversy: see especially the rich study of Charles Webster, *The Great Instauration: Science, Medicine and Reform 1626-1660* (London, 1975). For Merton's original contribution to this debate, see Robert K. Merton, 'Science, Technology and Society in Seventeenth-Century England', *Osiris*, 4(1938), 360-632.
30. The value of Jesuit science has been most recently assessed in a special issue of *Science in Context*, 3: 1 (1989), 'After Merton: Protestant and Catholic Science in Seventeenth-Century Europe'. See also, J.L. Heilbron, *Elements of Early Modern Physics* (Berkeley, Calif., 1982), pp. 93-107; Robert J.W. Evans, *The Making of the Habsburg Monarchy, 1550-1700: An Interpretation* (Oxford, 1979), part iii, *passim*; some of the essays in Luce Giard

- (ed.), *Les Jésuites à la Renaissance: système éducatif et production du savoir* (Paris, 1995); and John W. Witek (ed.), *Ferdinand Verbiest (1623-1688). Jesuit Missionary, Scientist, Engineer and Diplomat* (Monumenta Serica Monograph Series, no. 30: Leuven, 1994).
31. As it did in 1822 once stellar parallax had been confirmed.
 32. This grim metaphor was the brain-child of Francis Bacon, who had spent the 1590s overseeing the torture of suspected English Catholic traitors and knew all about extracting information from recalcitrant material: see the comment in Julian Martin, *Francis Bacon, the State and Natural Philosophy* (Cambridge, 1992), p. 166.
 33. T.H. Lensingh-Scheurleer, 'Un amphithéâtre d'anatomie moralisé', in id. and G.H.M. Posthumus Meyjer (eds.), *Leiden University in the Seventeenth Century : An Exchange of Learning* (Leiden, 1975).
 34. Chaptal, *Mes souvenirs*, pp. 16-17.
 35. Felix Platter, *Beloved Son Felix : The Journal of Felix Platter, a Medical Student in Montpellier in the Sixteenth Century*, trans. and intro. S. Jeannett (London, 1961), pp. 89-93; *Johannes Gessners Pariser Tagebuch: 1727*, ed. V. Boschung (Bern, 1985), pp. 104-5.
 36. N. Mani, 'Jean Riolan II (1580-1657) and Medical Research', *Bulletin of the History of Medicine*, 42 (1968), 127-8.
 37. Harcourt Brown, 'Jean Denis and the Transfusion of Blood, Paris 1667-1668', *Isis*, 39 (1948), 15-28. The first sheep to human transfusion occurred in England in November 1667 and was performed by Richard Lower and Edmund King : see *Philosophical Transactions*, 2(1667), 517-25, 557-64, 617-24.
 38. Brockliss and Jones, *The Medical world of Early Modern France*, pp. 671-8, 701-17.
 39. *ibid.*, p. 575.
 40. Dora Weiner, *The Citizen-Patient in Revolutionary and Imperial Paris* (Baltimore, MA, 1993), especially pp. 181-3, on the availability of bodies for dissection.
 41. Laurent Joubert, *Première et seconde partie des erreurs populaires et propos vulgaires, touchant la médecine & le régime de santé*,

- refutuez et expliquez* (Lyons, 1608), premier livre, pp. 47 and 81. This work first appeared under a slightly different title in 1578.
42. Pelagius, fourth and early-fifth century opponent of Augustine, had argued that what human beings ought to do, they can do. He stressed the freedom of the will and human potential.
43. A. Emch-Dériaz, *Tissot: Physician of the Enlightenment* (New York, 1992), ch. 5. On the phenomenon generally, see R. Rey, 'La Vulgarisation médicale au XVIIe siècle : Le cas des dictionnaires portatifs de santé', *Revue d'histoire des sciences*, 44 (1991), 413-33.
44. There were still medical men with an Augustinian outlook: see L.W.B. Brockliss, 'The Medico-Religious Universe of an Early Eighteenth-Century Parisian Doctor: The Case of Philippe Hecquet', in Roger French and Andrew Wear (eds.), *The Medical Revolution of the Seventeenth Century* (Cambridge, 1989), especially pp. 204-18.
45. For a good discussion, see Peter Gay, 'The Enlightenment as Medicine and Cure', in W.H. Barber (eds.), *The Age of the Enlightenment : Essays Presented to Theodore Besterman* (London, 1967).
46. Thomas More, *Utopia*, English translation by Paul Turner (London, 1965), pp. 97-101.
47. For a general account of the utilitarian basis of the new science, see Thomas Dacausta Kaufmann, *The Making of Nature: Aspects of Art, Science and Humanism in the Renaissance* (Princeton, NJ, 1993). For a detailed account of Bacon's commitment to worker-science, see Antonio Perez-Ramos, *Francis Bacon's Idea of Science and the Maker's Knowledge Tradition* (Oxford, 1988).
48. Joseph Duchesne, *Le Pourtraict de la santé où est au vif représentée la règle universelle et particulière de bien sainement, et longuement vivre* (Saint-Omer, 1618). Paracelsus's treatise *De longa vita* appeared in a 1567 French compendium of his works.
49. 'Discours de la méthode', sixième partie, in R. Descartes, *Oeuvres philosophiques*, ed. F. Alquié (3 vols.; Paris, 1963-73), i. 649-50. Descartes also hinted that he would not use his new science to develop military technology.

50. Joubert, *Erreurs*, premier livre, pp. 12-13, 79-83. General comment in Brockliss and Jones, *Medical World*, pp. 80-4.
51. Tronchin took a very unChristian delight in his patient's purportedly wretched demise. See R. Pomeau, *Voltaire en son temps* Vol.5. *On a voulu l'enterrer* (Oxford, 1994), pp. 321-3.
52. F.A. Isambert, et al., *Recueil général des anciennes lois françaises depuis l'an 420 jusqu'à la Révolution de 1789* (29 vols.; Paris, 1822-33), xx. 573, 'Déclaration portant que les médecins seront tenus d'avertir leurs malades attaqués de maladies graves de se confesser'.
53. Brockliss and Jones, *Medical World*, ch. 1. For Ranchin, see L. Dulieu, *La Médecine à Montpellier*, iii. *L'Epoque classique* (2 vols., Avignon, 1983-6), i. 785-6 (biographical notice).
54. Nicolas Fontaine, *Mémoires pour servir à l'histoire de Port-Royal* (4 vols.; Cologne, 1753), iv. 393-400.
55. Brockliss and Jones, *Medical World*, pp. 255-62. For recent accounts of clerical healers in other parts of Europe, see especially Hans de Waardt, 'Chasing Demons and Curing Mortals : The medical Practice of Clerics in the Netherlands', in Hilary Marland and Margaret Pelling (eds.), *The Task of Healing : Medicine, Religion and Gender in England and the Netherlands, 1450-1850* (Rotterdam, 1996).
56. Brockliss and Jones, *Medical World of Early Modern France*, ch. 6, section 1.
57. Vicq d'Azyr, 'Eloge de Maret'. *Oeuvres*, iii. 135. Vicq, secretary to the Société Royale de Médecine, founded in 1778, wrote a number of eulogies of members of the society stressing their role as new physicians : see Daniel Roche, 'Talents, raison et sacrifice: L'image des médecins des lumières d'après les éloges de la Société Royale de Médecine', *Annales, économies, sociétés, civilisations*, 32 (1977), 866-86.
58. Few hygiene manuals were printed in the sixteenth and seventeenth centuries and the subject was hardly ever taught as part of the faculty course : see Brockliss and Jones, *Medical World*, p. 460.
59. Emmanuel Gilibert, *L'Anarchie médicale, ou la médecine considérée comme nuisible à la société* (3 vols.; Neuchâtel, 1772), i. 185. On the new interest in hygiene, see Brockliss and Jones,

- Medical World*, pp. 461-7; for developments of public health in eighteenth-century France, see *ibid.*, pp. 750-8. The leading eighteenth-century exponent of the role of the state in hygiene was the Austrian, J.P. Frank.
60. The leading French work on child-rearing was written by the Parisian physician, Jean-Charles Desessartz (1729-1811), *Traité de l'éducation corporelle des enfans en bas âge, ou réflexions pratiques sur les moyens de procurer une meilleure constitution aux citoyens* (Paris, 1760), especially 'discours préliminaire'. The work was used by Rousseau in preparing his educational treatise, *Emile* (1762): see English trans. (London, 1969), pp. 10-12.
 61. Brockliss and Jones, *Medical World*, pp. 470-2: initially there was hostility in the French medical world especially to accepting inoculation, introduced into Europe in 1718 from the Near-East by an English gentlewoman.
 62. *L'Orthopédie, ou l'art de prévenir et corriger dans les enfans les difformités du corps* (Paris, 1738); citation from the Eng. trans., *Orthopaedia, or the Art of Correcting and Preventing of Deformities in Children* (2 vols.; London, 1743), i.37.
 63. Brockliss and Jones, *Medical World*, pp. 262-73. The one midwife before 1700 to have a public profile was Louise Bourgeois, who delivered the children of Marie de' Medici, and wrote a number of books about her art: see the recent study by Wendy Perkins, *Midwifery and Medicine in Early Modern France: Louise Bourgeois* (Exeter, 1996). Bourgeois deplored the ignorance of midwives.
 64. *Encyclopédie, ou Dictionnaire raisonné des arts et sciences*, ed. D. Diderot (16 vols. 1751-1765), i.85.
 65. Antoine Petit, 'Accouchemens', Wellcome Institute for the History of Medicine, MS 3847 (n.d.), 'Discours préliminaire'; Jean Verdier, *La Jurisprudence de la médecine en France* (2 vols.; Alençon, 1763-3), i. 287.
 66. Brockliss and Jones, *Medical World*, pp. 610-17. Male midwifery became common all over northern Europe in the eighteenth century: see Jean Donnison, *Midwives and Medical Men: A History of Interprofessional Rivalries and Women's Rights* (New York, 1977), especially chs. 2 and 3 (on England).

67. Brockliss and Jones, *Medical World*, pp. 443-5. The medication of the mad would only fully attract the physicians' attention during the Revolution : see Weiner, *Citizen-Patients*, ch. 9. For the most detailed, albeit biased, account of the care and treatment of the insane in France, see M. Foucault, *Folie et déraison. Histoire de la folie à l'âge classique*, 2nd edn. (Paris, 1972). In Protestant England the medical profession seems to have taken a greater interest in madness throughout the eighteenth century : see Roy S. Porter, *Mind-Forg'd Manacles : A History of Madness from the Restoration to the Regency* (London, 1987).
68. Tissot, *Avis au peuple sur sa santé* edn. (2 vols; Lyons, 1763), i. introduction, p. 21 preface.
69. Félix Vicq d'Azyr, 'Nouveau Plan de constitution pour la médecine en France', in *Histoire et Mémoires de la Société Royale de Médecine : Années 1787-8*, volume 9 (Paris, 1790), especially pp. 59-73.
70. Cf. comments in Carl-Ludwig Poellnitz, *Amusemens des eaux de Spa : Ouvrage utile à ceux qui vont boire ces eaux minérales sur les lieux* (2 vols.; Amsterdam, 1734), i. 349-82. Capuchins established convents in most spa towns in Catholic countries to offer spiritual aid to the suffering and created gardens where they could relax : see *ibid.*, pp. 14-16, 64, 284.
71. Cf. the arguments against the man-midwife in Philippe Hecquet *De l'indécence aux hommes d'accoucher les femmes et de l'obligation aux femmes de nourrir leurs enfants* (Trévoux, 1708), especially p. 5. Hecquet, it will be recalled, was a Jansenist : see above note 44. In England a number of man-midwives became the confidantes and even lovers of their clients, suggesting conservative suspicions were not necessarily misplaced: see Roy S. Porter, 'William Hunter : A Surgeon and a Gentleman', in W.F. Bynum and Roy S. Porter (eds.), *William Hunter and the Eighteenth-Century Medical World* (Cambridge, 1985), p. 17.
72. Antoine Petit, *Mémoire sur la meilleure manière de construire un hôpital de malades* (Paris, 1774), p. 10: Petit's capitalization.
73. Benassis is a good man but, like so many of Balzac's creations, an obsessive: the villagers suffer from a disease which he cannot cure; hence his endeavours are fruitless. The best account of

nineteenth-century French medicine is J. Léonard, *La Médecine de l'Ouest au XIXe siècle* (3 vols.; Lille, 1978), much more wide-ranging than the title suggests.