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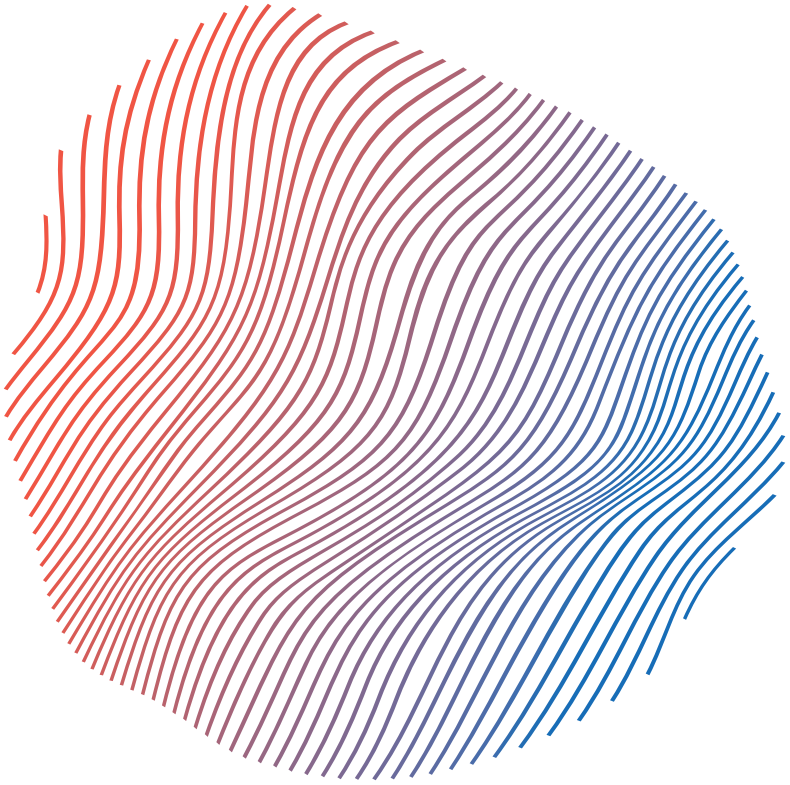

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hiip://www.accademiasantagiulia.it
Via Tommaseo, 49, 25128 Brescia (Italy)
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Humanists and Technology

Research Notes on a Paradoxical Relationship

By Carlo Susa (Accademia di Belle Arti di Brescia SantaGiulia)

If it is true that words remain tied to their origins even when they appear to drift away from them, this principle holds all the more for a term like humanism, which—despite having undergone countless attempts at reformulation over the past few centuries—can never fail to evoke, in those who read or hear it, that specific spiritual and cultural attitude toward the study of ancient texts and the historical period—roughly between the early 14th and early 16th centuries—in which it took shape. Today, the term is used widely and in varied ways—sometimes with full awareness, sometimes carelessly—often as though its mere evocation could alone serve as a solution to the aporias characteristic of our era. An era in which ts located in the contents and outcomes of the writings and research of Galileo and his contemporaries, the question of what relationship humanists might have had with technology can seem baseless.

In the humanities, however, problems are more complex than they appear when principles of logic are applied to simple definitions. Even though it is widely accepted that modern scientific thought developed from the 17th century onwards, a scientific approach to natural domains is much older. The importance of Greek philosophy in the development of Western scientific thought is now universally known and acknowledged. Less well known is the contribution of medieval thinkers; yet after the publication of Edward Grant's seminal study on the subject, any attempt to outline a history of science that perpetuates the most trite legends of a superstitious and faith-bound Middle Ages can no longer be taken seriously.[2] Grant's study in particular allows us to consider a historical phenomenon of special relevance to the theme of this essay: the period we now call humanistic was the very one in which the foundations of modern scientific thought were laid. And if it is true that only in the seventeenth century was an organic conception of a thought based on experimental practice reached, the keenest thinkers of the fourteenth and fifteenth centuries were able to glimpse what the growth would be of the seed that had been sown in their time.

Naturally, this alone is not enough to fully address the question of the relationship between humanists and technology. The concept of technology, in fact, only fully developed in a later era. It is true, however, that many manifestations of what we now call technology were already evident in antiquity. In particular, the construction of machines perceived as prostheses—extensions or enhancements of human limbs and actions—is a process known since the great archaic civilizations (consider, for example, war machines or those used to build monumental architectural structures).[3] Even in this respect, the humanistic period marks a fundamental qualitative leap in the

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history of Western technology, with the appearance of the first 'automatic' machine: the mechanical clock, whose invention and early diffusion date back to the period straddling the 13th and 14th centuries. Until then, timekeeping had relied on the observation of natural phenomena or, in any case, on devices powered by natural forces and elements. The mechanical clock, by contrast, was a self-moving artifact capable of measuring time more precisely than previous systems. This led some intellectuals of the time to reflect on the role of machines and technology within the divine plan—to the point that Nicole Oresme, Bishop of Lisieux and one of the greatest thinkers of the 14th century, described Creation itself as something comparable to the construction of a self-moving clock.[4]

In addition to the mechanical clock, the late Middle Ages saw the emergence of many other technological innovations that radically changed people's living conditions, the methods and rhythms of work, and at times even the landscape. Among these, we may briefly mention: the vertical windmill, the hydraulic hammer, the blast furnace, certain firearms such as the cannon and the handgonne, eyeglasses, and the movable-type printing press. Contrary to the image often portrayed, then, the world in which the humanists lived was—by the standards of the time—in rapid transformation, and within that context, technological innovations played a fundamental role (in this light, we might say it bore some resemblance to our own). It is therefore meaningful to ask what attitude the humanists held toward these phenomena. While we cannot, in this space, explore the topic in the depth it deserves, we will limit ourselves to offering the reader a few simple 'snapshots' of how three renowned humanists approached the theme of the relationship between humans and technology, as a way to briefly outline what appear to be the main tendencies of that cultural current.

Petrarch Against the 'Mechanical Arts'

Francesco Petrarch, as is well known, was not only one of the greatest poets in Italian literature but is also almost unanimously regarded as the first humanist in history—the archetypal figure of the movement—for his tendency to explore the nature of the human soul through the ideals of classical antiquity, for his antiquarian passion in seeking out ancient texts, and for his approach to interpreting them historically rather than allegorically, as had been the norm for many centuries before him. His example would be followed by the humanists of the following century, who in many cases would adopt and deepen his approach to the study of texts, his intellectual positions, and his cultural references. In this sense, his polemic against the so-called 'mechanical arts' holds fundamental importance in outlining the humanist stance toward fields of knowledge that today we associate with science and technology.

To understand this polemic, it is necessary to consider the intellectual climate in which it emerged. Petrarch appeared, in the 14th century, within an Italian and European cultural landscape dominated by universities and by philosophical currents such as Ockhamism and Averroism, which—though in different ways and with different emphases—tended to ground intellectual inquiry in logic and material evidence, at the expense of metaphysics. Making due allowances for the differences between eras, Petrarch found himself confronting cultural trends that bore a certain resemblance to positivist and scientistic thinking, and he soon came into conflict with them. The opportunity arose from an anony

mous physician at the papal court who, in polemical response to some advice Petrarch had offered the Pope, argued that poetry was useless, being an illogical and abstract form of expression. Petrarch responded with the fiercely written Invectivarum contra medicum quendam libri IV (1355), in which he vigorously defended the traditional primacy of the liberal arts (Grammar, Dialectic, Rhetoric, Arithmetic, Music, Geometry, and Astronomy) over the mechanical arts (which included Armor-making, Medicine, Hunting, Wool-working, Navigation, Performance [Theatrica], Architecture, and Painting—roughly corresponding to our modern technical-artistic disciplines and the natural sciences).

In these invectives, addressing the physician directly, Petrarch denies Medicine—classified as a mechanical art—the capacity to contribute to a profound understanding of the human being: "Do your job, mechanic, I beg you, if you can; heal bodies if you are able, or else kill them, and be paid the price of your crime."[5] Even though the conceptual and hermeneutic frameworks are not yet those familiar to us, it is as if the poet confines medicine's role to intervening upon the body—as matter and as 'machine'—while reserving to the liberal arts the ability to investigate the soul and the deeper meaning of humanity.

Also thanks to such positions taken by Petrarch, a cultural vision would develop in Europe—and especially in Italy—based on the separation and dialectic between the human sciences and the physical-natural sciences, a distinction that originated in humanism and has persisted into our own time.

Ficino and the Inquiry into Nature and Technology

The harshness of tone used by Francesco Petrarch should not lead us to believe that humanists were entirely closed off to the natural sciences and technology. Among the most significant humanist figures to have extensively addressed these topics is the Florentine Marsilio Ficino, whose positions fall squarely within a well-established medieval tradition. This tradition, beginning with the Benedictine valorization of manual labor, had re-evaluated knowledge of nature and the mechanical arts. It extended throughout the Middle Ages to the so-called "Renaissance of the 12th century" and culminated in the grand theorization of Hugh of Saint Victor who, in his Didascalicon, defined science as "the collection of technical arts which encompass all human labor and are rightly called mechanical in the sense of imitative [according to the Greek etymology of the term]," situating them among the activities that can bring man closer to God.

Ficino inherits the fruits of this intellectual tradition and integrates them within the humanist approach and his ambitious attempt at reconciliation between the ancient pagan religious tradition, Jewish thought, Greek philosophy, and Christian theology. In his effort to uncover and theorize a docta religio—a learned religion that could serve as a synthesis of these diverse cultures—he presents a view of nature rooted in Pythagorean-Platonic principles. This view posits the existence of a pre-established harmony between the microcosm (man) and the macrocosm (the universe), suggesting a perfect correspondence between human mental activity and reality. This correspondence is substantiated by mathematics, which thus becomes the expression of the precise rhythm and proportions through which God created

the cosmos. As one might infer, this conception of nature and of a "mathematical God" would later be taken up by major figures of the modern era, among them Leonardo da Vinci and Galileo Galilei.

Within this framework, the mechanical arts take on great significance, since their products—that is, human creations—reflect the harmony of divine creation. In his monumental Platonic Theology (1482), Ficino reflects on the story of Daedalus and Icarus, which—alongside the biblical tale of the Tower of Babel—was one of the narratives that most inspired late medieval thinkers and artists in considering the potential of human ingenuity and the role and limits (both moral and physical) of technology.[6] In Ficino's reading of the myth, the optimistic celebration of Daedalus' ingenuity clearly outweighs the moral lesson tied to Icarus's fatal destiny. This position is closely related to the analysis that the Florentine humanist conducts on the value and inner nature of technical-artistic products, in which he writes: "Man imitates all the works of divine nature and perfects, corrects, and amends the works of inferior nature." In this sense, "man's capacity is therefore almost akin to divine nature, in that man governs himself—that is, by his own prudence and art—being in no way constrained by the limits of corporeal nature, striving to emulate all the works of higher nature."[7] The correspondence between human thought and divine creation thus renders the products of human ingenuity as creations 'in the image and likeness' of those of God.

The passion for associating words and images is typical of the sixteenth-century taste for emblematics. In this context too, it is worth noting that Manutius was among the pioneers in the creation of what we would now call a "logo"—that is, a symbol associated with a commercial enterprise. The famous trademark of Manutius's printing house, which pairs the motto "Festina lente" ("Make haste slowly") with the image of a dolphin wrapped around the vertical shaft of an anchor, is particularly significant in light of the themes discussed here. It reflects a typically humanist origin—Manutius derived it from an ancient silver coin issued by Emperor Vespasian and gifted to him by Cardinal Pietro Bembo—and it embodies the idea of a paradoxical interaction conveyed through both the words and the image.

Elements Useful to the Debate on the Concept of "Technological Humanism"

At this point, to offer a contribution to the debate around defining the concept of "technological humanism," we can, in conclusion, try to extract some meaningful elements from the "snapshots" of the three great humanists discussed here, elements that might help reconstruct a possible outline of the implicit attitude humanist intellectuals maintained toward technology.

Petrarch's polemic against the physician, seen as a representative of the mechanical arts, can be interpreted—within the humanist approach to different forms of culture—as an indicator of a specific form of discernment. Humanism examines reality by focusing "naturally"—so to speak—on an idea of humanity, which it seeks to understand by filtering out the impact of fleeting trends, aiming instead to define a meta-historical concept. For humanist intellectuals, the ancient authors and their works embody a vision of humanity whose value is at least equal to that of the moderns—if not greater, being considered clearer and closer to the origin. As a result, they related to classical authors as if they were contemporaries. This attitude enabled a kind of estrangement

from the spell of novelty and its claim to absolute relevance. No matter how extraordinary, modern inventions could never fundamentally alter the meta-historical nature of humanity; at most, they might exaggerate certain aspects, thereby leading humanity away from its true nature.

It is no coincidence that it was Petrarch who inaugurated the modern historical perspective, moving beyond the ancient and medieval view of history as a collection of notable facts. For him, historical documents should not be taken for granted. On the contrary, they must be "isolated" from contemporary opinion in order to be examined with philological rigor, allowing one to determine their authenticity or falsity.[11] This detachment—from both one's own time and the object of inquiry—is a necessary condition for meaningful investigation and sound judgment. Extending this principle to the relationship with technological inventions, one could say that for the humanist, technology must be viewed within a historical perspective, centered on an idea of humanity that transcends the transient values of each era.

This idea of a meta-historical humanity, within the Neoplatonic perspective shared by many humanist intellectuals, is understood as being intrinsically connected to Creation and its laws, of which it is an integral part. From this stems Marsilio Ficino's attitude toward the mechanical arts which, although it may seem to contrast with that of Petrarch, can in fact be interpreted as a complement to it. As suggested by Nicole Oresme's image of the universe as a clock, for Ficino, technology is a human endeavor created in the image and likeness of divine creation, and in this sense, it should be regarded as a kind of continuation of it. An implicit aspect of this reevaluation is that such a vision remains valid only if the "mechanical man"—what we might now call the technological man—designs his works in harmony with the laws that govern both the universal macrocosm and the human microcosm. When this harmony is achieved, the technological man becomes a successor to the divine act of Creation, like the great genius Daedalus. However, when this is not the case—when the human project develops in a disharmonious way—his work instead falls into line with that of the builders of the Tower of Babel, animated by the same hybris and doomed to the same failed outcome.

The logical and historical consequence of these premises is perfectly represented by the case of Aldus Manutius, the humanist intellectual who aligns his thought with technology in order to carry out his cultural project much more effectively. This 'marriage,' contrary to what might be thought today, was by no means easy to achieve. As previously mentioned, Manutius was forced to modify his original editorial project to make it economically sustainable: this choice may seem obvious to us now, but for an intellectual living at the crossroads of the 15th and 16th centuries, steeped in Neoplatonism and thus in concepts tied to an idea of perfection to be reached, such a decision must have been deeply painful. To what extent should one conform to the demands of one's time? How far could the 'magnificent isolation' of humanism be broken? The solution Manutius found to these questions is magnificently expressed by the symbol of his editions. Hastening with slowness, or keeping pace with the modern world while still paying the utmost attention to what one does, is the effective synthesis of his way of understanding the attitude that should underpin a cultural endeavor. At the same time, the interaction between a machine that guarantees firmness and stability, like the anchor (or movable type

printing), and an animal renowned for its agility and intelligence (the humanist intellectual) could not better express the interaction between an admiration for the past aimed at searching for an eternal idea of humanity and the necessity to face the challenges posed by technological innovations.

Carlo Susa

(Accademia di Belle Arti di Brescia SantaGiulia)

Note

[1] For a definition of the concepts evoked here, see the concise yet detailed T. Castellani, T. Castellani, Scienza, tecnica, tecnologia: un intreccio indissolubile, in Insegnare, no. 1-2 (2011); available at the following internet address: https://www.researchgate.net/publication/260123263_Scienza_tecnica_tecnologia_un_intreccio_indissolubile.

[2] E. Grant, Le origini medievali della scienza moderna. Il contesto religioso, istituzionale e intellettuale, Einaudi, Torino, 2001.

[3] For a comprehensive view on these topics, see the dated but still valid: L. Mumford, Technics and Civilization, Routledge & Kegan Paul, London, 1955; Italian translation: Tecnica e cultura, Il Saggiatore, Milan, 1961.

[4] Oresme develops this concept in his last work, the vernacular translation of Aristotle's De Caelo, which he published in 1377. A modern edition of the work to refer to is: N. Oresme, Le Livre du ciel et du monde, The University of Wisconsin Press, Madison, 1950.

[5] The text is cited in: E. Garin, L'umanesimo italiano, Laterza, Bari-Roma, 1993, p. 32; the study to which reference is made for further exploration of these topics.

[6] On these topics, see in particular J. Sawday, Engines of the Imagination. Renaissance Culture and the Rise of the Machine, Routledge, New York, 2007, pp. 1-30.

[7] M. Ficino, Teologia platonica, edited by E. Vitale, Bompiani, Milan, 2011, pp. 1226-1227.

[8] For an excellent and up-to-date profile of Manuzio, refer to: G. Petrella, L'eredità di Aldo. Cultura, affari e collezionismo all'insegna dell'Ancora, in G. Montinaro (ed.), Aldo Manuzio e la nascita dell'editoria, Olschki, Florence, 2019, pp. 15-33.

[9] On the late medieval polemics against printing, see for example: Stampa meretrix. Scritti quattrocenteschi contro la stampa, edited by F. Pierno, with the collaboration of G. Vandone, Marsilio, Venice, 2012.

[10] On the origins of the typeface, see: G. Petrella, Santa Caterina, Aldo e le origini del corsivo. La misteriosa nascita di un carattere, in La Biblioteca di via Senato, VI (2014), no. 3 (March), pp. 21-28.

[11] The case of Lorenzo Valla and his demonstration of the falsity of the Constitutum Constantini is well-known in

humanistic circles. Much less known, however, to those outside the field, is the fact that the initiator of this type of investigation was none other than Petrarca, who proved that two ‘diplomas’ in the possession of Emperor Charles IV of Bohemia, attributed to Julius Caesar and Nero, were false. For more on this episode, see: U. Dotti, Vita di Petrarca, Laterza, Rome-Bari, 1987, p. 341. he advances of science and technology, the rise of unbridled individualism, and the hypertrophy of the economy and finance appear increasingly irreconcilable with the idea of humanity in which many of us still recognize ourselves, and which helped shape Western civilization. For this reason, it may at first seem surprising that there are relatively few studies—almost always focused on very specific topics rather than general issues—on the relationship between late medieval humanists and the technology of their time.

In fact, simply posed in these terms, the question might appear incongruous, or even the result of a historical misapprehension. For us, the concept of technology is closely tied to that of science. In some ways, technology can be defined as the systematic and reasoned resolution of technical problems, based on scientific theories and practices. If one accepts that technology can be described as “scientific technique,” it logically follows that without scientific thought, only technique can exist, not technology.[1] Therefore, if the birth of scientific thought i

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