

Introduction

Humanism, as a scholarly movement, emanated from Italy in the fourteenth century; it soon spread throughout Europe, from Paris and Oxford in the west to Cracow in the east, and reached the height of its influence in the sixteenth century. Though at first it had been a literary movement, centred upon poetics and rhetoric, the increasing exploration of the whole of ancient learning led to the promotion of knowledge and understanding in practical fields too. This applies not just to the arts, but in particular to the technical and practical sciences, which have received far too little attention as parts of this process. The body of knowledge in the fields of jurisprudence, medicine, astronomy, cosmography, geography, mining, mechanics, architecture and agriculture was built up systematically from the standard works of Greek, Byzantine and Latin scholarship; finally men drew upon the experience of antiquity in the fields of warfare and the structure of the state. The relevant texts were repeatedly published in new and improved editions, furnished with commentaries, and translated into modern languages. This was due not to literary and aesthetic interest, but to practical considerations which had to do with contemporary needs and the wish to apply immediately the knowledge supplied by the texts.¹ With regard to medicine we may cite a single set of figures for the sixteenth century: between 1490 and 1597/8 six hundred and sixty editions of Galen were published (eighteen of them complete), chiefly in Paris, Lyons, Venice and Basle. The peak of this publishing activity came between 1525 and 1560.² The scientific encyclopedia of Pliny the Younger, *Historiae naturalis libri*

¹ The major histories of science often pay scant attention to the connections between classical and modern science. For the view of a historian of ideas cf. E. Cassirer, 'Die Antike und die Entstehung der exakten Wissenschaft', *Die Antike* 8 (1932) 276–300. See also G. Harig, 'Die Aneignung des antiken Wissens auf dem Gebiet der Naturwissenschaft in der Renaissance', J. Irmscher (ed), *Renaissance und Humanismus in Mittel- und Osteuropa*, Berlin 1962, vol. 1, pp. 3–15; L. Olschki, *Geschichte der neusprachlichen wissenschaftlichen Literatur* (3 vols), Heidelberg 1919–27; M. Boas, *The Scientific Renaissance 1450–1640*, London 1962; A. C. Crombie, *Augustine to Galileo*, 2 vols, London, ²1961. A. Buck, 'Der humanistische Beitrag zur Ausbildung des naturwissenschaftlichen Denkens', *Die humanistische Tradition in der Romania*, Berlin 1968, pp. 165–81. For a summary see G. Sarton, *The Appreciation of Ancient and Medieval Science during the Renaissance (1450–1600)*, Philadelphia 1955.

² R. J. A. Durling, 'A chronological recensens of Renaissance editions and translations of Galen', *Journal of the Warburg and Courtauld Institutes* 24 (1961) 230–305.

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XXXVII went into at least forty-six editions by 1550. Euclid's *Elementa geometrica* were printed forty times in full or in part by the same date, and during the same period there were thirty-two editions of Discorides' *De materia medica*.³

The links between classical literature and the practical science of early modern times must be viewed within the framework of a broad general development. Intensive study of the ancients and immersion in their works initiated an important process whose effects persist into our own age – the scientific study of many practical activities which had been carried on for a long time and handed down in a practical manner. By being treated systematically, certain areas of work became branches of learning; their subject-matter was condensed into manuals and works of reference used for instruction by universities, schools and private tutors. They were not yet treated in the purely theoretical and scientific manner of the ivory tower; on the contrary, the new humanistic learning served practical ends, and in the process its content underwent great changes.

One instance of this, the one that has hitherto received most attention, is the reception of Roman law in the sixteenth century. The *Corpus Iuris* was first studied in Italy in the High Middle Ages, then in the Holy Roman Empire, whence it ultimately spread to other continental states.⁴ Opinions differ as to the significance of this development for the legal culture and the social and political conditions of the individual countries of Europe. Modern legal historians no longer see as its chief result the taking over of specific procedures, but the cultivation of scientific legal thinking. The symbolic figure in this continental revolution is the jurist trained in Roman law who replaced the jury, the lay magistrate and the untrained official in the spheres of justice and administration.

The cultivation of a scientific approach to other wide areas of practical life in the sixteenth and seventeenth centuries appears to be similarly bound up with the influence of the classics. Here we may cite a few examples to represent the whole field of knowledge. Niccolò Tartaglia (1499–1557), one of the foremost mathematicians of the sixteenth century, who addressed himself to the technological problems of his age, made a study of Archimedes and Euclid the basis of his *Scientia nova*, just as Rafael Bombelli, summarizing contemporary knowledge of algebra, relied upon the newly rediscovered Diophant of Alexandria, whose work he translated from the Vatican codex.⁵

The modern science of mining goes back to Georg Agricola (1494–1555),

³ For a general survey see F. Russo, *Éléments de bibliographie de l'histoire des sciences et des techniques*, Paris 1969. Also A. Koyré, 'Les sciences exactes' in R. Taton, *La Science moderne (de 1450 à 1800)*, Paris 1958. (On Apollonius, Archimedes, Pappus, etc. see p. 27, n. 1; for the *Almagest* of Ptolemaeus, see pp. 53f.)

⁴ P. Koschaker, *Europa und das römische Recht*, Munich/Berlin 1958, pp. 38ff.

⁵ L. Olschki, op. cit. (n. 1), vol. III, pp. 77ff. and 105ff.

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who laid the foundations of the four branches of the subject – mining proper, metallurgy, mineralogy and geology. His principal work, *De re metallica* (1556) was repeatedly reprinted until the eighteenth century. H. Wilsdorf has calculated that in the 450-odd pages of Agricola's work there are approximately 1575 references to ancient sources. At the same time Agricola has a clear tendency 'to cite ancient historians and poets as little as possible and ancient physicians, naturalists and philosophers as extensively as possible'.⁶ From the material of classical scientific and medical literature Agricola built up a corpus of knowledge which served contemporary interests and helped in the performance of practical tasks. This German humanist wanted, in his own words, to do for mining what the Roman Columella had done for agriculture.

The extensive Greek and Roman literature on husbandry was already known in the Middle Ages. From 1472 there had been a collection of *Scriptores rei rusticae*, compiled from the works of Columella, Palladius and Varro, but it was only in the sixteenth century that husbandry came to be developed scientifically as a result of the study and updating of classical works on agriculture. In 1529 there appeared the standard edition of *Geoponica*, the authoritative Greek work on agriculture. Two years later the Florentine humanist Vettori published the standard critical edition of the Roman *Scriptores rei rusticae*. Both works were subsequently translated into various vernaculars. Cato, Varro and Columella, the great Roman authorities on agriculture, were extensively studied and imitated, as were Pliny and Xenophon. Their works, either in the original or in translation, were to be found in the libraries of the European nobility, who, as the landowning class, devoted assiduous study to their principal source of income.⁷

The agricultural boom of the sixteenth century was accompanied by a great intensification and rationalization of agriculture. Viticulture and fruit-farming were developed systematically along the lines indicated by Columella, and these set the pattern for other kinds of farming. In Italy, Spain, France, England and Germany we find scientific works which draw upon ancient writings, while at the same time taking account of special regional conditions. On the planning and economic organization of the *villa* Alessandro Piccolomini, in his work on the education of the nobleman (1542), made 'Columella, Pliny and, above all, Xenophon the teachers of the present day'.⁸ Thus began the scientific practice of husbandry. Notable French treatments of the subject are the Latin *Praedium rusticum* of Carolus Stephanus, which was translated into French as *Maison rustique* and then

⁶ H. Wilsdorf, 'Die Auseinandersetzung der Humanisten mit der Antike beim Aufbau der Bergbaukunde', in J. Irmscher (ed), *op. cit.* (n. 1), pp. 201–17.

⁷ O. Brunner, *Adeliges Landleben und europäischer Geist*, Salzburg 1949, pp. 260–80. Brunner classifies agriculture among the 'technical' sciences which are based on classical knowledge.

⁸ A. Buck, *op. cit.*, p. 296.

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into other modern languages, and the *Théâtre d'agriculture* of Olivier de Serres, which became the classic work on agriculture in France and went into twenty-one editions between 1600 and 1804. Comparable works appeared in Germany – *De re rustica* (1570), by the humanist lawyer and landowner Conrad Heresbach, and the *Opus oeconomicum* (1593–1603) of Jacob Coler, a professor of theology; this work ran to fourteen editions.

Here, however, we become aware of the limits to the adoption of the experience of the ancient world: the Roman literature on the *villa* was an appropriate model of agrarian rationalization for the great landowner, whose estates were run for the marketing of his products, but not for the large class of smallholders, who were now placed at an even greater disadvantage.

The end of the sixteenth century also saw the start of a scientific approach to warfare. In this field the Dutch army reforms probably afford the best instance of the systematic investigation of certain questions raised in classical times and its application to the urgent tasks of the present. With a view to the systematic training of troops, a task not attempted before, the Dutch reformers studied the ancient drill procedures;⁹ for army organization they studied that of the Romans; they also studied the moral basis for the efficiency of the ancient armies and produced the new Dutch articles of war, following the model of the Roman *disciplina militaris*.¹⁰ The result was the much admired army of the House of Orange, which became a model throughout Europe.

Contemporary philologists contributed much. Dutch professors such as Sixtus Arcerius and Johannes Meursius made new editions of the writings of Aelian and the emperor Leo VI; from these came, among other things, the language of drill. From *ad hastam declina* we get the German *rechts um!*, the English 'to the right' and the Scots 'richt about', and from *ad scutum declina* we get the German *links um!*, the English 'to the left' and the Scots 'left about'.¹¹ The works of Greek and Roman historians were combed for pronouncements on military science, and these were compiled for practical use in large collections running to several volumes.¹² Vegetius was edited and re-edited throughout the sixteenth century.¹³ The reformers demanded

⁹ Count William Louis of Nassau reported to Prince Maurice of Orange-Nassau on the training of Dutch troops according to the prescriptions of Aelianus and the Emperor Leo VI of Byzantium from Groningen on 8 December 1594. Most recently printed in W. Hahlweg, *Die Heeresreform der Oranier und die Antike*, Berlin 1941, pp. 255–64.

¹⁰ Cf. the article 'Disciplina militaris' in Pauly, *Realencyclopädie der classischen Altertumswissenschaft* v, 1, col. 1175–83.

¹¹ Cf. W. Hahlweg, *op. cit.* (see n. 9), pp. 279ff.; id. (ed.), *Die Heeresreform der Oranier. Das Kriegsbuch des Grafen Johann von Nassau-Siegen*, Wiesbaden 1973, pp. 120–5.

¹² For instance the celebrated humanist Janus Gruterus published in 1624 two folio volumes (over 2,000 pages) of classical writings on warfare.

¹³ A collection of writings on warfare (including Vegetius, Aelianus, Frontinus, Modestus and Onosander) appeared in 1487.

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new and better translations of Greek works into Latin, in order, for instance, the better to understand Polybius. Numerous translations and descriptions of ancient military organization soon appeared in all the main languages of Europe. The Cannae studies of Count William Louis of Nassau provided models for military strategy.¹⁴

Imitation of the ancients, in this and other spheres, did not mean blind adoption, but critical adaptation and transformation. The scientific approach to military organization and warfare, tactics and strategy, began under the tutelage of the ancients. However, a new spirit arose, a new code of behaviour based on an ancient pattern, which contributed greatly to successes on the field of battle. One of the most important agents in the transmission of Roman stoicism was the Dutch professor Justus Lipsius, whose treatment of military affairs in the fifth book of his *Politicorum libri sex* (1589) had first stimulated the Dutch army reforms. Lipsius subsequently supplied a further basis for the study of modern warfare in two specialized works, *De militia romana*,¹⁵ a commentary on Polybius (1595–6), and *Polioreticon*,¹⁶ a description of ancient combat technique.

From Lipsius we can trace a further line of development to modern political science and the theory of the state. For some time it has been customary to regard the later phase of humanism as a scholarly movement which concerned itself with practical affairs and whose concrete aim was to help constructively in settling the profound political and religious crisis which developed in the age of the religious wars. Throughout the Middle Ages, politics was taught as one of the three branches of practical philosophy, the other two being economics and ethics, and based on Aristotle. It thus remained largely in an abstract framework. In the course of the sixteenth century, Athens receded into the background and interest was concentrated on Roman institutions, since the structure of the early modern state demanded a different scientific orientation. Now it was the Roman political thinkers and historians, foremost among them Tacitus, who supplied the basis for the scientific treatment of practical politics.¹⁷

With Machiavelli and Guicciardini began a stream of reflections on a modern art of government. As in the military reform of about 1600, so in

¹⁴ G. L. de Nassau, *Annibal et Scipion ou les grands capitaines*, The Hague 1675, ed. by A. C. de Mestre.

¹⁵ The fifth edition appeared in 1630. There were 1,500 copies of each of the first three editions, and in all 6,325. See *Bibliographie Lipsienne, Œuvres de Juste Lipse*, Ghent 1886, vol II, pp. 113–25.

¹⁶ The fourth edition appeared in 1625. The first three editions were of 1,500 copies each, in all 5,275. See *Bibl. Lipsienne* II, pp. 319–32.

¹⁷ On the study of Tacitus up to the second decade of this century see G. Toffanin, *Machiavelli e il 'Tacitismo'. La 'Politica storica' al tempo della controriforma*, Padua 1921. Later studies include: A. Momigliano, 'The first political commentary on Tacitus', *Contributo alla storia degli studi classici e del mondo antico* I, Rome 1955, 37–54; J. von Stackelberg, *Tacitus in der Romania*, Tübingen 1960; E.-L. Etter, *Tacitus in der Geistesgeschichte des 16. und 17. Jahrhunderts*, Basle 1966; E. T. Galvan, 'El Tacitismo en las doctrinas políticas del Siglo de Oro Español' in id., *Escritos*, Madrid 1971, pp. 11–93.

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the development of the modern state, Dutch philology had an important part to play. Again the chief figure was Justus Lipsius, with his *Politicorum libri sex*, which we have already mentioned. In the main this work was a collection of aphorisms from ancient historians and philosophers, treasuries for the practical statesman. The real facts of Roman life – administration and the structure of the financial and fiscal apparatus, as well as the ethical and spiritual foundations of the Roman state – were objects of intensive study and provided an important starting point for the shaping of the early modern state. The political and moral values of Rome, foremost among them *auctoritas* and *disciplina*, became fundamental to the historico-political thinking of the age. More than anything else, the notions of *auctoritas* and *disciplina* dominated the public institutions of the incipient age of absolutism.

The structure of the state and the army, as well as the life led by the upper classes, conformed to the ancient pattern. The purely political interest in Tacitus was now complemented by the rediscovery of Seneca and the development of Neostoicism, both of which were given a largely practical and pedagogical orientation. The virtue of *constantia* became symbolic of the new system of values, which was based partly on Roman moral thinking, partly on Stoic psychology, and partly on practical Neostoicism. In personal affairs too the emphasis was placed on the practical art of living, not on abstract reflection. In all the countries of Europe the seventeenth-century ideal was the ‘political man’, embodying practical wisdom and *savoir-vivre*. Institutional, political, economic, constitutional, legal and intellectual history all converge in this ideal.

For Max Weber the whole of European development was characterized by the process of rationalization. This process received a special impetus in the sixteenth and seventeenth centuries. The systematic approach to the problems of the age led to the scientific development of statecraft and the arts of war, administration and education, farming and technology. The scientific approach to all these spheres of activity was the outcome, not of individual reflection and creativity, but of receptivity to impulses from the world of antiquity. Classical philology shook off its restrictive links with the narrow class of those who had enjoyed a classical education and broadened its scope to embrace practical science, thus becoming an academic discipline for a much wider class.

The influence of such practically orientated classical studies had important consequences, not just for the development of the individual disciplines, but for the practical aspects of the corporative state, absolutism and enlightenment, with their economic, social and cultural life. It ought to be possible, in a comprehensive cultural synthesis, to demonstrate the continuity of man’s practical and moral experience, despite the intervening

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crises and changes, and also to provide a further justification for contemporary interest in the world of antiquity, by taking a look at practical affairs, practical science, and the behaviour of the individual and society. In what follows I must confine my study of Justus Lipsius to a consideration of the state, the army and the 'political man'. This, however, introduces us to a vital part of the history of scholarship, for an insight into the spirit of the state and its apparatus of power affords in some measure a reflection of the condition and behaviour of the mass of the population and of the mentality of the age.

Neostoicism was an important and constructive element in the political thought at the turn of the sixteenth century. Its aim was to increase the power and efficiency of the state by an acceptance of the central role of force and of the army. At the same time, Neostoicism also demanded self-discipline and the extension of the duties of the ruler and the moral education of the army, the officials, and indeed the whole people, to a life of work, frugality, dutifulness and obedience. The result was a general enhancement of social discipline in all spheres of life, and this enhancement produced, in its turn, a change in the ethos of the individual and his self-perception. This change was to play a crucial role in the later development of both modern industrialism and democracy, both of which presupposed a work ethic and the willingness of the individual to take responsibility.

In the last decade of the sixteenth century the states of Europe, riven by confessional and political conflict and threatened with disintegration, received a twofold impulse from the Neostoic political philosophy of the Netherlands. In the first place it gave a great boost to the methodical ordering of national affairs by injecting into political life a new intensity and dynamism founded strictly on reason. It encouraged the rulers to assume an educative role and to bring many areas of public life under the control of the state for the first time. It would be wrong, however, to speak of 'early rationalism' in the eighteenth-century sense, since Neostoic reason (*ratio*) embraced not only *pietas*, but even *fortuna*. Neostoicism was far from being a doctrinaire movement, as we see from its approach to the two main problems of the day – those of religion and privilege. The estates, for instance, were not opposed as a matter of principle, but only insofar as they resisted the establishment of centralized power. In the second place, classical philology, which had developed into a comprehensive study of the ancient world and given birth to political humanism, put its findings at the disposal of the state and helped in the build-up of its power. Roman military organization and warfare and Roman governmental and fiscal practice in the age of the Principate supplied models to be imitated directly or indirectly. Roman Stoicism, as reconstructed by Lipsius, furnished a philosophical basis for a change in mental and spiritual attitudes; these led

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to a positive acceptance of permanent state power, which was embodied in the standing army. The prince, the civil service and the military were the pillars which supported the modern centralized state. They adopted the Roman doctrines of virtue and duty and constituted a secular counterpart of the Church Militant.

Western Christendom, split into two – indeed three – conflicting confessions, was once again linked with the world of antiquity by a broad group of theoretical and practical scholars, among whom the Netherlanders Erasmus, Lipsius and Grotius stand out like the tips of an iceberg. This potent symbiosis replaced the profound religiosity of the Middle Ages and paved the way for a Christian attitude which was confessionally neutral and remained firmly rooted in the religious tradition of the west. Humanism and Neostoicism ushered in what has been called the ‘Roman century’ and impressed their stamp on the culture of the whole period. They freed the Protestant world, earlier than the Catholic, from the chains which the Church had imposed upon itself and, with Machiavelli as a forerunner, constituted an intermediate stage in the progress towards secularization.

Neostoicism considerably strengthened the rational and ethical tendencies of the age, helping to fix them in the general consciousness and transforming them into a broad philosophical attitude. It did not, of course, present a methodically perfect system of thought comparable to the self-contained systems of Descartes, Hobbes, Spinoza and Leibniz. For this reason it is generally given short shrift in the history of philosophy, even though it did represent a powerful current which ultimately led, in the eighteenth century, to the freeing of rational philosophy from all religious ties and to English and French moral philosophy. As a practical guide to the art of living Neostoicism gained a direct hold over the individual, and as a philosophical attitude it worked alongside Calvinism and Jesuitism, the most powerful religious forces of the day, to influence the most varied aspects of life – literature and law, education and society, the economy and the military. Stoicism was an international spiritual and intellectual movement which was able to cross the boundaries of the conflicting confessions and so create a neutral base. Historians of literature, as a result of renewed research into Baroque culture pursued since the First World War, were the first to recognize and bring out the general significance of this movement.

The fact that the seventeenth century became essentially a ‘Roman’ period, that Seneca and Tacitus were the chief witnesses on philosophy and history in the age of the Baroque, and that Machiavelli’s conception of a state based on power eventually came to fruition in an entirely changed world – all this seems to me to go back to Lipsius. After painful personal experience he acknowledged the necessity of power, carefully investigating

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its scope and providing it with a solid moral foundation in Neostoicism. He sought not only to discipline power and authority, but to limit them. His 'mirror of princes' appealed to the *prudentia* of the leading personalities in the state and the army and called for *vis* to be restrained by *virtus*.

The spiritual conflicts and mental contortions of contemporary theology, the military confrontations and the cost in human lives on all sides, the permanent state of inhumanity, insecurity and misery, of flight and exile, created the basic conditions for the widespread adoption of the ideal of humanity, an appeal for humane attitudes and conduct in all those who felt themselves threatened by the religious wars and their consequences. The claim to human dignity and the aspiration for freedom seemed to be guaranteed and satisfied by the demands for the controlling of the passions and the urge for power, for self-inspection and discipline, tolerance and moderation.

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PART I

Justus Lipsius and the Netherlands
movement