

Aspects of Hobbes

Noel Malcolm, one of the world's leading Hobbes scholars, presents a set of extended essays on a wide variety of aspects of the life and work of this giant of early modern thought. The greater part of this volume is published here for the first time. Malcolm offers a succinct introduction to Hobbes's life and thought, as a foundation for his discussion of such topics as his political philosophy, his theory of international relations, the development of his mechanistic world-view, and his subversive biblical criticism. Several of the essays pay special attention to the European dimensions of Hobbes's life, his sources and his influence; the longest surveys the entire European reception of his work from the 1640s to the 1790s. All the essays are based on a deep knowledge of primary sources, and many present striking new discoveries about Hobbes's life, his manuscripts and the printing history of his works. *Aspects of Hobbes* will be essential reading not only for Hobbes specialists, but also for all those interested in seventeenth-century intellectual history more generally, both British and European.

*Aspects
of
Hobbes*

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The following abbreviations are used not throughout the book, but only in the notes to specific essays, where they are also explained on their first occurrence. For the convenience of the reader, they are also listed here:

AAS	Archives de l'Académie des Sciences, Paris.
ADC	Archives Départementales du Calvados, Caen.
BMC	Bibliothèque Municipale de Caen.
BMP	Bibliothèque Mazarine, Paris.
CAO	City Archives Office, Southampton.
FPCL	French Protestant Church of London, Soho Square.
HL	Huguenot Library, University College, London.
HLRO	House of Lords Record Office, London.
HRO	Hampshire Record Office, Winchester.
HW	Clarendon Edition of the Works of Thomas Hobbes (Oxford, 1983-).
PRO	Public Record Office, London.
RCHM	Royal Commission on Historical Manuscripts.
SC	Stationers' Company, Stationers' Hall, London.
UBA	Amsterdam University Library.
V.C.H.	Victoria County History.

A Summary Biography of Hobbes

Both Hobbes and Locke came from families of West Country clothiers, and Bacon was the grandson of a sheep-reeve (a chief shepherd). All three family stories tell us something not only about the importance of wool in the English economy but also about the role of education in stimulating social mobility during the sixteenth and seventeenth centuries. Bacon's father, thanks to his studies at Cambridge, was able to become a prominent lawyer and marry into the aristocracy. Locke's father was also trained as a lawyer, although he remained a humble country attorney; thanks to his own education at Oxford, Locke was able to pursue a career that included diplomatic work, secretarial assistance to a rich politician, and, eventually, a well-paid government administrative post. Of the careers of these three philosophers, Hobbes's was certainly the least adventurous. But it too would not have been possible without his education at Oxford, which gave him his entrée to the Cavendish family, with whom he was to spend most of his life. The expense of educating a son up to university level may have been a threshold over which the poorest in society could not cross; yet the threshold was set relatively low, and once it had been passed a wide range of possible careers opened up.

One career that did not exist during this period was that of a professional philosopher. Not only was philosophy not defined or demarcated as a discipline in the way that it is today (the term was used to include the whole range of physical sciences as well), but there was no professionalization of the subject. Some of those who wrote about philosophical matters, such as Henry More or Ralph Cudworth, may have been employed as academics. By publishing philosophical works, however, they were not exhibiting academic research so much as entering a republic of letters that was inhabited equally by churchmen, physicians, noblemen, officers of state, schoolmasters, and even, in the case of Hobbes's friend Sir Kenelm Digby, a one-time amateur pirate. With the proliferation of printing houses in seventeenth-century England, it was not difficult to get published. The modern system of royalties did not exist, but the code of patronage ensured that a well-chosen

dedication might be handsomely rewarded. Books were expensive to buy; however, for example, *Leviathan*, when it was first published, cost eight shillings, which was more than most ordinary labourers earned in a week. Any writer who wanted to keep up with what was being published on philosophical subjects needed one of four things: a private income, a well-paid job, membership of a circle of book-lending friends, or access to a well funded library. Hobbes's career as tutor and secretary to the Cavendish family gave him the last of these four in full; over the years he enjoyed the other three in smaller measure. He was content to remain the employee or retainer of a great noble household—a somewhat old-fashioned career pattern that gave him access to a higher social world without making him a member of it, and which kept him for months at a time in physical seclusion from the metropolitan intellectual scene. But it also gave him security, time to write a large quantity of works on a huge range of subjects, and powerful political protection against the public hostility to some of those works during the last three decades of his life.

I

Hobbes was born on 5/15 April 1588, in Westport, a parish on the northwestern side of the small town of Malmesbury, in north Wiltshire. His father, an ill-educated country clergyman, was curate of the small neighbouring parish of Brokenborough, which was one of the poorest livings in the area.¹ Some members of the family had grown prosperous in the cloth-making business. These included Edmund Hobbes (probably Hobbes's great-uncle), who became alderman, i.e. mayor, of Malmesbury in 1600; an even richer cousin, William Hobbes, who was a 'great clothier'; and Francis, the elder brother of Hobbes's father, who was a prosperous glover and became alderman of Malmesbury in 1625.² Other Hobbeses in and around Malmesbury included some less prominent clothiers and two alehouse-keepers, Edmund and Robert Hobbes of Westport, whose exact relationship to

Thomas Hobbes cannot be established.³ It seems likely that Hobbes's father spent more time in the Westport alehouse than he did in his church at Brokenborough; during the archdeacon's visitation of the deanery of Malmesbury in October 1602 he failed to appear before the visitors, and two months later he was hauled up before the archdeacon's court 'for want of quarter sermons and for not cathe-chising the young'.⁴

Worse trouble was to follow. In October 1603 Hobbes's father was accused in the episcopal court of slandering Richard Jeane, the vicar of Foxley (a nearby parish), whom he had described as 'a knave and an arrant knave and a drunken knave'. Required to make a public act of penitence in Foxley church, Hobbes's father failed to turn up for the occasion; fined 33s 3d, he failed to pay and was threatened (and eventually punished) with excommunication. In February 1604 he chanced on Jeane in the churchyard at Malmesbury, whereupon, in the words of a witness, he 'followed the said M^r Jeane revyling him and calling him knave and coming neare vnto him strooke him the said M^r Jeane with his fist vnder the care or about the head'.⁵ Any act of violence in a church or churchyard was an excommunicable offence, but laying violent hands on a clergyman was an even more serious crime in ecclesiastical law, for which corporal punishment was possible; and any excommunicated person who failed to seek absolution from the Church could be arrested and imprisoned by the civil authorities after forty days.⁶ Hobbes's father 'was forced to fly for it' and died 'in obscurity beyond London'.⁷

By the time these dramatic events occurred, Hobbes was already at Oxford; whether he ever saw his father again is not known. It is possible that he had been sent to university because, like his father, he was a younger son who was expected to go into the Church. (His elder brother, Edmund, was to pursue the family trade as a clothier.) If so, we may suspect that these events strengthened whatever anti-clerical tendencies were already present in Hobbes's character. Hobbes owed his Oxford education to two people: his uncle Francis, who paid for it, and a young clergyman, Robert Laimner, who had taught Hobbes Latin and Greek to a high standard at a little school in Westport. Laimner was evidently a keen classicist and

¹ John Aubrey mistakenly claims that Hobbes's father was vicar of Westport ('*Brief Lives*, *chiefly of contemporary lives, set down by John Aubrey, between the years 1609 & 1666*, ed. A. Clark, 2 vols. (Oxford, 1898), I, p. 323). Ecclesiastical records for 1602-3 describe him as curate of Brokenborough (Wiltshire Record Office, Trowbridge; Archdeaconry of Wiltshire, Act Books (Office), vol. 1 (formerly vol. 40), fos. 107r, 12v, 177r). The church at Brokenborough had been one of the most poorly equipped in 1553 (J. E. Nightingale, *The Church Plate of the County of Wiltshire* (Salisbury, 1891), p. 197), and in 1649 its tithes yielded an income of just £20 per annum. E. J. Bodington, *The Church Survey of Wiltshire, 1649-50*, *Wiltshire Archaeological and Natural History Magazine*, 41 (1920), p. 6.

² J. Aubrey, *Wiltshire: The Topographical Collections*, ed. J. E. Jackson (Devizes, 1862), p. 235 n. (where 1660 is a misprint for 1600); Aubrey, *Brief Lives*, I, pp. 323-4, 387; R. Luce, *An Old Malmesbury Minnie Book, Wiltshire Archaeological and Natural History Magazine*, 47 (1935-7), pp. 322, 325; G. D. Ramsay, ed., *Two Sixteenth Century Taxation Lists, Wiltshire Archaeological and Natural History Society, Records Branch*, 10 (Salisbury, 1954), p. 48.

³ Edmund received a licence to keep an alehouse in 1600 (Wiltshire Record Office, Trowbridge; Quarter Sessions, Criminal Business, 1598-1603, p. 20). Robert, possibly Edmund's son, is listed as an alehouse-keeper in 1620: N. J. Williams, ed., *Tradesmen in Early Stuart Wiltshire* (Wiltshire Archaeological and Natural History Society, Records Branch, 5 (Salisbury, 1959), p. 30).

⁴ Wiltshire Record Office, Trowbridge; Archdeaconry of Wiltshire, Act Books (Office), vol. 1 (formerly vol. 40), fos. 107r, 132v.

⁵ Wiltshire Record Office, Trowbridge; Episcopal Deposition Book (Instance), vol. 22b (1603-1604/4), fos. 19-20r (first quotation), 48v (second quotation); Episcopal Act Book (Instance), vol. 33a, fos. 56a (inserted loose sheet), 73r, 80v, 108v. See also A. Rogov, *Thomas Hobbes* (New York, 1986), pp. 25-9.

⁶ H. C. Coote, *The Practice of Ecclesiastical Courts* (London, 1847), p. 111; R. Cosins, *An Apologie for Sundry Proceedings* (London, 1593), pp. 58-60; H. Conser, *The Practice of the Spiritual and Ecclesiastical Courts* (London, 1847), pp. 41-2.

⁷ Aubrey, *Brief Lives*, I, p. 387.

an inspiring teacher who may have become an intellectual and moral father-figure for Hobbes; as it happened, it was Latimer who replaced Hobbes's father as curate of Brokenborough.⁸ Latimer had been an undergraduate at Magdalen Hall in Oxford, and it was there that Hobbes was sent to study at the age of 13 or 14.⁹

Magdalen Hall was one of the poorer foundations at Oxford, having developed out of a grammar school attached to Magdalen College. Both the College and the Hall had been regarded as centres of Puritanism since the 1560s and 1570s; Magdalen Hall's reputation for Puritanism was strengthened under a principal, John Wilkinson, who was appointed in 1609. The Hall, unlike the College, had no chapel, and since its daily services of morning and evening prayer were said in an unconsecrated building (the dining hall), it was possible to add Puritan exercises to the forms of prayer contained in the Prayer Book.¹⁰ The sympathy for some of Calvin's teachings that Hobbes displayed in later life may date from his time at Magdalen Hall. On the other hand, Calvinism was not the same as Puritanism, and his later hostility towards Presbyterians in particular and religious enthusiasts in general is well known. In his autobiographical writings, Hobbes passes no comment on the religious climate of his undergraduate years. He tells us little about his studies either, except to dismiss the Aristotelian logic and physics that he was taught. Instead of such useless stuff, he says, he preferred to read about explorations of new-found lands and to study maps of the earth and the stars.¹¹ Astronomy thus emerges as his earliest scientific interest—an interest he evidently kept up, since we know that he observed the appearance of a comet in 1618.¹² In retrospect, Hobbes evidently regretted that he had not been taught the key to the exact sciences, mathematics. He complained in *Leviathan* that until very recently geometry had 'had no place at all' in the universities, and his advice on education was that a boy should be 'entered into geometry when he understands Latin [because] it is the best way of teaching logic'.¹³

It is hard to judge the fairness of Hobbes's criticisms of Oxford. The official curriculum laid down in the statutes of 1564–5 was indeed conservative and dominated

⁸ Aubrey, *Brief Lives*, I, pp. 324, 328–9, 332, 393 (where Aubrey calls Latimer 'a good Graecian'); Wiltshire Record Office, Trowbridge Bishops' Transcripts, Brokenborough, bundle 4, and Westport, bundle 1 (which includes elegant Latin tributes by Latimer to two dead parishioners).

⁹ J. Foster, *Alumni oxonienses* (Oxford, 1891–2), entries in vols. II, III. The exact date of Hobbes's matriculation is not known; his autobiography states that it was during his fourteenth year (*Thomas Hobbes angli vita*, p. 1; *OL* I, p. xiii), i.e. between April 1601 and April 1602. He adds, however, that he stayed at Oxford for five years (ibid.), and we know that he was admitted BA in Feb. 1608. Aubrey says he entered Oxford 'at fourteen years of age', and dates his arrival there, plausibly, to the beginning of 1603 (*Brief Lives*, I, pp. 328, 330).

¹⁰ S. G. Hamilton, *Henford College* (London, 1903), pp. 100–11; M. H. Curtis, *Oxford and Cambridge in Transition* (Oxford, 1959), pp. 191–2. On the general differences between a hall and a college, see N. Fitzherbert, *Oxonienis academiae descriptio* (Rome, 1602), p. 28.

¹¹ Hobbes, *Thomas Hobbes angli vita*, p. 1 (*OL* I, xiii); *Thomas Hobbesii malmesburienis vita*, p. 3 (*OL* I, xxxv–xxxviii).

¹² Hobbes, *Critique du De mundo de Thomas White*, ed. J. Jacquot and H. W. Jones (Paris, 1973), p. 151.

¹³ Hobbes, *Leviathan*, p. 370; J. Aubrey, *Aubrey on Education*, ed. J. E. Stephens (London, 1972), p. 61.

by the works of Aristotle (although it did include some standard astronomical and geometrical works, including Euclid, which Hobbes would have had to study if he had wanted to proceed MA). Hobbes's complaint that the philosophy taught at the universities was 'Aristotelian' had some truth to it. There had been a definite revival of Aristotelianism in England in the latter part of the sixteenth century, and extra decrees were issued in Oxford in 1586 to exclude the use of authors who disagreed with the 'ancient and true philosophy' of Aristotle.¹⁴ But, on the other hand, there is a mass of evidence that academics in the early seventeenth century had intellectual interests, especially in the sciences, which went far beyond the official curriculum, and that these interests were often reflected in their teaching.¹⁵ Nor should we assume that Hobbes's hostility to scholastic logic would have found no sympathetic echo in the Oxford of his day. The humanist criticism of scholasticism lingered on at the university. One fiercely anti-scholastic oration delivered in Magdalen Hall two or three years before Hobbes's arrival attacked the 'clumsy and barbarous words, "entities", "formal essences", and "quiddities"; and asked rhetorically: "How are ethics improved by the knowledge of propositions or the manufacture of syllogisms?"¹⁶

II

For someone who did not intend to pursue a career in the Church or the university, there was little point in staying on for the further degree of MA. Fortunately, Hobbes was offered employment immediately after completing his BA. On the recommendation of John Wilkinson he was taken on as a tutor by William Cavendish, a rich Derbyshire landowner who had been created a baron in 1605 and was to become first Earl of Devonshire in 1618. Hobbes's pupil, the future second Earl (also named William Cavendish), was only a few years younger than Hobbes himself. He had been entered briefly at St John's College, Cambridge; Hobbes joined him there in the summer of 1608 and accompanied him from Cambridge to Derbyshire in November.¹⁷ Thereafter Hobbes's relation to his charge seems to have been less that of a tutor than that of a servant, a secretary, or a friend. In

¹⁴ S. Gibson, ed., *Sententia universitatis oxoniensis* (Oxford, 1931), pp. 389–90 (1564–5), 437 (1586). On the Aristotelian revival, see H. Kearney, *Scholars and Gentlemen* (London, 1970), pp. 81–93; C. B. Schmitt, *Philosophy and Science in Sixteenth-Century Universities*, in E. Murdoch and D. Sully, eds., *The Cultural Context of Medieval Learning* (Dordrecht, 1973), pp. 485–590; C. B. Schmitt, *John Case and Aristotelianism in Renaissance England* (Montreal, 1983), pp. 33–76.

¹⁵ See M. Feingold, *The Mathematicians' Apprenticeship* (Cambridge, 1984).

¹⁶ BL MS Harl. 6460, fol. 1v. 2r. This oration, an attack on logic, seems also implicitly anti-Ramist but the Ramist movement (which divided logic from rhetoric and asserted the primacy of the former) was also hostile to scholastic logic.

¹⁷ Cavendish proceeded MA (a privilege of nobility) in the summer of 1608, and Hobbes also incorporated at St John's (which he was entitled to do as an Oxford BA); Foster, *Alumni oxonienses*. Payment for the Nov. journey is recorded in Chasworth, MS Harclwick 29, p. 38.

Aubrey's words, 'He was his lordship's page, and rode a hunting and hawking with him, and kept his privy purse.'¹⁸

The young William Cavendish was not without intellectual and literary interests. In 1611 he published (anonymously) a short but elegant work, *A Discourse against Flattery*, the essayistic style of which suggests the influence of Bacon.¹⁹ Three years later Hobbes and Cavendish went on a tour of France and Italy. During their stay in Venice in the winter of 1614-15 they both learned Italian, and Cavendish's exercises in the language included preparing a translation into Italian of Bacon's *Essays*. Back in England, Cavendish was in personal contact with Bacon by 1616, and Bacon himself helped to revise the Italian translation of the *Essays* before it was published in 1618.²⁰ We know from Aubrey and another source that Hobbes became acquainted with Bacon and did some secretarial work for him, taking down dictation 'in his delicate groves where he did meditate', and helping to translate some of his *Essays* into Latin.²¹ This contact has traditionally been assumed to have taken place during the final years before Bacon's death in 1626 (and it was from Hobbes that Aubrey learned the story of how Bacon died from a chill caught when experimentally stuffing a chicken with snow); however, Hobbes's personal acquaintance with Bacon probably dates from the work on the Italian translation of the *Essays* in 1617-18. From the first Earl of Devonshire's account book, it is clear that Hobbes also visited the Lord Chancellor on his employer's legal business in May 1619, and another entry records the disbursement of the sum of two shillings 'to Mr Hobbs wch he gave away at y^e Lo: Chan.' in May 1620.²²

Despite all these personal contacts, it is hard to find any evidence of a strong or direct Baconian influence on the substance of Hobbes's later philosophy. Some elements of Bacon's thinking may find an echo in Hobbes's works: the tendency towards naturalism or physicalism (as shown by Bacon's interest in ancient atomism or modern writers such as Telesio), for example, or the attack on false entities generated by language (the idols of the marketplace). The general project of replacing scholasticism with a new but equally all-encompassing system of knowledge was also common to both writers. But none of these tendencies or projects had been peculiar to Bacon. It is clear, on the other hand, that Hobbes rejected Bacon's obscure but largely traditional metaphysics of 'forms', and that the so-called inductive method propounded by Bacon had little influence on Hobbes compared with his later discovery of the Euclidean method of definition and deduction.

¹⁸ *Brief Lives*, I, pp. 330-1.

¹⁹ The work is dedicated to Cavendish's brother-in-law Lord Bruce and can be confidently attributed to Cavendish, both because of the wording of that dedication and in view of its later inclusion in *Horae subsecivae* (see below).

²⁰ N. Malcolm, *De Dominis (1560-1624)* (London, 1984), pp. 47-54.

²¹ Aubrey, *Brief Lives*, I, pp. 70, 331; Hobbes, *Correspondence*, II, Letter 168.

²² Chatsworth, MS Hardwick 29, pp. 603, 633.

The influence of Bacon's *Essays* on the young William Cavendish, however, was evidently powerful. In 1620 an original collection of essays was published anonymously under the title *Horae subsecivae*. It included a version of the *Discourse against Flattery* and a group of other essays in the Baconian style that can definitely be attributed to Cavendish; a fair copy of these essays, in Hobbes's hand, survives at Chatsworth.²³ In addition to the *Discourse against Flattery* and the essays in the Chatsworth MS, the published text of *Horae subsecivae* also included three new discourses. One was a description of Rome, obviously the fruit of Hobbes's and Cavendish's visit there in October 1614; the others were 'A Discourse upon the Beginning of Tacitus' and 'A Discourse of Lawes'. A recent statistical analysis of the prose characteristics of *Horae subsecivae* suggests that, while the rest of the work was not composed by Hobbes, these three discourses may have been.²⁴ This is a little surprising in the case of the description of Rome, since writing such accounts when on a tour of Europe was a traditional exercise performed by pupils, not tutors.²⁵ But in the case of the other two discourses, it is possible to see resemblances between the arguments of these writings and Hobbes's later thinking. The discourse on Tacitus, for example, coolly assumes the importance of deception and self-interest in political affairs, and both discourses stress the unique evil of anarchy or civil war. On the other hand, the claims made in the 'Discourse of Lawes' about the relationship between law and reason and about the independent status of common law as something grounded in 'the judgement of the people' are in conflict with Hobbes's later position.²⁶ Even if these discourses were by Cavendish and not by Hobbes, they give us an important insight into the thinking of the man who was intellectually and personally closest to him at this time.

Hobbes's introduction to political life and contemporary political thinking came largely through Cavendish's activities. Cavendish was never a prominent politician, but he was a member of the 1614 and 1621 parliaments, and Hobbes would no doubt have followed those debates that Cavendish attended.²⁷ On his return

²³ From the nature of the corrections in this MS, which are in another hand, it can be demonstrated that Hobbes was not the author of these essays, as has sometimes been claimed; Hobbes was evidently transcribing from a rough draft that he sometimes misread. Although published anonymously, *Horae subsecivae* is attributed to Cavendish in an early (c.1657) library catalogue at Chatsworth, and the copy of the book in that library (presmark 31 H) is inscribed 'written by Candysh' ('Candish' was the 17th-century pronunciation of Cavendish). For other evidence confirming this attribution, see D. Bush, 'Hobbes, Cavendish and "Essays"', *Notes and Queries*, n.s., 20 (1973), pp. 162-4.

²⁴ I am grateful to Noel Reynolds for allowing me to see details of a forthcoming study of this evidence by him and John Hilton.

²⁵ See e.g. M. G. Brennan, ed., *The Travel Diary (1611-12) of an English Catholic, Sir Charles Somers*, Proceedings of the Leeds Philosophical and Literary Society, 23 (Leeds, 1993), p. 1.

²⁶ Cavendish, *Horae subsecivae*, pp. 239, 267, 516-17 (civil war); 31 (law and reason); 34-2 (common law).

²⁷ Richard Tuck, misled by the traditional but false belief that Hobbes and Cavendish began their European tour in 1610 (on which see Malcolm, *De Dominis*, p. 120, n. 280), has mistakenly identified the William Cavendish who was an MP for Derbyshire in 1614 as Cavendish's cousin, the future Earl of Newcastle (*Philosophy and Government 1572-1671* (Cambridge, 1993), p. 281). Both Cavendishes were elected to this parliament: see M. Jansson, ed., *Proceedings in Parliament, 1614*, Memoirs of the American

from Italy in 1615, Cavendish kept up a correspondence with the Venetian friar Fulgenzio Micanzio, who was the friend and personal assistant of Paolo Sarpi; Micanzio's letters were translated by Hobbes for further circulation.²⁸ In this way Hobbes must have gained a special interest in the writings and political actions of Sarpi, who had defended Venice against the papal interdiction of 1606 and developed a strongly anti-papal theory of Church and State in which the temporal ruler alone is the source from whom all jurisdictions flow and to whom they all return.²⁹ And through Cavendish and the connection with Micanzio, Hobbes must also have come into contact with the Croatian-Venetian churchman and writer Marc'Antonio de Dominis, who came to England in 1616, assisted in the project of translating Bacon into Italian, supervised the publication of Sarpi's *Historia del concilio tridentino*, and published a large and influential anti-papal treatise of his own, *De republica ecclesiastica*.³⁰ Also thanks to Cavendish, Hobbes became a member of two trading and colonizing companies in which Cavendish had an interest: the Virginia Company and the Somer Islands Company (which organized the settlement of the Bermudas). Hobbes was granted a share in the former by Cavendish in June 1622; the date of his formal involvement in the latter is not known, but his role as assistant to Cavendish would certainly have involved him in the affairs of both companies before he became a shareholder himself. At the thirty-seven separate meetings of the Virginia Company's governing body that Hobbes attended in 1622-4, he came into contact with prominent politicians and writers such as Sir Edwin Sandys (who criticized royal policy on taxation and foreign affairs in the parliament of 1621) and the lawyer John Selden (whose friend Hobbes later became).³¹

William Cavendish succeeded his father as second Earl of Devonshire in 1626, but he died only two years later, at the age of forty-three. At the time of his death, Hobbes was finishing work on a translation of Thucydides, which was published with a dedication to Cavendish's elder son (the third Earl), in the following year. This was an important work of scholarship; it was the first translation of the work into English directly from the Greek, and it also included a detailed map of ancient Greece compiled from many sources and drawn by Hobbes himself. Although Thucydides' work is famous for its speech by Pericles in defence of Athenian democracy, its publication by Hobbes may nevertheless have been an implicitly pro-royalist political statement, since the main theme of the book is the gradual

Philosophical Society, 172 (Philadelphia, 1988), pp. 447, 451. For the 1621 parliament, see W. Notestein *et al.*, eds., *Commons Debates in 1621*, 7 vols. (New Haven, Conn., 1935), II, pp. 467, 482.

²⁸ V. Gabrieli, 'Bacone, la riforma e Roma nella versione Hobbesiana d'un carteggio di Fulgenzio Micanzio', *The English Miscellany*, 8 (1957), pp. 195-250.

²⁹ This quotation is from a *consiglio* (statement of advice to the Venetian government) of 1609; see C. M. Francesconi, *Chiesa e stato nei consigli di Sarpi* (Vicenza, 1942), p. 121 n. On Sarpi's theories of Church and State, see also B. Ulianich, 'Considerazioni per una ecclesiologia di Sarpi', in F. Iseloh and P. Mann, eds., *Festschrift Joseph Lortz*, 2 vols. (Baden-Baden, 1968), II, pp. 369-444.

³⁰ See Malcolm, *De Dominis*.

³¹ See N. Malcolm, 'Hobbes, Sandys, and the Virginia Company', Ch. 3 below.

subversion of the Athenian state by ambitious demagogic politicians. In his verse autobiography Hobbes emphasizes this aspect of Thucydides' work, saying that Thucydides was Hobbes's favourite historian because 'he shows how incompetent democracy is'.³²

After the death of the second Earl, Hobbes left the service of the Cavendishes for two years. He was again employed as a tutor for the son of a rich landowner, Sir Gervase Clifton, and in 1629-30 he travelled with the young Gervase Clifton to France and Switzerland.³³ From later accounts by Hobbes and Aubrey we learn that it was during his stay in Geneva in April-June 1630 that Hobbes began to read Euclid's *Elements* in 'a gentleman's library' and fell in love with its deductive method. It is unlikely, given his known earlier interest in astronomy, that this was Hobbes's first encounter with geometry; nor need we assume that he had never encountered Euclid's work before. What he stresses in his own account of the incident is that the work delighted him, 'not so much because of the theorems, as because of the method of reasoning'.³⁴ This strongly suggests that Hobbes's mind was already preoccupied with some philosophical problems to which Euclidean method seemed to supply the solution. Of the nature of those problems, however, there is no direct evidence from this period itself.

After his return to England, Hobbes was taken back into the service of the widowed Countess of Devonshire in early 1631 as a tutor to her son, the third Earl. Possibly Hobbes was already spending much of his time reading about mathematics and other scientific subjects; in a legal document written in 1639, he explained that he had accepted this tutorship 'amongst other causes chiefly for this, that y^e same did not much diuert him from his studies'.³⁵ The boy was only 13, and Hobbes now had to reach at a more elementary level than he had done before. One of the methods he used was to go through a Latin translation of Aristotle's *Rhetoric*, making a 'digest' of it with his pupil. A version of this digest was later published in English by Hobbes. It is a largely faithful summary of Aristotle's analysis of how people can be swayed by appeals to their passions and interests.³⁶

III

The 1630s were crucial years in Hobbes's intellectual development. They saw not only the growth of his interest in science (especially optics) but also the formation of the main outlines of his political philosophy, which appeared as *The Elements of*

³² *Thomas Hobbesii mathematicarum visa*, p. 4 (OL I, p. lxxviii). For a valuable discussion of Hobbes's translation of Thucydides, see M. Reik, *The Golden Land of Thomas Hobbes* (Detroit, 1977), pp. 36-52.

³³ See Hobbes, *Correspondence I*, Letters 3-8.

³⁴ Hobbes, *Thomas Hobbes angli visa*, p. 4 (OL I, p. xiv); Aubrey, *Brief Lives*, I, p. 332 (where Aubrey's manuscript gives the name of the city as '... a').

³⁵ Chatsworth, MS Hobbes D. 6, fo. 2r.

³⁶ See J. T. Harwood, ed., *The Rhetorics of Thomas Hobbes and Bernard Lamy* (Carbondale, Ill., 1986); L. Strauss, *The Political Philosophy of Hobbes*, tr. E. M. Sinclair (Chicago, 1952), pp. 35-42.

Law at the end of the decade. Although we know more about his intellectual and personal life in this decade than in the previous ones, there is much that remains obscure. Recent studies have tended to locate Hobbes in two particular intellectual groups during this period. One was the 'Welbeck academy' of scientists connected with the Earl of Newcastle (so called after one of his family seats, Welbeck Abbey in north Nottinghamshire). They included Newcastle's brother, Sir Charles Cavendish, a talented mathematician who corresponded with mathematicians and scientists on the Continent; Newcastle's chaplain, Robert Payne, who conducted chemical experiments with Newcastle; and Walter Warner, who had been one of a number of scientists and free-thinkers (including Thomas Hariot) patronized by the Earl of Northumberland in the 1590s and 1600s.³⁷ Hobbes was especially close to the Cavendish brothers in the late 1630s. He corresponded with Payne, who became one of his closest friends, and he also took an interest (although not an unscrupulous one) in Warner's work on optics. We know that he was in contact with Warner, sending him suggestions of his own about the angle of refraction, as early as 1634.³⁸

The other grouping was the so-called Great Tew circle that gathered round Lucius Cary, Viscount Falkland (whose house, Great Tew, was near Oxford). Its members included theologians such as William Chillingworth, Oxford divines such as George Morley and Gilbert Sheldon, London lawyers such as Edward Hyde (the future Earl of Clarendon), and poets such as Edmund Waller.³⁹ At the heart of the Great Tew circle lay the collaboration between Falkland and Chillingworth in an attempt to formulate a moderate and rational Anglicanism as a defence against Roman Catholicism. This defence of 'rational religion' was characterized as 'Socinianism' (an anti-Trinitarian heresy) by hostile critics, especially the more extreme Protestant ones; and the Great Tew writers' rejection of traditional ideas of spiritual authority in the Church, with their tendency to judge questions of church government in terms of mere convenience or conduciveness to temporal peace, set them apart from Laudians as well as Catholics. These characteristics would also be found in Hobbes's later writings, and attracted in even stronger terms. Hobbes certainly owed some of his ideas about religion to members of the Great Tew circle, even though his defence of rational religion was not based, as theirs generally was, on assumptions about the essential reasonableness of God.

³⁷ On Newcastle, Sir Charles Cavendish, and Robert Payne, see Hobbes, *Correspondence*, II, Biographical Register. On Warner, see *ibid.*, I, Letter 16, n. 3. On the Welbeck circle and its connection with Warner and Hariot, see R. H. Kargon, *Atomism in England from Hariot to Newton* (Oxford, 1966), pp. 6-42.

³⁸ A proposition about the angle of refraction, in Hobbes's hand but entitled 'Mr. Hobbes analogy' in Warner's hand, is in BL MS Add. 4395, fols. 131, 133.

³⁹ On Great Tew, see especially B. H. G. Wormald, *Clarendon: H. R. Trevor-Roper, Catholics, Anglicans and Puritans* (London, 1987), pp. 166-230; and J. C. Hayward, 'The *Mores* of Great Tew', Cambridge University Ph.D. dissertation, 1983.

Although Hobbes's connections with various members of these two intellectual groupings are not in doubt, the idea of his belonging to two 'circles' located at Welbeck and Great Tew is misleadingly schematic. The phrase 'Welbeck academy' is just a metaphor for a group of people connected with the Cavendish brothers and does not refer to physical gatherings, either formal or informal; there is no evidence, for example, that Walter Warner ever set foot in Welbeck Abbey. As for Great Tew, while it is clear that there were physical gatherings there, it is unlikely that Hobbes was more than a very occasional visitor to Falkland's house. One possible opportunity for a visit came in 1634, when Hobbes may have stayed for a while in Oxford, using that town also as a base for a visit to his old friends in north Wiltshire.⁴⁰ Otherwise Hobbes is most likely to have encountered members of Falkland's circle in London. Outside its inner core of Oxford men, this circle had a more peripheral membership of London-based intellectuals, court wits, and poets, and it is among these that most of Hobbes's personal friendships with Great Tew writers are to be found—men such as the poet Edmund Waller and the lawyer Edward Hyde. Yet the intellectual and social world of early seventeenth-century England was so closely knit that one has only to begin pursuing possible connections to see any neat pattern of separate 'circles' break up before one's eyes. Thus, for example, Hobbes's intellectual contacts with the liberal Oxford theologians are likely to have come in the first place from Robert Payne, an Oxford man who was a friend of Sheldon, Morley, and Hammond; many of the poets and wits attached to Falkland's circle were also friends and admirers of Ben Jonson, whom Hobbes had known in 1628, before the Great Tew circle came into being; Jonson was himself a protégé of Newcastle and a friend of Payne; and Hyde was also connected with Walter Warner, whose patron during this period was Hyde's father-in-law, Sir Thomas Aylesbury.

In 1634 Hobbes embarked on another Continental tour with his pupil, the third Earl of Devonshire. They spent nearly a year in Paris, setting off for Italy at the end of August 1635; they were in Rome in December of that year, in Florence in April 1636, and back in Paris in early June, whence they returned to England four months later.⁴¹ Even before he set out on this tour, Hobbes's mind had been filled, thanks partly to the stimulus of the Earl of Newcastle and his mathematician brother, Sir Charles Cavendish, with thoughts about optics, physics, and psychology. In early 1634 he had been commissioned by the Earl of Newcastle to find a copy of Galileo's *Dialogo*, and his earliest surviving letter sent from Paris during this tour answers a query from an unnamed correspondent about the functioning of vision and memory.⁴² The two prolonged stays in Paris that this continental trip allowed him were clearly of great importance to Hobbes's intellectual life. From the Earl of Newcastle and Sir Charles he had introductions to French scientists and

⁴⁰ See Hobbes, *Correspondence*, I, Letter 11, n. 2.

⁴¹ *Ibid.*, I, Letters 12-21. ⁴² *Ibid.*, I, Letters 10, 12.

mathematicians such as Claude Mydorge, a writer on geometry and optics who was a close friend of Descartes.⁴³ It was probably through Sir Charles's good offices, either directly or indirectly, that he was introduced to the learned, pious, and charming friar Marin Mersenne, who was also a friend of Descartes, and who was already functioning as the centre of a huge network of scientific and philosophical correspondents. Hobbes later recorded in his autobiography that he had investigated 'the principles of natural science' in Paris at this time (principles that 'he knew . . . were contained in the nature and variety of motions'), and that he had communicated his ideas on this subject to Mersenne on a daily basis.⁴⁴ We know that he observed experiments carried out by William Davison, a famous Scottish chemist who taught at Paris, and during his final months in the French capital he was discussing philosophical matters with the maverick Catholic intellectual Sir Kenelm Digby.⁴⁵

By the time Hobbes returned to England in October 1636, he was devoting as much of his time as possible to philosophical work: 'the extreme pleasure I take in study', he wrote, 'overcomes in me all other appetites.'⁴⁶ His pupil came of age in the following year, and although Hobbes remained in his service his time was now largely his own; much of it was probably spent with the Earl of Newcastle and his brother at Welbeck. In a letter to the Earl from Paris in 1635, Hobbes had expressed an ambition to be the first person to give 'good reasons for y^e faculties & passions of y^e soule, such as may be expressed in playne English'; and, from a later letter from Sir Kenelm Digby, it appears that Hobbes had been planning, during his final months in Paris, a work on 'Logike' that would begin, in Euclidean fashion, with the definitions of primary terms.⁴⁷ Whether these writings on logic and psychology or epistemology were conceived from the outset as a single, systematic project cannot be said with certainty, but all the evidence of Hobbes's later work indicates that the urge to systematize was located deep in his intellectual character. It is unfortunate that any manuscript drafts of this project that Hobbes may have written during this crucial period of his intellectual formation, 1636-9, have apparently not survived. One manuscript traditionally attributed to Hobbes (and dated by some authors to this period, although by others to the beginning of the 1630s), the so-called Short Tract, is in the handwriting of Robert Payne and can more plausibly be attributed to him.⁴⁸ Another manuscript on metaphysics

⁴³ See Hobbes, *Correspondence*, I, Letter 18.

⁴⁴ *Thomas Hobbes angli vita*, pp. 4-5 (OLI, p. xiv). For a brief reference to the contents of one such discussion, see Hobbes, *Correspondence*, I, Letter 34.

⁴⁵ Hobbes, *Correspondence*, I, Letter 19, n. 4; Letters 20, 25.

⁴⁶ *Ibid.*, I, Letter 21. ⁴⁷ *Ibid.*, I, Letters 16, 25.

⁴⁸ For a modern edition of this MS (BL MS Harl. 6796, fols. 297-308), see 'Hobbes', *Court Treatise des principes principes*. For the attribution to Payne, see R. Tuck, 'Hobbes and Descartes', in G. A. J. Rogers and A. Ryan, eds., *Perspectives on Thomas Hobbes* (Oxford, 1988), pp. 16-18, and Hobbes, *Correspondence*, II, Biographical Register, Payne.

and epistemology, which definitely does contain material written by Hobbes and which has previously been dated to the period 1637-40, can more probably be dated to some time after July 1643.⁴⁹

The earliest surviving scientific-philosophical work by Hobbes is a manuscript treatise on optics, the so-called 'Latin Optical MS', which must have been completed by 1640.⁵⁰ This important work evidently formed part of a larger body of writing; it refers back to a previous *sectio* (section) in which basic principles of physics had been discussed, such as the rule that 'all action is local motion in the thing which acts'.⁵¹ Since Hobbes was later to use the term 'section' for each of the three works that made up his tripartite 'Elements of philosophy' (*De corpore*, *De homine*, and *De civitate*), and since Hobbes put his main discussion of optics in *De homine*, it is possible that this optical treatise was a version of what later became *De homine*, and that the earlier 'section' to which it refers was a body of work corresponding to what was eventually published as *De corpore*.⁵² How roughly the missing 'section' corresponded to that work can only be guessed at, but Hobbes's slow and hesitant drafting and redrafting of *De corpore* during the 1640s suggests that whatever existed before 1640 was probably more like a set of notes than a polished text. (This would fit the account of Hobbes's working methods given by Aubrey and by Hobbes himself.⁵³)

The striking thing about the Latin Optical MS, which probably set it apart from the previous 'section', was the fact that so much of it took the form of a running critique of Descartes' 'Dioptrique'. This was the short treatise on optics (in particular, refraction) that had been published as one of the essays accompanying Descartes's *Discours de la methode* in 1637. (Hobbes had been sent a copy of the book by Sir Kenelm Digby soon after its publication.) Descartes's work had an unsettling effect on Hobbes, for two reasons. First, Descartes's mechanistic physics, and his assumption that perception is caused by physical motions or pressures that have no intrinsic similarity to the qualities (redness, heat, etc.) that are

⁴⁹ For a modern edn of this MS (National Library of Wales, MS 5297), see Hobbes, *Critique de De mundo*, pp. 449-60. For previous datings, see M. M. Rossi, *Alle fonti del decimo e del materialismo moderno* (Florence, 1942), pp. 120-3, and A. Pacchi, *Conversione e ipotesi nella formazione della filosofia naturale di Thomas Hobbes* (Florence, 1965), pp. 16-17. My reasons for dating it thus are given below.

⁵⁰ For a modern edition of this MS (BL MS Harl. 6796, fols. 193-266), though omitting the diagrams, see Hobbes, 'Tractatus opticus', ed. F. Alessio, *Rivista critica di storia della filosofia*, 18 (1965), pp. 147-228. For my reasons for this dating, see the section on 'missing letters' in Hobbes, *Correspondence*, VI, 'Textual Introduction'; and see also Tuck, 'Hobbes and Descartes'.

⁵¹ Latin Optical MS, I. 3 (Hobbes, 'Tractatus opticus', p. 148).

⁵² Tuck, 'Hobbes and Descartes', pp. 19-20. That the Latin Optical MS was part of a larger project, of at least two 'sections', is clear. But it is still unclear whether Hobbes was envisaging, from the outset, that this project would culminate in a treatise on politics. The account of the genesis of *The Elements of Law* given in the dedicatory epistle to that work (quoted below) makes it sound more of a *pièce d'occasion* than the nearly systematic retrospective explanation given in the preface to *De civitate* (ed. Warrender, p. 82).

⁵³ Aubrey, *Brief Lives*, I, pp. 334-5, 355; Hobbes, *Correspondence*, II, p. 82.

perceived, corresponded very closely to Hobbes's own theories. Although neither Descartes nor Hobbes was the first to have such ideas (they had been preceded by Isaac Beeckman and Galileo), this was still very much the frontier of modern thinking, and it must have been galling for Hobbes to see some of his own research pre-empted in print. In 1640-1 an exchange of letters between Hobbes and Descartes on optics and physics turned (at Descartes's prompting) into an acrimonious dispute about who had pre-empted—or even plagiarized—whom.⁵⁴

The second reason for Hobbes's troubled reaction to Descartes was that the metaphysics of the French philosopher seemed to be radically out of step with the proper assumptions of his physics. That Hobbes had already possessed distinctive ideas of his own on metaphysics before he read Descartes's book is indicated by the shrewd comment Digby made when he originally sent the *Discours de la methode* to Hobbes: 'I doubt not but you will say that if he were as accurate in his metaphysicall part as he is in his experience [i.e. his account of physical phenomenal], he had carryed the palme from all men living.'⁵⁵ In the Latin Optical MS, Hobbes attacked the dualism at the heart of Descartes's theory, challenging the idea that the mind could be affected by the motion of objects without itself being a physical object. 'Since vision is formally and really nothing other than motion, it follows that that which sees is also formally and strictly speaking nothing other than that which is moved; for nothing other than a body . . . can be moved.'⁵⁶ And in a set of 'Objections' to Descartes's *Meditationes*, commissioned and published by Mersenne in 1641, Hobbes broadened his attack on Cartesian metaphysics, suggesting that Descartes had failed to extricate his thinking from the assumptions of scholastic philosophy, with its hypostatized qualities, its degrees of reality of being, and its blurring of the distinction between existent beings (*entia*) and essences.⁵⁷ In general, therefore, Descartes's philosophy was more an irritant than a stimulant to Hobbes. The idea that transcending Cartesian scepticism became a major aim of Hobbes's philosophical work cannot be supported by anything in Hobbes's writings; his belief in the causal dependence of all ideas (including qualities and 'essences') on the physical properties of existing objects was part of the primary assumptions of his metaphysics, by which radical scepticism was simply precluded. Hobbes's work on science and metaphysics was interrupted at the end of the 1630s by politics. A number of issues were prompting discussion of the 'absoluteness' of sovereign power during the final years of King Charles I's personal rule. Of these, the most famous was the Ship Money case of 1637, which raised the question of whether any limits could be set to the power of the king, given that his normal powers could be exceeded in exceptional circumstances, and that the

⁵⁴ Hobbes, *Correspondence*, I, Letters 29, 31-4.

⁵⁵ *Ibid.*, I, Letter 27.

⁵⁶ Latin Optical MS, IV, 14 (Hobbes, 'Tractatus opticus', ed. Alessio, p. 207).

⁵⁷ *OLV*, pp. 249-74.

king might judge which circumstances were exceptional.⁵⁸ The Short Parliament of April 1640 (to which the Earl of Devonshire unsuccessfully tried to get Hobbes elected as MP for Derby) voiced its concerns on these issues before it was abruptly dissolved. As one speaker put it, 'if the King be judge of the necessity, we have nothing and are but Tennants at will.'⁵⁹ Four days after the dissolution of that parliament, Hobbes signed the dedicatory epistle of a treatise, *The Elements of Law*, in which he aimed to settle all such questions by working out the nature and extent of sovereign power from first principles. The dedication was to his patron, the royalist Earl of Newcastle; the principles contained in the work, Hobbes explained, 'are those which I have heretofore acquainted your Lordship withal in private discourse, and which by your command I have here put into method'.⁶⁰

That this was a polemically pro-royalist work was obvious; as Hobbes plainly stated in one of its final chapters, the idea that subjects could maintain rights of private property against the sovereign was a claim that he had 'confuted, by proving the absoluteness of the sovereignty'.⁶¹ But *The Elements of Law* was no mere polemical pamphlet. In it Hobbes had attempted to base his political principles on an account of human psychology that was compatible with (although not necessarily dependent on) his mechanistic physics. The reduction of 'reason' to instrumental reasoning was an important part of this psychological picture. Reason, on this view of things, did not inuit values, but found the means to ends that were posited by desire; 'desires might be various, but reason could also discover general truths about how to achieve the conditions (above all, the absence of anarchic violence) in which desires were least liable to be frustrated. By defining that which is 'not against reason' as 'right', Hobbes also made the transition to a different type of general truth: definitional truths about rights and obligations, which would make the claims of the anti-royalist politicians as necessarily false as those of incompetent geometers. For sovereignty to exist at all, Hobbes argued, it was necessary for all the rights of the subjects to be yielded to it; what he tried to show was that the reasons that made sovereignty necessary also made it absolute. This was a work of extraordinary assurance, an almost fully fledged statement of Hobbes's entire political philosophy. His two later published versions of his theory, *De cive* and *Leviathan*, would develop further some of the points of detail, but the essential lineaments would remain the same.

⁵⁸ The best modern account is K. Sharpe, *The Personal Rule of Charles I* (New Haven, Conn., 1992), pp. 719-30.

⁵⁹ On Hobbes's candidature, see Hobbes, *Correspondence*, I, Letter 58 n. 2; for the speech in parliament by Sir John Strangways, see E. Cope and W. H. Coats, eds., *Proceedings of Short Parliament of 1640*, Camden Society, 4th ser., 19 (London, 1977), p. 159.

⁶⁰ Hobbes, *The Elements of Law*, ed. F. Tönnies (London, 1889), pp. xv-xvi.

⁶¹ *Ibid.*, II, 8 (p. 174).

The Elements of Law circulated in many manuscript copies, which, Hobbes later recalled, 'occasioned much talk of the Author; and had not His Majesty dissolved the Parliament, it had brought him into danger of his life'.⁶² Possibly Hobbes was already thinking, during the summer of 1640, about going to live in Paris, for reasons of political safety and intellectual stimulus. Apart from the scientists he had met through Mersenne, an old friend of the Cavendish family was there: the French courtier Charles du Bosc, whom Hobbes had known in the 1620s, and who may have extended a general invitation to Hobbes when he visited England in 1638.⁶³ In September 1640 Hobbes recovered £100 which he had asked the steward of Chatsworth to invest for him; he also had £400 banked with the Cavendish family (at 6 per cent interest), so if he withdrew all his money on deposit he must have felt financially independent enough to embark on a long period of residence abroad.⁶⁴ What finally prompted him to leave England was a debate on 7 November in the newly convened Long Parliament, in which John Pym and other anti-royalists attacked 'Preaching for absolute monarchy that the king may do what he list'.⁶⁵ Fearing that he might be called to account for *The Elements of Law*, Hobbes fled to Paris.

IV

Thanks to his connection with Mersenne, Hobbes was quickly absorbed into the intellectual life of the capital. Mersenne had acted as intermediary for the correspondence between Hobbes and Descartes, and it was Mersenne who (as mentioned above) commissioned Hobbes's 'Objections' to the *Meditations*, which were published, in 1641, with five other sets of objections and Descartes's replies. Mersenne also arranged the publication of *De cive* in 1642, over the initials 'T. H.' This book, a remodelled version of the arguments of *The Elements of Law*, was much admired for the cogency and concision of its arguments about the nature of the state, but the reductive treatment of Christian theology in the final section of the work caused many eyebrows to be raised.⁶⁶ It was *De cive* that really established Hobbes as a political writer of European repute when it was reissued (in two further editions, with additional explanatory notes by Hobbes) by the Dutch printer Elzevir in 1647. Meanwhile Mersenne had also published some small samples of Hobbes's work on physics and optics in two volumes of scientific compilations

⁶² Hobbes, *Mr Hobbes Considered*, p. 5 (*EW* IV, p. A14).

⁶³ See Hobbes, *Correspondences* II, Biographical Register, du Bosc.

⁶⁴ Charnworth, *MS Hobbes D 8* (£100); *MS Hardwick 30*, half-yearly payments for midsummer 1638. In these accounts, which go up to Michaelmas 1639, Hobbes was also receiving wages of £50 per annum from the Countess of Devonshire.

⁶⁵ Hobbes, *Correspondences* I, Letter 35 n. 5.

⁶⁶ For atypical reaction, see A. L. Schino, 'Tre lettere di Gabriel Naudé', *Revista di storia della filosofia*, 4 (1987), pp. 697-708; p. 707.

that he edited in 1644. *Cogitata physico-mathematica* and *Universae geometriae synopsis*.⁶⁷ And through Mersenne Hobbes became acquainted, in the early 1640s, with a number of French philosophers and scientists, including the anti-Aristotelian Pierre Gassendi, the mathematician and anti-Cartesian Gilles Personne de Roberval, the Huguenot physician Abraham du Prat, and two other younger Huguenots with scientific interests, Samuel Sorbière and Thomas de Martel.⁶⁸

For most of the 1640s Hobbes was preoccupied with physics, metaphysics, and theology rather than political philosophy. In 1642-3 he wrote (probably at Mersenne's request) a huge blow-by-blow refutation of a scientific and theological work by the Catholic Aristotelian philosopher Thomas White. Mersenne studied this refutation in manuscript and may well have encouraged Hobbes to have it printed, but it was to remain unpublished until 1973. The *Anti-White* (as it is now generally called) is a strange work, written obviously in a great outpouring of ideas but having recourse to a mass of earlier notes and drafts. It is not surprising that Hobbes, who had set himself the task of arranging all such material methodically in his tripartite 'Elements of philosophy', should have been reluctant to publish it in this haphazard and repetitive form. And it is clear, within the text of the *Anti-White*, that one of the topics that was giving him the most difficulty was the nature of scientific method itself. Two different models of scientific knowledge jostle for position: the knowledge of causes, and the knowledge of definitional meanings.⁶⁹ Hobbes made some unsatisfactory attempts to reconcile or unite these two models; possibly his own dissatisfaction with this aspect of his work was one reason for the slowness with which he drafted and redrafted his major work on logic, metaphysics, and physics, *De corpore*, throughout the 1640s.

Several fragmentary early drafts of this work (which was not published until 1655) survive, the most puzzling of which is a rough copy in another hand of a text that mixes English and Latin phrases. The traditional assumption that this was a semi-translation of Hobbes's Latin text by somebody else is probably false, since one whole section of the English reappears in a later English work by Hobbes. This draft was probably written in the years 1643-4; the material it contains was later used in chapters 7, 8, II, and 12 of *De corpore*, but in this draft the material forms the opening chapters of the entire work.⁷⁰ The exposition begins here with

⁶⁷ See Hobbes, *Correspondences* II, Biographical Register, 'Mersenne'.

⁶⁸ On Roberval see L. Auger, *Gilles Personne de Roberval* (Paris, 1962); on Gassendi, Abraham du Prat, Sorbière, and de Martel, see Hobbes, *Correspondences* II, Biographical Register.

⁶⁹ See 'Hobbes's Science of Politics and his Theory of Science' (Ch. 5 below).

⁷⁰ This MS was referred to above at n. 49. The English passage (from the introductory section of the MS: Hobbes, *Critique du De mundo*, p. 449) appears in Hobbes's 'Answer' to the Preface to *Comitéens* see W. Davenant, *Comitéens*, ed. D. F. Gladish (Oxford, 1973), p. 49; *EW* IV, p. 449. As Rossi noted, the MS also borrows a phrase from Sir Thomas Browne's *Religio medici*, which was published in London in 1642. If we assume that the English in the MS was Hobbes's own, an easy explanation of this link with Browne suggests itself: Sir Kenelm Digby, who had read Browne's book and written a reply to it in London in Dec. 1642, returned to Paris in July 1643 and may well have brought a copy of *Religio medici* with him. That Hobbes

Hobbes's 'annihilatory hypothesis', which asks the reader to consider the nature of ideas after the annihilation of the world that those ideas described. This was not a sceptical device, but a way of severing the connection between real being and 'essences' (which in Hobbes's view were nothing other than descriptions of existing things, with no ontological status of their own). Later drafts (an undated manuscript by Hobbes, and a closely related set of notes taken by Sir Charles Cavendish in 1645-6) inserted, before this material, a more traditional account of logic, explaining the functioning of terms, propositions, and syllogisms.⁷¹ Through Sir Charles's letters to the mathematician John Pell, we get a sense of the trouble Hobbes had with this work. 'Mr Hobbes puts me in hope of his philosophie which he writes he is now putting in order', wrote Sir Charles in December 1644, 'but I feare that will take a long time.' And again, in May 1645: 'I doubt [i.e., suspect] it will be long ere Mr Hobbes publish anything... he proceeds every day some what, but he hath a great deal to do.'⁷²

There were many interruptions to Hobbes's progress, and the arrival in Paris of Sir Charles and his brother in April 1645 was the cause of several of them. In the summer of that year Hobbes was encouraged by the Marquess (formerly Earl) of Newcastle to engage in a disputation with an exiled Anglican cleric, John Bramhall, over the nature of free will. The short treatise that Hobbes wrote was eventually published (without his authorization) as *Of Libertie and Necessitie* in 1654, and caused a long-running controversy with Bramhall on a range of theological matters. In late 1645 Hobbes composed, at the Marquess's request, a treatise on optics in English, half of which would eventually form part of *De homine* (published in 1658).⁷³ And in the summer of 1646, just when Hobbes was planning to leave Paris to work intensively on *De corpore*, he was asked to be the mathematical tutor to the young Prince Charles, who had arrived in July. The Marquess of Newcastle, who had been in charge of the prince's education in 1638, probably had a hand in this offer of employment. Hobbes did not need the job for financial reasons (two years later he was actually lending money to Newcastle), but it was not an offer he could refuse.⁷⁴ It brought him into closer contact with the politicians, courtiers, and churchmen who gathered at the Louvre and St Germain: men such as John

should have begun drafting *De corpore* at about this time is also plausible, since he had been occupied with *De cive* in 1641 and with the *Anti-White* in late 1642 and early 1643. However, the planning of *De corpore* was clearly more advanced by the time Sir Charles Cavendish took his notes on Hobbes's latest draft in 1645 (see below). Hence my dating of the National Library of Wales MS to 1643-4.

⁷¹ On these MSS, see Pacchi, *Convenzione e ipotesi*, pp. 18-26; for a composite printing of the two, see Hobbes, *Critique du De mundo*, pp. 493-533.

⁷² J. Halliwell, ed., *A Collection of Letters Illustrative of the Progress of Science in England from the Reign of Queen Elizabeth to that of Charles the Second* (London, 1842), p. 87; H. Vaughan, *The Protectorate of Cromwell*, 2 vols. (London, 1838), II, p. 364.

⁷³ The MS, known as the English Optical MS, is BL MS Harl. 3560.

⁷⁴ See Hobbes, *Correspondence*, II, Biographical Register, 'William Cavendish, first Duke of Newcastle' and 'Charles II'.

Cosin, the future bishop of Durham, and Henry Bennet, the future secretary of state Lord Arlington.

Given such contacts with royalist exiles, Hobbes's thoughts would naturally have turned more often in the later 1640s to the political situation in England. He maintained his friendship with the poet Edmund Waller, who was in exile in France after 1644; he became well acquainted with the poet Sir William Davenant (for whom he wrote a long commendatory letter, published in 1650, on his poem *Gondibert*), and he also kept in contact with Edward Hyde, Hobbes kept up some correspondence with the Earl of Devonshire in England, and he also wrote regularly to his old friend Robert Payne, who was ejected from his Oxford college in 1648 but remained in England.⁷⁵ In May 1650 Robert Payne learned about *Leviathan* for the first time, when Hobbes told him that he had completed thirty-seven chapters out of a projected total of fifty.⁷⁶ Clearly, Hobbes's work on this new book had been rather secretive and very rapid; he probably did not begin it until the autumn of 1649 (he told Sorbière in June of that year that he was working on *De corpore*, which he hoped to finish by the end of the summer), and he seems not to have mentioned it to Hyde when the latter saw him in Paris in August and September of that year.⁷⁷ By the time Hyde returned to Paris in April 1651, Hobbes was able to inform him that 'his Book (which he would call *Leviathan*) was then Printing in England, and that he receiv'd every week a Sheet to correct... and thought it would be finished within little more than a month'.⁷⁸

That Hobbes went to the trouble of arranging the printing of the work in London confirms the essential validity of the joking remark he made to Hyde when the latter asked why he wanted it published: 'The truth is, I have a mind to go home.'⁷⁹ As recently as May 1648, when Hobbes had discussed the possibility of returning to England in a letter to the Earl of Devonshire, he had written: 'When I consider how dangerous a time there is like to be for peaceable men, I am apter to wish you on this side, then my selfe on that side the sea.' But he had qualified this reluctance even then: 'I have no inclinations to the place where there is so little security, but I have such inclinations to your Lo[rds]hip as I will come to any place (if I may have a passe) where your Lo[rds]hip shall be.'⁸⁰ Thereafter things had

⁷⁵ See Davenant, *Gondibert*; Hobbes, *Correspondence*, II, Biographical Register, 'Waller', 'William Cavendish, third Earl of Devonshire', 'Payne'; E. Hyde, *A Brief View and Survey of the Dangerous and Perniciou Errors to Church and State in Mr. Hobbes's Book, entitled Leviathan* (Oxford, 1676), pp. 6-8.

⁷⁶ Payne to Sheldon, 13 May 1650 (BL MS Harl. 6942, no. 128).

⁷⁷ Hobbes, *Correspondence*, I, Letter 61; Hyde, *Brief View and Survey*, p. 7. In late Sept. or early Oct. 1649, Sir Charles Cavendish (who was now in Antwerp) received a letter from Hobbes, in which Hobbes made no reference to *Leviathan*, but said he hoped his 'philosophie' (i.e. *De corpore*) would be printed in the following spring; BL MS Add. 4278, fol. 291v (Cavendish to Pell, 5 Oct. 1649).

⁷⁸ Hyde, *Brief View and Survey*, p. 7. It was in fact published in London in the following month. The printing had been rapid; the work was entered in the Stationers' Register on 20 Jan. 1651.

⁷⁹ Hyde, *Brief View and Survey*, p. 8.

⁸⁰ Hobbes, *Correspondence*, I, Letter 58.

changed in England, with the execution of King Charles I in January 1649. Things had changed too for Hobbes in Paris. The death of Mersenne in September 1648 and the departure soon afterwards of Gassendi to the south of France meant that he was deprived of his two dearest philosophical friends.

It would, however, be too limited an explanation to say that Hobbes wrote *Leviathan* merely to ease his passage to England. Certainly he was keen—and entitled—to point out that his theory of political authority based on necessary consent (and necessary consent based on a rational understanding of ultimate self-interest) was not inherently pro-royalist (as the trappings of the argument in *The Elements of Law* and *De cive* might have made it appear to be). His argument, as *Leviathan* makes clear, was about sovereignty *per se*, which might be exercised by a king or an assembly; the shift in a subject's obligation from one holder of sovereignty to another would occur 'when the means of his life is within the Guards and Garrisons of the Enemy'—it then being rational to consent to obey the conqueror.⁸¹ Such calculations of interest had been a living issue for people such as the Earl of Devonshire, who had had to compound with the parliamentary authorities for his estates. Sir Charles Cavendish had done the same in absentia for his estates in 1649, and would be persuaded by his brother and by Sir Edward Hyde to return to England in 1651 to renegotiate for them. A decade later, Hobbes would explain that he had written *Leviathan* on behalf of 'those many and faithful Servants and Subjects of His Majesty who had been forced to compound for their lands. They that had done their utmost endeavour to perform their obligation to the King, had done all that they could be obliged unto; and were consequently at liberty to seek the safety of their lives and livelihood wheresoever, and without Treachery.'⁸²

It was reasonable of Hobbes to assume that this element of his argument would not cause intolerable offence among the courtiers of the young Charles II in Paris. Another aspect of the book that might reasonably be brought to the new king's attention was its attempt to analyse the nature of the false beliefs and harmful political practices—above all, those of organized religion—that Hobbes believed to have caused the destruction of Charles's father's kingdom. So it is not surprising that Hobbes actually presented a manuscript fair copy of the work to Charles II when the latter returned to Paris after his defeat at the Battle of Worcester in September 1651. Nor is it surprising that the theological arguments of the work, especially its ferocious attack on the Catholic Church, caused grave offence to some of the English courtiers in exile, notably those who were close to the Catholic Queen Mother, Henrietta Maria. Hobbes was barred from the court; and not long afterwards, according to the recollections of both Hobbes and Hyde, the French

⁸¹ Hobbes, *Leviathan*, p. 390. ⁸² *Mr. Hobbes Considered*, p. 20 (FW IV, pp. 420–1).

Catholic clergy made an attempt to have him arrested.⁸³ He fled from Paris in mid-December 1651 and soon thereafter crossed the Channel to England.⁸⁴

V

Hobbes settled in London, where he was able to make contact again with Sir Charles Cavendish, who had arrived there a couple of months earlier.⁸⁵ Soon he was back in the employment of the Earl of Devonshire and had reverted to the old rhythm of life of a noble household, spending the summer months in Derbyshire and much of the rest of the year in London. His work for the Earl probably amounted to little more than some light secretarial duties and general intellectual companionship; otherwise his time was his own. He spent some of it in the stimulating company of the lawyers John Selden and John Vaughan, and the physicians William Harvey and Charles Scarborough. Scarborough, a mathematician as well as a medical man, held gatherings of scientists at his London house which Hobbes sometimes attended. Hobbes was also moving in the more unorthodox and free-thinking circles of Thomas White (the Catholic philosopher whose *De mundo* he had refuted), John Davies (who published Hobbes's *Of Libertie and Necessitie* in 1654 with a bitterly anti-clerical preface), and John Hall of Durham (the educational reformer and apologist for Cromwell).⁸⁶ It was probably in Davies's circle that Hobbes met Henry Stubbe, a young Oxford scholar and radical anti-clericalist who began work—which he never completed—on a Latin translation of *Leviathan*.⁸⁷

The notoriety that *Leviathan* obtained for Hobbes was slow in coming. Early readers of the book were understandably startled by some of its theological contents, but there was no immediate outcry. A typical judgement was that of the moderate Anglican bishop of Salisbury, Brian Duppa, who wrote to a friend in July 1651: 'as in the man, so there are strange mixtures in the book; many things said so well that I could embrace him for it, and many things so wildly and unchristianly, that I can scarce have so much charity for him, as to think he was ever Christian.'⁸⁸ That some of the theological arguments in *Leviathan* were phrased in such a way as to make them sound highly unorthodox is undeniable; Hobbes himself seems to have recognized this when he pruned some of them (notably the passage in which

⁸³ *Ibid.*, p. 8 (FW IV, p. 415); Hyde, *Brief View and Survey*, pp. 8–9. See also the comments in Hobbes, *Correspondence II*, Biographical Register, James Butler, twelfth Earl and first Duke of Ormonde' and 'Charles II'.

⁸⁴ Hyde recalled that Hobbes had fled a 'few daies' before his own arrival in Paris, which was on 25 Dec. (*Brief View and Survey*, p. 8; R. Ollard, *Clarendon and his Friends* (London, 1987), p. 148).

⁸⁵ Hobbes, *Correspondence II*, Biographical Register, 'Sir Charles Cavendish'.

⁸⁶ See 'Hobbes and the Royal Society', Ch. 10 below.

⁸⁷ Hobbes, *Correspondence II*, Biographical Register.

⁸⁸ G. Isham, ed., *The Correspondence of Bishop Brian Duppa and Sir Justinian Isham, 1650–1660*, Publications of the Northamptonshire Record Society, 17 (Northampton, 1951), p. 41.

he appeared to make Moses a member of the Trinity) from his later Latin translation of the work. It is also true that his application of historical method—and causal common sense—to biblical criticism had yielded some results, such as the denial of Moses' authorship of the Pentateuch, which were unacceptable to ordinary belief. But Hobbes was probably correct in thinking that his work would not have received the vast amount of subsequent denunciation had it not been seen as threatening by a number of special-interest groups. Of these the most important were 'ecclesiastics' of various sorts—Catholic, Anglican, and Presbyterian—who saw that the basis of priestly or ministerial authority was undermined by Hobbes's arguments.

One particular interest group that Hobbes managed to offend was the universities. His attack on these institutions in *Leviathan* became suddenly topical when a proposal was made in the Barebones Parliament in 1653 to abolish them altogether.⁸⁸ Two of the leading scientists at Oxford, Seth Ward and John Wilkins, published a defence of the universities in 1654 that included a frosty reply to Hobbes; Ward (who had previously been an admirer of Hobbes, regarding him as a fellow exponent of the mechanistic new science) also published a full-length attack on Hobbes's philosophy and theology.⁸⁹ The publication of Hobbes's *De corpore*, which contained a number of incompetent attempts at geometrical proofs, made Hobbes an easy target for another Oxford scientist, the mathematician John Wallis. Hobbes became embroiled in a sequence of polemical exchanges on mathematical subjects with Wallis that would last for nearly twenty years. The real animus behind this feud, however, was their disagreement over church politics, with Hobbes regarding Wallis as the chief representative of the Presbyterians.

Since Hobbes had, by the late 1650s, acquired the enmity of three leading scientists, it is not surprising that there was some reluctance to enlist him in the Royal Society (as it later became) when it first met in 1660. But the basic reason for his exclusion was probably not just personal animosities; he had more personal friends than enemies among its membership, and there was no provision for black-balling in its elections of new Fellows. Nor was he less of a scientist than many of the active members of that body. Although his mathematical work was sometimes incompetent, his major works on physics and optics, *De corpore* (1655) and *De homine* (1658), were comparable to similar work by other scientific writers who did become Fellows of the Royal Society, and he continued to publish works on the explanation of natural phenomena, such as his *Problemata physica* (1662) and *Decameron*

⁸⁸ For the motion, see B. Shapin, *John Wilkins, 1614-72: An Intellectual Biography* (Berkeley, Calif., 1969), p. 97.

⁸⁹ J. Wilkins and S. Ward, *Vindiciae academiarum* (Oxford, 1654); S. Ward, *In Thomae Hobbesii philosophiam exercitatio* (Oxford, 1656). Ward's attack was less extreme than some others; however, he explicitly conceded (p. 340) that Hobbes was probably a theist.

physiologicum (1678). The underlying problem seems to have been that the aura of religious notoriety clinging to Hobbes meant that any public association with him would be a source of embarrassment to the active members of the Royal Society, given that his basic assumptions about a mechanistic physical universe were quite similar to their own. Many traditionalists still regarded such a world-view as leading inevitably to atheism; several key members of the Royal Society were highly sensitive to such criticism, and reacted in a pre-emptive and diversionary way by directing fierce criticisms of their own against Hobbes.⁹¹

Throughout the 1660s and 1670s Hobbes was frequently attacked, in print and from the pulpit, for his supposed atheism, denial of objective moral values, promotion of debauchery, and so on.⁹² At its crudest, this sort of criticism depended on a popular notion of 'Hobbesism' that had little to do with Hobbes's philosophical arguments and instead constituted a veiled attack on the libertinism of the Restoration court. Occasionally, however, there were more serious threats to investigate Hobbes's writings. In the early 1660s there was rumour that some Anglican bishops were planning to have Hobbes tried for heresy, and in 1666 a House of Commons committee was empowered to 'receive Information touching such books as tend to Atheisme Blasphemy or Prophanesse or against the Essence or Attributes of God. And in particular . . . the booke of Mr Hobbs called the *Leuiathan*'.⁹³ Hobbes responded to the first of these threats by composing a treatise on the law of heresy (demonstrating that people should not be burned for that offence); on one or other of these occasions he was sufficiently worried to consign many of his own manuscripts to the flames.⁹⁴ In a number of writings during these final decades, Hobbes publicly defended himself against the criticisms of his conduct and beliefs. These defences include a short autobiographical work, *Mr Hobbes Considered* (1662); the dedicatory epistle to *Problemata physica* (also 1662); an important appendix to the Latin translation of *Leviathan* (1668), in which he defended the work from charge of heresy; an angry public letter of complaint about libellous remarks inserted by the Oxford academic John Fell into a short biography of him published in 1674; an autobiography in Latin verse (1679); and, among his posthumously published works, a further defence of *Leviathan* against Bishop Bramhall (1682) and a polemical church history in Latin verse,

⁹¹ See Ch. 10 below; for two important and rather different interpretations, see Q. Skinner, 'Thomas Hobbes and the Nature of the Early Royal Society', *The Historical Journal*, 12 (1969), pp. 217-39, and S. Shapin and S. Schaffer, *Leviathan and the Air-Pump* (Princeton, NJ, 1985).

⁹² For a useful general survey, see S. Mintz, *The Humming of Leviathan* (Cambridge, 1962).

⁹³ BL MS Harl. 7257, p. 220. For the earlier rumour, see Aubrey, *Brief Lives*, 1, p. 339.

⁹⁴ For the treatise on the law of heresy, see S. Mintz, 'Hobbes on the Law of Heresy', *Journal of the History of Ideas*, 29 (1968), pp. 409-44; for its dating, see R. Willman, 'Hobbes on the Law of Heresy', *Journal of the History of Ideas*, 31 (1970), pp. 607-33. For the burning of manuscripts, see Aubrey, *Brief Lives*, 1, p. 339, and the letter from James Wheldon to Adam Barker printed in *The Gentleman's Magazine*, vol. 54, pt. 2, no. 4 (Oct. 1784), p. 779.

Historia ecclesiastica (1688), which ends with a Hobbesian credo in praise of simple Christian virtues.⁹⁵

These various publications (plus a number of other works on mathematics and complete translations into workaday English verse of Homer's *Iliad* and *Odyssey*) testify to the extraordinary vigour of Hobbes's old age. He was, after all, 63 when *Leviathan* was published, and he continued writing until his final year (aged 91). This productivity is all the more impressive when one remembers that the 'shaking palsy' (probably Parkinson's disease) from which he suffered was so severe that he was forced to dictate his writings to an amanuensis from late 1656 onward.⁹⁶ Hobbes continued to live with the third Earl of Devonshire, alternating between his London residence and his country houses, Chatsworth and Hardwick. The earl's patronage gave him protection and security. He benefited too from a resumption of friendly personal relations with his old pupil, Charles II, to whom Aubrey cleverly arranged a re-introduction in London soon after the Restoration. The king gave him—for a while—a generous pension of more than £100 per annum and ordered that Hobbes should have 'free access to his majesty'. Hobbes was able to use this privilege in 1674 to get permission to print his public letter of complaint against John Fell, after approaching the King in person in the Pall-mall in St James's park.⁹⁷ But there were limits to the King's indulgence of his old tutor. Hobbes's request for permission to print his dialogue-history of the Civil War, *Behemoth*, was turned down; attempts to reprint *Leviathan* in 1670 were abruptly suppressed by the Stationers' Company.⁹⁸

While Hobbes was generally vilified in print, he retained some loyal personal friends and admirers, such as the lawyer John Vaughan and the scientist and antiquary John Aubrey. But he must have felt that he was a prophet without honour in his own country when he compared his reputation in England with the glowing praise of his philosophical achievements that came from his many foreign correspondents. The circle of French scientists and writers who, after Mersenne's death, had clustered round Gassendi in Paris in the early 1650s (men such as Samuel Sorbière, Thomas de Marrel, and Abraham du Prat) regarded Hobbes, after Gassendi's death in 1655, as the greatest living philosopher, and told him in their letters that they eagerly read every new work of his that they could obtain.⁹⁹ Even more adulatory was François du Verduin in Bordeaux, who learned English in order to translate *Leviathan* into French (a project that never saw the light of day,

⁹⁵ For details of all these works, see H. Macdonald and M. Hargreaves, *Thomas Hobbes: A Bibliography* (London, 1972).

⁹⁶ See Hobbes, *Correspondence*, I, Letter 94, and my comments in the General Introduction to that volume.

⁹⁷ *Ibid.*, II, Biographical Register, 'Charles II.'

⁹⁸ *Ibid.*, II, Letter 208; Macdonald and Hargreaves, *Thomas Hobbes*, p. 29.

⁹⁹ See their letters in Hobbes, *Correspondence*, I, II, and the entries in the Biographical Register in *ibid.*, II.

although Hobbes seems at first to have encouraged it¹⁰⁰). Samuel Sorbière was not only a talented self-publicist but also an energetic publicizer of Hobbes's works; and it was through Sorbière's efforts that a collection of Hobbes's Latin writings, including a Latin translation of *Leviathan* made specially for it by Hobbes, was finally published by the Dutch printer Blaeu in 1668.¹⁰¹ This edition, together with frequent reprinting of *De cive* on the Continent, helped to transmit Hobbes's ideas to a wide range of readers, including Spinoza and Leibniz. The latter, indeed, was influenced more by Hobbes than by any other writer during his period of philosophical awakening late in the 1660s and early in the 1670s, and wrote to Hobbes to say so: 'I shall, God willing, always publicly declare that I know of no other writer who has philosophized as precisely, as clearly, and as elegantly as you have—no, not excepting Descartes with his supethuman intellect.'¹⁰²

Hobbes died on 4 December 1679. He had been seriously ill since October and apparently suffered a severe stroke one week before his death. As the Earl of Devonshire's secretary wrote to the Oxford historian Anthony Wood, this prevented Hobbes from taking holy communion: 'but as I am informed by my Lords Chaplaine (a worthy Gent) he has severall times lately received the Sacrament of him . . . And I did once see him receive it and received it my selfe with him, and then heooke it with seemeing devotion, and in humble, and reverent posture.'¹⁰³ Hobbes was buried at the parish church of Hault Hucknall, near Hardwick Hall, under a tombstone with a modest inscription, apparently written by Hobbes himself: 'He was a virtuous man, and for his reputation for learning he was well known at home and abroad.'¹⁰⁴ Rumour had it that he had also considered a different inscription, one that would have reminded those who knew him of one of his personal qualities which is too seldom mentioned, but which no reader of his works can fail to discover: his splendid sense of humour. The proposed inscription was 'This is the true philosopher's stone.'

ADDITIONAL NOTES

The study by Noel Reynolds and John Hilton referred to in n. 24 was published as 'Thomas Hobbes and the Authorship of the *Homo Subversivus*', *History of Political Thought*, 14 (1994), pp. 361–80. Noel Reynolds later co-edited the items in question: T. Hobbes (attrib.), *Three Discourses: A Critical Modern Edition of Newly Identified Works of the Young Hobbes*, ed. N. B. Reynolds and A. W. Saxtonhouse (Chicago, 1995). That

¹⁰⁰ *Ibid.*, I, Letters 67, 100, 108. Du Verduin also prepared a translation of *De corpore*, which was not published, and a partial one of *De cive*, which was see *ibid.*, II, Biographical Register, 'du Verduin'.

¹⁰¹ Hobbes, *Correspondence*, II, Letters 154, 156, 166, 169.

¹⁰² *Ibid.*, II, Letter 189.

¹⁰³ A. Pritchard, 'The Last Days of Hobbes', *Bodleian Library Record*, 10 (1980), p. 184.

¹⁰⁴ Aubrey, *Brief Lives*, I, p. 386.

these discourses derive, if not from Hobbes, then from someone (Cavendish) who was personally and intellectually very close to him, is more or less certain; that Hobbes may have contributed some ideas or arguments to them appears very probable; but that Hobbes himself was the author still seems to me quite doubtful.

The dating of the composition of the 'Latin Optical MS' given here (see n. 50) was based on an argument about the date at which the surviving manuscript was copied (presented in Hobbes, *Correspondence*, I, pp. liii–lv). Prompted by recent research by Dr Timothy Raylor, I have reconsidered the evidence, and now conclude that the manuscript was copied in Paris between December 1640 and, at the latest, April 1643 (or, more probably, August 1642). The composition of the work itself may perhaps be assigned to 1640 or 1641. See T. Raylor, 'The Date and Script of Hobbes's Latin Optical Manuscript', and my 'Hobbes, the Latin Optical Manuscript, and the Parisian Scribe', both in *English Manuscript Studies*, ed. P. Beal and J. Griffith, 13 (2003) (forthcoming).

The 'undated manuscript by Hobbes' referred to in n. 78 is in fact a set of notes by Robert Payne on a draft of part of *De corpore*: see Chapter 4 below on 'Robert Payne, the Hobbes Manuscripts, and the "Short Tract"', esp. pp. 99–103.

Hobbes and Spinoza

I. Hobbes

When the Parliament sat, that began in April 1640, and was dissolved in May following, and in which many points of the regal power, which were necessary for the peace of the kingdom, and the safety of his Majesty's person, were disputed and denied, Mr Hobbes wrote a little treatise in English, wherein he did set forth and demonstrate, that the said power and rights were inseparably annexed to the sovereignty; which sovereignty they did not then deny to be in the King; but it seems understood not, or would not understand that inseparability. Of this treatise, though not printed, many gentlemen had copies, which occasioned much talk of the author and had not his Majesty dissolved the Parliament, it had brought him into danger of his life.¹

Such was Hobbes's own account, written twenty-one years later, of the origins of his first work of political theory, *The Elements of Law*. Hobbes had himself been an unsuccessful candidate for election to the Short Parliament,² so no doubt he followed its proceedings closely. The disputed 'points of the regal power' emerged most pointedly in John Pym's famous speech of 17 April, which asserted fundamental constitutional rights of Parliament against the Crown ('Parliament is as the soule of the common wealth', 'the intellectual parte which Governes all the rest') and attacked 'the Doctrine that what property the subject hath in any thing may be lawfully taken away when the King requires it'. The latter point was taken up by Sir John Strangways on the following day: 'for if the Kinge be judge of the necessitye, we have nothing and are but Tennants at will'.³

The King dissolved this parliament on 5 May. Four days later Hobbes signed the dedicatory epistle of his treatise, which was addressed to his patron, the staunchly royalist Earl of Newcastle; he explained that the principles he was expounding were

This chapter first appeared in *The Cambridge History of Political Thought, 1450–1700*, ed. J. H. Burns and M. Goldie (Cambridge, 1991), pp. 350–57.

¹ T. Hobbes, *The English Works of Thomas Hobbes of Malmsbury*, ed. W. Molesworth, 11 vols. (London, 1839–45) (henceforth *EW*), IV, p. 414.

² L. Beas, 'Politics and Government in Derbyshire, 1640–1660', Sheffield University Ph.D. dissertation (1978), pp. 74–6.

³ E. Cope and W. H. Coates, eds., *Proceedings of the Short Parliament of 1640*, Camden Society, 4th ser., 97 (London, 1977), pp. 149, 155, 159.

governing the motions of discrete material particles were the ultimate laws of nature, and in this sense psychology must be rooted in physiology and physics in physics, while the social sciences, especially the technology of statecraft, must be rooted in psychology.³

The phrase 'rooted in' is perhaps a little less confident than 'derived from' or 'entailed by' would be; but the general picture is clear. This interpretation is certainly faithful to Hobbes's ontology, in which matter in motion is the only knowable reality; and it is also faithful to the overall scheme of human knowledge which Hobbes adhered to in planning his tripartite system of the 'Elements of Philosophy': *De corpore*, *De homine*, *De cive*.

As is well known, however, the history of Hobbes's writing and publishing of his tripartite system belies any strict interpretation of its cumulative structure. 'What was last in order', he writes in the Preface to the second edition of *De cive*, 'is yet come forth first in time, and the rather, because I saw that grounded on its owne principles sufficiently knowne by experience it would not stand in need of the former Sections.'⁴ There is a similar disclaimer in the first chapter of *Leviathan*, where Hobbes remarks that 'To know the natural cause of Sense, is not very necessary to the business now in hand . . . Nevertheless, to fill each part of my present method, I will briefly deliver the same in this place.'⁵ This may suggest that Hobbes's 'present method' is more a system of organization than a system of deduction.

When Hobbes says that his political theory is 'grounded on its owne principles sufficiently knowne by experience', it is open to critics such as Ryan to argue that this indicates only a short-cut in the order of knowledge, not a break in the order of truth or logical deduction. But the resort to 'experience', i.e. introspection, which Hobbes makes use of when setting out the bases of his political theory, surely produces a quite different kind of truth from the truths which might be derived from the physiology of the brain and the nervous system. And this objection is not merely a special point about the peculiarity of introspection. If we attempted to follow Hobbes's 'method' through, ascending from one level of knowledge to the next, we would find that each new level required the introduction of concepts which were simply not contained in the subject-matter of the previous level. Physics will give us the concepts of 'motion towards' or 'motion away from'; but only psychology will provide the concepts of 'desire' or 'fear'. Hobbes seems to recognize this when, in the Introduction to *Leviathan*, he invokes the maxim 'Nosce Teipsum' and asks each reader to consider 'what he doth, when he does *think*, *opine*, *reason*, *hope*, *fear*, &c, and upon what grounds'.⁶

Alan Ryan's strong version of the argument seems unable to cope with Hobbes's actual practice. The weak version, as put forward by writers such as John Watkins

³ A. Ryan, *The Philosophy of the Social Sciences* (London, 1970), pp. 102-3. I am grateful to Dr Sorell for this reference.

⁴ *De cive* (English version), ed. H. Warrender (Oxford, 1983), p. 36.

⁵ *Leviathan*, p. 3.

⁶ *Ibid.*, p. 2.

Hobbes's Science of Politics and his Theory of Science

Hobbes thought of his theory of politics as a 'science'. At the end of his English Optical Treatise he expressed the hope that 'I shall deserve the reputation of having been y^e first to lay the grounds of two sciences; this of Optiques, y^e most curious, and y^e other of Natural Justice, which I have done in my booke De Cive'.¹ The parallel, or distinction, between natural science and civil science recurs again and again in Hobbes's writings; and the difficulty for Hobbes's commentators lies in deciding what the relationship is between these two different types of science. Most critics have assumed that the two types are closely related, and that we therefore have to understand how Hobbes conducts his physical science in order to be able to understand his science of politics. But a few writers, most notably Tom Sorell in his important recent study of Hobbes's philosophy, have argued in favour of a so-called 'autonomy thesis', according to which Hobbes's political science is independent, *qua* science, of his science of nature.²

Among interpretations which argue that Hobbes's two sciences were closely related, we can distinguish two versions of the argument: a strong version and a weak one. The strong version claims that Hobbes envisaged a single, continuous chain of derivation leading from physics, via psychology, to politics: this interpretation makes him a would-be 'social scientist' of a very literal kind, and an intellectual ancestor certainly of Comte, and possibly of Mill. The weak version, on the other hand, claims only that Hobbes applied the *method* of physical science to the science of politics, so that the political theory resembles or parallels the physics without necessarily being derived from it.

A classic example of the strong version of this argument can be found in Alan Ryan's book, *The Philosophy of the Social Sciences*:

Hobbes believed as firmly as one could that all behaviour, whether of animate or inanimate matter, was ultimately to be explained in terms of particulate motion: the laws

This chapter was first published in A. Napoli, ed., *Hobbes oggi* (Milan, 1990).

¹ *EW* VII, p. 471.

² T. Sorell, *Hobbes* (London, 1986).

and Maurice Goldsmith, is better equipped to take on board Hobbes's frequent comments emphasizing the difference in subject-matter between physics and politics.⁷ The diagram of the sciences in chapter 9 of *Leviathan*, for example, begins by dividing all philosophical knowledge into two: 'Consequences from the Accidents of Bodies Naturall', and 'Consequences from the Accidents of *Politique* Bodies'.⁸ (This diagram is, admittedly, a puzzle for most theories of Hobbes's method, since it also places both ethics and the science of justice in the human subsection of the science of 'bodies natural'; but the diagram is, in any case, a system of classification of the sciences rather than a programme of deductive method.) The picture of physics and politics as two radically different areas of subject-matter, existing more or less in parallel and both qualifying as sciences, is confirmed by the first chapter of *De corpore*, which explains that there are 'two parts of philosophy, called *natural* and *civil*, concerned with 'two chief kinds of bodies', which are 'very different from one another'.⁹ The principal thing which these two sciences have in common, it seems, is that they are sciences: in other words, they employ essentially the same method in searching after the 'generation' and 'properties' of their respective 'bodies'.

The classic text for this line of interpretation is the passage in the Preface to the second edition of *De cive*, where Hobbes argues that 'every thing is best understood by its constitutive causes', and compares the analysis of the body politic to the taking apart of a watch. In the English translation of *De cive* the passage appears as follows:

Concerning my Method, I thought it not sufficient to use a plain and evident style in what I had to deliver, except I took my beginning from the very matter of civill government, and thence proceeded to its generation, and form, and the first beginning of justice; for every thing is best understood by its constitutive causes; for as in a watch, or some such small engine, the matter, figure, and motion of the wheels, cannot be well known, except it be taken in sunder, and viewed in parts; so to make a more curious search into the rights of States, and duties of Subjects, it is necessary, (I say not to take them in sunder, but yet that) they be so considered, as if they were dissolved. . . .¹⁰

In his recent book, Tom Sorell argues ingeniously that the real significance of this comparison is not the similarity which it suggests between physical and political investigation, but the dissimilarity. The comparison here, he notes, is not between a watch and a body politic but between a watch and a set of rights and duties—the difference being that the 'parts' of a body politic are individual people, but the 'parts' of rights and duties are jurat entities. He also notes that, while the watch is to be disassembled, the rights and duties are to be entirely 'dissolved' in thought:

this means that, while the physical scientist merely puts the real watch back together again, the political scientist can construct an ideal political entity of rights and duties as they should be.¹¹

Much of the reasoning with which Dr Sorell supports this argument is, I think, convincing. But as an analysis of the passage in *De cive* the argument fails, because it relies (as all previous commentators seem to have done) on the English translation. As I have indicated elsewhere, this translation was certainly not by Hobbes.¹² It is generally faithful, but often, as here, it blurs the details of Hobbes's argument. In the original Latin, Hobbes does in fact keep up a very close parallelism. The comparison is between the watch and the 'civitas'. In the one case we wish to investigate the function ('officium') of the cogs, wheels, etc.; in the other case we wish to investigate the function or office or duty ('officium' again—this is a sort of conceptual pun) of the citizens and the right ('jus') of the state. In the one case we take apart ('dissolvere') the watch; in the other case we do not actually take apart the state, but consider it as if taken apart ('ut dissoluta'). In the one case, in order to understand the function of the parts, we have to examine the material, shape, and motion of each of them; in the other case, we have to consider human nature, the ways in which it makes men draw together into a state and the exact way in which people must align themselves with one another if they are going to draw together.

By emphasizing the similarity between the two cases, I am contradicting Dr Sorell's textual analysis; but I think that emphasizing the similarity helps in the long run to confirm his general argument. Note first of all that Hobbes has not compared the state to a natural object such as a crystal or a sand-dune, which would be proper objects for investigation by the methods of physical science: he has compared it to an artefact, the nature of which can only be understood by understanding the intentions of the person who makes it or uses it. If you take a watch apart, you will find that one of its components is something called a governor, which turns the uneven motion of the unwinding of a spring into the even motion of the hands on the face of the watch. We could not understand the nature of the watch's arrangement of physical parts unless we understood what the governor was doing; and we could not have the concept of a governor unless we knew what watches were *for*. Of course, if a governor is to do its job it has to have certain physical properties: physics will describe the strength of the metal, the forces applied to it, the friction involved, and so on. The governor consists, after all, of nothing other than a piece of metal: there is no ghost in the machine. But a full physical description of it would not in itself give us the concept of a governor, any more than the physical description of a hemispherical metal object will give us the concept of a helmet or a cauldron.

⁷ J. W. N. Watkins, *Hobbes's System of Ideas* (London, 1965); M. M. Goldsmith, *Hobbes's Science of Politics* (London, 1966).

⁸ *Leviathan*, ch. 9, table. ⁹ *De corpore* I, § 1, p. 11. ¹⁰ *De cive* (English version), p. 32.

¹¹ Sorell, *Hobbes*, pp. 20–1.

¹² N. Malcolm, 'Citizen Hobbes', *London Review of Books* (Oct. 1984), p. 22.

What I am trying to suggest here is the simultaneous truth and inadequacy of saying that the watch consists of nothing other than metal and is therefore entirely reducible to a physical explanation of its nature. And the point which I am making is not the same as the point which is usually made about 'emergent properties' in the case of physical phenomena which are not artefacts. A ripple in a lake, for example, is an emergent property of water under certain conditions: we know that there is nothing there except water molecules, and we also know that to talk of ripples is to use a level of description which is simply not appropriate to the molecular level of reality. But the nature of a watch *quod* watch or of a helmet *quod* helmet is not an emergent property. It didn't just emerge—it was put there. And to describe it we need not just a different level of description but a different kind of description: description in terms of intentions. The same applies, I believe, to the nature of the state in Hobbes's theory.

A brief comparison may be permitted here with Mill, whose notion of a social science is in fact so reductivist that it hardly allows emergent properties, let alone intentional ones. In book six of the *System of Logic*, he announces:

The laws of the phenomena of society are, and can be, nothing but the laws of the actions and passions of human beings united together in the social state. Men, however, in a state of society, are still men . . . [They] are not, when brought together, converted into another kind of substance, with different properties; as hydrogen and oxygen are different from water . . . Human beings in society have no properties but those which are derived from, and may be resolved into, the laws of the nature of individual man.¹³

But we should be clear that Mill is talking here only about social science, not about politics or policy. At the end of the book he brings in a different level of knowledge, 'teleology' or the doctrine of values, and explains (although in fact he explains very little here) that it is on a completely different footing from the science of society which he has outlined. It makes use of the science of society just as an architect makes use of physics: the aesthetic values which shape the architect's design cannot themselves be derived from physical science. Although he leaves a great deal unsaid here, Mill does at least attempt a clean separation between fact and value—something which is sadly missing in the end from Hobbes's argument.

Returning to Hobbes's watch-analogy, it is worth noting, finally, that this passage from *De cive* resurfaces in the 'introduction' to *Leviathan*, where it is expanded into Hobbes's famous comparison between the state and an automaton or artificial man. Hobbes defines automata here as 'Engines that move themselves by springs and wheels as doth a watch'.¹⁴ Seeing the derivation of this passage from the watch-comparison in *De cive* helps us to see that the essential point about the 'artificial man' here is that it is artificial, not that it resembles a man—that

¹³ J. S. Mill, *System of Logic* (London, 1893), VI, 7, p. 573.

¹⁴ *Leviathan*, p. 1.

resemblance is an extra layer of analogy, added in *Leviathan* because of the increased importance in that work of the theory of the 'person' of the commonwealth.

In the 'Introduction' to *Leviathan*, Hobbes indulges in a fanciful and elaborate enumeration of the 'parts' of this automaton which he proposes to investigate: the wealth of the population is the artificial man's strength; the counsellors are its memory; reward and punishment are its nerves; and so on. Both qualities and physical parts are mingled promiscuously here: they are on a par with one another not in terms of a physical description of the automaton but in terms of the nature of the automaton as an artificial object, an object constituted by the intentions of the people who make it and use it.

In the passage in *De cive*, Hobbes said that he would investigate human nature and the ways in which it was apt to join together. Here in *Leviathan* he says the following:

To describe the Nature of this Artificiall man, I will consider

First, the *Matter* thereof, and the *Artificer* . . .

Secondly, *How*, and by what *Covenants* it is made; what are the *Rights* and just *Power* or *Authority* of a Sovereigne; and what it is that *preserveth* and *dissolveth* it.

Thirdly, what is a *Christian Common-wealth*.

Lastly, what is the *Kingdome of Darkness*.¹⁵

And there, in other words, is the four-fold plan of *Leviathan*. If we look at his summary of Part I of the work, we can see that it contains, quite compendiously, both sides of the critical debate about Hobbes's 'science' of politics. I will consider', Hobbes writes, 'First the *Matter* thereof, and the *Artificer*; both which is *Man*.' Hobbes's politics must therefore include both a science of human nature as the material of the state, and a science of human meanings, the ways in which men define and create the nature of the state as they fashion it out of that material.

Behind all this talk of material and workmanship, there hovers, quite naturally, an Aristotelian argument about the relation between 'matter' and 'form'. There is nothing covert or shameful about the presence of this conceptual model: in the original passage in *De cive* Hobbes actually uses the terms 'materia' and 'forma', when he says that he has proceeded from the matter of the state to its generation and form.¹⁶ Does this mean that Hobbes was betraying his allegiance to the 'new science' of mechanistic physics? Not at all. One way of putting the new scientists' objection to Aristotle's theory of formal causes would be to say that they felt that this theory involved imputing some sort of purposivity or intentionality to physical processes—an imputation which they believed to be superfluous or spurious. Hobbes, similarly, found the category of formal causation irrelevant to physical science. Yet there was no reason why he should abandon its use where the description of intentional actions was concerned: for this purpose it was ideally suited. The

¹⁵ *Ibid.*, p. 2.

¹⁶ *De cive* (Latin version), p. 79.

methods of physical science could be used to describe the 'matter' of the commonwealth. But physical science itself would not supply a concept of the relation between matter and form; and in order to analyse the form of the commonwealth in terms of the intentions of the people who made it, a rather different type of science was also necessary.

Hobbes found the model for this type of science in the science of geometry. The essential similarity was striking. Both sciences yielded universal truths by expressing the connections between conceptual entities: lines, circles, and squares, or rights, duties, and laws. To express the relationship between the sovereign and the citizens was to expound an analytic truth, similar to that which states the relationship between a circle and its radii. Unfortunately, however, beyond this type of immediate similarity there lay a very shadowy terrain of uncertain resemblances and shifting implications. The difficulties arose partly because Hobbes's views on the nature of geometry changed, and partly because he always tended to play down the peculiar status of the objects of geometry as conceptual entities, preferring to absorb geometry into a general theory about the nature of universal truths.

Hobbes's theory of universal truths was a product of his nominalism; and his nominalism was a good deal less extreme than is popularly supposed. He was a nominalist, not an arbitrary. Hobbes believed that all blue objects, for example, are really similar: our use of the same word to describe them is not a mere freak of human will or fancy. Indeed, his mechanistic theory of sense-perception ensures this, since the nature of the conception in our brains which we connote with the word 'blue' is caused directly by the motion of the object which we see. We experience objects as similar because they really do cause similar motions.

Hobbes defines a true proposition as follows: 'that, whose predicate contains, or comprehends its subjects, or whose predicate is the name of every thing, of which the subject is the name'.¹⁷ This definition is not directed simply at analytical truths of the sort, 'a bachelor is an unmarried man'. When I hold a blueberry and say 'this berry is blue', I satisfy Hobbes's requirements for a true statement: 'this berry' and 'blue' are both names of the thing I hold in my hand.

Apart from this sort of particular contingent truth, Hobbes also distinguishes between what might be called general contingent truths and universal necessary truths. 'All crows are black' is a general contingent truth. It is true because 'black' happens to be a name of the thing of which 'all crows' is the name. But if we found a white crow we would still call it a crow; so this is not a universal necessary truth. 'All crows are birds' is a universal necessary truth, because we could never find a crow which was not a bird.¹⁸ Hobbes is being something of a traditionalist here, setting up a hierarchy of levels of description. We might put it as follows. The real similarity connoted by the term 'bird' is a component of the more complex real

¹⁷ *De corpore*, III. 7, EW I, p. 35.

¹⁸ *Ibid.*, III. 10, p. 38.

similarity connoted by the term 'crow'. We cannot identify something as a crow without (early on in the process) identifying it as a bird. In *De corpore* Hobbes gives an example of this sort of cumulative recognition of similarities: as we approach an object from a distance, we see first that it is a body (i.e. corporeal), then that it is animate, then that it is rational: we 'compound' these concepts and arrive at the true judgement that it is a man.¹⁹

This sort of conceptual 'compounding', and its converse, conceptual resolution, provided the primary model for Hobbes's theory of resolutive-compositive method—a method which, I believe, owed almost nothing to Galileo and very little to the Paduan tradition of commentary on Aristotle. The use of the terms 'resolutio' and 'compositio' was immensely widespread, across a whole range of disciplines: they were simply the Latin equivalents of the Greek terms 'analysis' and 'synthesis', terms used in the Galenist tradition of diagnosis and prognosis, and in the Euclidean tradition of the methodology of mathematical problems.²⁰ Galileo's use of resolution and composition was concerned with the investigation of the causes of phenomena. Hobbes's conceptual resolution was concerned with causes only indirectly or equivocally. Indirectly in the sense that, when an observer perceives an object to be first corporeal, then animate, then rational, these perceptions are the causes of his knowing that it is a man. Equivocally in the sense that having those properties is the 'cause' of the object's being a man—this is a use of the word 'cause' which was outlawed, strictly speaking, by Hobbes's ontology.

Conceptual resolution of this kind involved little more than a progression through different levels of description; as such, it offered a much less fruitful model for a theory of scientific method than, for example, the use of 'resolution' to solve mathematical problems in the Euclidean tradition. Yet what appealed to Hobbes about geometry was its ability to yield new knowledge from an initial store of definitions and axioms. Ethics might resemble this form of science, since it was possible to resolve terms such as 'justice' into terms such as 'contract', and then to compound again in ways which might reveal hitherto unknown truths about what could or could not count as justice. But it was difficult to see how resolving and compounding the concept of a crow could tell you anything you did not already know about crows. Hobbes would have benefited, perhaps, from Locke's distinction between natural objects, whose nominal essences differ from their real essences, and conceptual objects (such as mixed modes and relations), where the nominal essence is the real essence.

¹⁹ *Ibid.*, I.1, p. 4; cf. William of Ockham, *Quodlibeta I*, qu. 33, in *Philosophical Writings*, ed. P. Boehner (New York, 1977), p. 90.

²⁰ See W. F. Edwards, 'Randall on the Development of Scientific Method in the School of Padua: a Continuing Reappraisal', in J. Anton, ed., *Naturalism and Historical Understanding: Essays on the Philosophy of John Herman Randall Jr* (Buffalo, NY, 1967), pp. 53–68; H. Schilling, *Die Geschichte der Axiomatische Methode im 16. und beginnenden 17. Jahrhundert* (Hildersheim, 1969) (esp. pp. 67–73); J. Klein, *Greek Mathematical Thought and the Origin of Algebra* (Cambridge, Mass., 1968) (esp. pp. 154–60).

Hobbes's early works gave the special status of 'science' only to those disciplines, such as geometry, which yielded universal truths. The knowledge of physical causes, on the other hand, belonged to the realm of experience, conjecture and hypothesis. After a few years in Paris in the 1640s, however, Hobbes began to include the knowledge of causes in his definitions of science. He may have been prompted to explore this direction of argument partly by the Mersenne circle's preoccupation with physical science, and more generally by the feeling that the physical causation of one event by another was the only category of fundamental explanation suitable for a universe consisting entirely of matter in motion. But one further reason for importing physical causes into the realm of true science may have been, paradoxically, Hobbes's desire to explain the special power of geometry to yield new knowledge.

The first signs of this new line of thinking come in the notes on Hobbes's philosophy made by Sir Charles Cavendish in 1645, and in the undated manuscript at Chatsworth, the 'Logica ex T.H.', which closely resembles Cavendish's notes and represents a draft of the early chapters of *De corpore*.²¹ In these accounts the description of philosophy or science is no longer concerned with attaining universal propositions through the use of settled definitions: 'Philosophy', Hobbes writes, 'is the knowledge of the properties of bodies, acquired by correct reasoning from the notions of their generations; and conversely the knowledge of possible generations, acquired by correct reasoning from known properties.'²² The distinction between natural science and other sorts of philosophy is maintained only in so far as the former is hypothetical: both are concerned with 'generation'. Now, the use of this word, instead of the word 'cause', gives a clue as to how this transition was effected in Hobbes's mind. For it is a word which, in his subsequent works, is characteristically used for geometrical figures when they are conceived of as products of the motion of a point. This way of conceiving of lines was being developed by geometers such as Roberval, who used it to solve problems involving complex curves such as spirals and trochoids. And it was precisely in this period (1643-5) that Hobbes became a friend of Roberval and developed an interest in this method: a discussion between the two of them on the comparison between a spiral and a parabola bore fruit in a demonstration which Mersenne published in his *Hydraulica* in 1644.²³

²¹ For details of these MSS see A. Pacchi, *Comenzione e ipotesi nella formazione della filosofia naturale di Thomas Hobbes* (Florence, 1965), pp. 29-30, 147-9; and J. Jacquot and H. W. Jones, 'Introduction' to Hobbes's *Critique du Monde de Thomas White* (Paris, 1973), pp. 83-7. Jacquot and Jones print a composite text of the MSS on pp. 461-83.

²² *Ibid.*, p. 465: 'Philosophia est corporum proprietatum ex conceptis eorum generationibus, et rursus generationum, quae esse possunt, ex cognitis proprietatibus, per rectam ratiocinationem cognita.'

²³ M. Mersenne, *Cogitata Physico-mathematica* (Paris, 1644), p. 129; see Hobbes's account of this discussion in *Six Lessons to the Professor of the Mathematics*, EW VII, p. 348.

In this way, Hobbes gained the heady satisfaction of arriving at unified theory of science, uniting the knowledge of universal necessary truths with the knowledge of causes: to know the *meaning* of the word 'circle' was to know what sort of motion of a point was the *cause* of a circle. But here Hobbes was sliding, as I have already suggested, into an equivocal use of the word 'cause'. The motion of a pair of compasses certainly causes a mark on a page; but what 'causes' that mark to be a circle is the equidistance of the resulting line from the central point, and this was a sort of causation which Hobbes had already denied to involve causes properly speaking. The idea of uniting the knowledge of necessary truths with the knowledge of causes was in the end a snare and a delusion, and this accounts for much of the floundering in Hobbes's later writings on the subject—writings which include not only the chapter on method in *De corpore*, but also *Leviathan*, where the definition of 'science' compromises awkwardly between knowledge of the consequences of names and knowledge of the consequences of facts.²⁴

According to this unsatisfactory unified theory, the only difference between the uncertain propositions of physics and the certain propositions of geometry and politics was that in the case of physics we hypothesize about how something might have been caused, whereas in politics or geometry we have certain knowledge because we have caused the object ourselves. This is not, however, an adequate distinction. It applies, for example, to the difference between finding a footprint in the sand, in which case one conjectures its cause, and making a footprint oneself, in which case one knows its cause. But the objects of geometry or politics have not just been 'made' by us in this contingent physical sense: they are intentional objects, constituted by the way in which we think of them.

To conclude: the distinction between two different types of science is reflected in Hobbes's actual practice, and in some of the methodological comments in his political writings—notably the distinction between the 'matter' and the 'form' of the commonwealth. But his own theoretical writings on the nature of scientific knowledge became more and more misleading as guides to his actual practice, because of his obsession with providing a unified theory of science. Hobbes's confusions have been (understandably) reflected in the confusions of his commentators, who have tried either to confine his theory of science to one of the two varieties, or to show that both varieties were based on a single underlying pattern of scientific method. Hobbes's formal science of rights and obligations assumes the existence of a human nature which can be described by a mechanistic science of causes; but it is not itself a product of that science.

²⁴ *Leviathan*, p. 21: 'till we come to a knowledge of all the Consequences of names appertaining to the subject in hand; and that it is, men call Science. And whereas Sense and Memory are but knowledge of Fact . . . Science is the knowledge of Consequences, and dependance of one fact upon another . . .'