

# Aufsätze

## Social and Textual Roots of Relativistic Thinking in the Fourteenth Century

### The Marketplace and Medieval Galenism

von Joel Kaye

By the second quarter of the fourteenth century, in the writings of leading scholastic natural philosophers, there is ample evidence of a strongly relativized world view, one sufficiently powerful to make possible a profound re-imagining of society, nature, and the cosmos. In this new way of seeing and imagining the world, social, perspectival, and physical systems, including the universe itself, were redefined as relational fields, with no fixed top and bottom, no single unifying axis, no absolute directions, and no privileged point of viewing. Considering that this view of the world had no place in earlier Latin Christian writings, and that it would come to occupy a central place in the later development of European thought – very much including scientific thought – its construction is one of the momentous achievements of late medieval intellectual culture.

While all evidence of this achievement comes to us through the keen speculations of individual scholars, I want to suggest that a vibrant intellectual culture – in this case the scholastic culture of the medieval university from the mid-thirteenth to the mid-fourteenth century – played an essential role in making possible a reconceptualization of this magnitude. But even given the existence of this highly trained, highly communicative, highly disputatious intellectual culture, the question remains: what other factors underlay the new capacity not only to see and think in fully relativized terms, but, quite literally, to play with the possibilities of relativity when projected onto the workings of the world?

I question whether the reception of the Aristotelian corpus into the Latin university, which helps to explain so much of scholastic culture, will suffice as an explanation here. No doubt, the relativistic elements that do appear in Aristotle's writings were recognized and grappled with from the early days of their reception.<sup>1</sup> At the same time, however, *a priori* assertions, conceptual absolutism, and hierarchical ordering on many levels play a determinative role in Aristotle's thought, particularly in the sphere of natural philosophy, and these tended to reinforce the anti-relativist attitudes long entrenched in Christian intellectual culture, rather than posing a challenge to them. Indeed, as will be apparent, some of the clearest and most profound instances of the

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1 For an example of relativized judgements in Aristotle's thought, see below for his brilliant analysis of the determinants of economic value and its further development in scholastic writings. For a fuller discussion on these points, see Joel Kaye, *Economy and Nature in the Fourteenth Century: Money, Market Exchange, and the Emergence of Scientific Thought* (Cambridge University Press, 1998), esp. 47–50, 68–70, 147–52.

new relativism appear in commentary responses that directly challenge Aristotelian assertions of absolute and unidirectional principles in nature.<sup>2</sup>

If the writings of Aristotle were unlikely to have provided a textual basis for what I call here “the new relativism,” I will argue in this paper that the writings of another ancient author, Galen of Pergamon (d. ca. 216 CE), very well could have, fortified as they were by learned commentaries in Greek, Arabic, and Latin. I have come to doubt, however, that textual influences alone are sufficient to explain the magnitude of change represented by the emergence of this powerful new mode of perceiving and thinking. I will propose instead that the “new relativism” emerged only when the urban environment and the urban marketplace had, by the later thirteenth century, developed to the point where it provided university scholars with daily *practical experience* in relational thought and perception – experience of sufficient strength to reinforce and amplify whatever textual education in relativity they may have received.

Meaningful arguments can be made in favor of other social contexts generative of relational thinking. The centrality of law to medieval culture, and the profound development of legal theory and practice from the twelfth century forward taught an entire intellectual culture steeped in religious and transcendent ideals to see the necessity and the benefits of thinking in conditional and relativist terms. As legal theory advanced, the recognition grew that judicial determinations required the weighing of a wide constellation of causes and contexts and must vary in relation to them, that justice itself was grounded in the capacity to see and think in relative terms.<sup>3</sup> But of all the socio-economic factors from outside the schools that contributed to relational thinking, I argue here that those most responsible for the emergence of the new relativism – the factors *sine qua non* – were the linked processes of monetization, market development, and urbanization that transformed European society between the twelfth and the fourteenth century.

One way to bring the elements of the new relativism into relief is to foreground speculation from a slightly earlier period in which it is either absent or appears in highly attenuated form. The prolific writings of Albertus Magnus (1206–1280), a philosopher and theologian of immense intellectual power and accomplishment, are instructive here. Albert was indefatigable in fulfilling his expressed intention to make the whole of the Aristotelian corpus comprehensible to his fellow Latin Christians. He was the first scholar to show that the writings of Aristotle could be fully and productively integrated into Christian philosophy and theology, a project that had immense and lasting consequences for Latin Christian thought. Although he was a scholar for the ages and a great natural philosopher for his time – justly renowned for the breadth of his knowledge and his powers of observation and analysis – his writings reveal that

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2 For an earlier discussion of these commentaries, focusing on their concerted application of relativistic seeing and thinking, see Kaye, *A History of Balance, 1250–1375: The Emergence of a New Model of Equilibrium and Its Impact on Thought* (Cambridge University Press, 2014), 442–62. This work received a French translation in 2017: *Histoire de l'équilibre, 1250–1375: L'apparition d'un nouveau modèle d'équilibre et son impact sur la pensée* (Paris, Les Belles Lettres.)

3 This is yet another area in which Aristotle recognized the crucial role of relativized determinations. On this, see *Nicomachean Ethics*, V, 10: 1137a30–1137b31. For the continuation of this insight in thirteenth-century thought, see for example, Thomas Aquinas, *Summa Theologica*, II–II, 120, art. 1.

relativistic determinations play a comparatively minor role in his vision of the world and its workings, especially when viewed in light of what was to follow. In Albert's imagination of the working principles of society, ethics, and nature, hierarchical order as determined by divine reason and divine plan is the rule, leaving limited room for the play of relativity. Indeed, at times he seems somewhat puzzled by its application

Of course, as an Aristotelian and a great observer of the natural world, Albert is aware that perceptions, judgments, and statements concerning objects, their behaviors, and their powers are often made "*ad aliquid*," which is to say conditionally and in relation to context. He is well aware of the power of contexts (including place itself) to shape the qualities of the things they contain, and he is aware that the same natural causes may well have different effects in different contexts. He also makes use of a limited concept of relation in his exploration of divine and natural order, insofar as all hierarchies involve the relationships of part to part along a graded scale with God at its summit. But in essence, relation, for Albert, is tied to a world organized around a single axis of being. God is the first cause of all natural causes, and all natural causes reflect the mind and plan of their creator.<sup>4</sup> All existence participates in a unified and unidirectional hierarchy in which every part of creation has its proper place according to divine plan and is ordered in its essential nature to the plan as a whole. There is no sense in Albert's writing that there is anything other than a single privileged point from which all *essential* natures and values derive and can be judged. As he writes:

*It is a general truth that all things are ordered to the single ultimate good according to the relation they have to it (secundum relationem quam habent) in terms of being nearer or more remote. The more remote things are from the ultimate good, always the more obediently they are ordered to those things that are nearer.*<sup>5</sup>

There is little sense in Albert's writings of relation as a potential solvent of hierarchical order and gradation; or of relation as inherently multi-directional and in opposition to the concept of a fixed plan covering all of being and ordered to an absolute top and bottom; or of relation as a dynamic principle capable of both organizing and explaining systematic activity in the absence of an all-encompassing divine Intelligence. To this last point, consider the following passage from Albert's *De mineralibus* (*On Minerals*), written c. 1250–54:

*One of our Order, a careful observer, has told me that he had seen a magnet belonging to the Emperor Frederick, which did not attract iron, but on the contrary, the iron attracted the stone.*<sup>6</sup>

4 E.g., Albertus Magnus, *De causis proprietatum elementorum*, ed. Paul Hossfeld, S. Alberti Magni, Operum omnium, Vol. V.2 (Aschendorff, 1980), 76; *On the Causes of the Properties of the Elements*, trans. Irven Resnick (Marquette University Press, 2010), 72.

5 Albertus Magnus, *Ethicorum libri decem*, ed. August Borgnet, *Alberti Magni Opera Omnia*, vol. 7 (Paris, 1891), I. 3. 11, 44b: "Regulariter enim verum est, quod quaecumque sunt ad unum bonum ultimum, secundum relationem quam habent illud bonum propinquius vel remotius ordinantur ad illud. Et ideo remotiores semper obediunt erunt his quae propinquius ordinantur."

6 Albertus Magnus, *Book of Minerals*, trans. Dorothy Wyckhoff (Oxford, 1967), 104. Wyckhoff notes (104, n. 6) that Albert's confusion here had precedents in Pseudo-Aristotelian and Late Roman

It is hard to read the vast writings of Albertus Magnus and of other authors from the mid-thirteenth century, including his student, Thomas Aquinas, without admiring how beautifully woven is their hierarchical world view, made ever more so by its intricately constructed ties to a theology that proclaimed a single beginning and a single end for all of creation. The web of interlaced definitions and meanings they constructed, reinforced by Aristotelian hierarchies and first principles, appears airtight and impregnable. And yet, by the final decades of the thirteenth century, one can see their vision of a world ordered by unidirectional hierarchy unraveling in area after area of scholastic speculation, replaced by a new sensitivity to the destabilizing logic of relation. In the decades that followed, this process continued in a broad range of subjects – medicine, law, political theory, visual perspective, music, terminist logic, economic thought, cosmology, natural philosophy, and more – until by the second and third quarters of the fourteenth century, relativistic thought achieved its fullest expression within medieval university culture.

In this newly relativized vision, shared by leading thinkers in this period, the universe came to be seen as a complex moving *system*, ordered through the ever-shifting relations of its moving parts, rather than in accord with a fixed and graded *plan* designed by an overarching Intelligence.<sup>7</sup> Thinkers who shared in this vision, moved toward a view of the universe in which there is no privileged point of perspective; no top, no bottom, no unifying axis; no absolute directions of up, down, left and right; and no particular meaning attached to place and position within the ever-shifting systematic whole. Yet it is important to stress that even as these thinkers functioned as agents of this massive reconceptualization, they held firmly to their passionate self-identification both as good Aristotelians and as good Christian believers in an omniscient and omnipotent God. None questioned the absolute powers of God as first cause on a theoretical or devotional level, even as it became possible for them to speculate on the workings of the world in relational terms without reference to God's causal power and plan. These newer attitudes are everywhere evident in the writings of two leading philosophers of the period, Jean Buridan (c. 1292–c. 1363) and Nicole Oresme (c. 1320–1382). Both thinkers spent their formative years at the University of Paris in the first half of the fourteenth century, and both have long been recognized as leading natural philosophers of their day.<sup>8</sup>

With Buridan and Oresme, we find thinkers who were not only actively applying relativity to their vision of nature, and speculating about its many implications, but they were capable of literally *playing* with relativity – playing with its possibilities when projected onto the workings of society, nature, and the cosmos. Beginning in the 1350's, Oresme took relativity and its implications for physical thought, including its potentialities as an instrument of criticism and de-stabilization, as far as any medieval thinker. As evidence for this statement, I offer here a distilled presentation of two of his remarkable speculations.

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writings on the powers of the magnet. For the Latin text, *De mineralibus et lapidis*, ed. A. Borgnet, *Opera Omnia*, vol. 5 (1895), 1–116, at 49. For the dating of the *De mineralibus* between 1250 and 1254, see James Weisheipl, "Appendix I" in *Albertus Magnus and the Sciences: Commemorative Essays 1980* (PIMS, 1980), 565–577, at 568.

<sup>7</sup> For the cluster of conceptual elements that composed this new vision, see *A History of Balance*, 5–11.

<sup>8</sup> William Courtenay, "The University of Paris at the Time of Jean Buridan and Nicole Oresme," *Vivarium* 42 (2004), 3–17; Courtenay, "The Early Career of Nicole Oresme," *Isis* 92 (2000), 542–48.

The first concerns his argument for the possible existence of multiple universes.<sup>9</sup> Two points are worth stressing from the beginning: 1) Oresme himself recognized that his new views on this question rested on his application of a thoroughgoing relativity to the problems it raised; and 2), he was fully aware, at the same time, that his speculation on this question directly challenged not only Aristotle's well-developed position on the matter but established Christian views as well. Where Aristotle presented what were, in his mind, incontrovertible arguments against the possibility of multiple worlds, Oresme writes that he, nevertheless, is able to "imagine" this possibility, and he proceeds to work out a hypothetical case to illustrate it. He imagines that within an apple-sized space at the center of our own earth, another entire world similar (*semblable*) to our own could exist without violating any basic physical [i. e. Aristotelian] principles. This second "world" could, for example, be complete with an earth inhabited by humans, and it could also be surrounded (just like ours) by a moon, sun, planets, and stars. To the objection that this second world would have to be far too small to be a real world, or that "the size of a man could diminish or grow so much that he would no longer be a man, and the same with all bodies," Oresme replies:

*I point out that large and small are relative terms (nons relatifs) used in comparisons and not absolute terms. For each body, however small, is large with respect to the thousandth part of itself.*<sup>10</sup>

Once he has established this principle, he is then in the position to go further to suggest that a small apple-sized space at the center of this second shrunken earth *could be imagined* to contain within it yet another universe, with its full complement of planets and stars circling an earth inhabited by humans, and, presumably, on and on. Then, expanding yet further the principle of relativity when applied to size and perception, he writes:

*By this it follows that were the world to be made between now and tomorrow, 100 or 1000 times larger or smaller than it is at present, with all its parts enlarged or diminished proportionally, everything would appear tomorrow exactly as it appears now, just as though nothing had been changed.*<sup>11</sup>

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9 Nicole Oresme, *Le Livre du ciel et du Monde*, ed. Albert D. Menut and Alexander Denomy, trans. A. D. Menut (University of Wisconsin Press: Madison, 1968), Quest. I.24, 166–79. See also *Economy and Nature in the Fourteenth Century*, 231–46, under the heading "Relation and the Relativity of Value in Exchange." Other examples of relativized speculations in natural philosophy, by thinkers other than Buridan and Oresme, are also considered under this heading, including speculations associated with the Oxford "Calculators."

10 Nicole Oresme, *Le Livre du ciel et du Monde*, I.24, 168–69: "je suppose premierement que tout corps est divisible en partie<s> touzjours divisibles sanz fin ... Item, que *grant et petit* sont nons relatifs di<s> en comparoyson et non pas absolument, quar chascune chose, tant soit petite, est grande ou regart de la.m. partie de elle ..."

11 Oresme, *Le livre du ciel*, I.24, 168–69: "Item, par ce s'ensuit que se le monde estoit fait entre cy et demain plus grant ou plus petit.C. foyes ou.M. foyes que il n'est maintenant, et toutes ses parties estoient creues ou apeticiees proporcionnelment, toutes choses apparostroient demain tout aussi comme maintenant aussi comme se rien ne fust mué. For a condensed statement of this argument in the writings of Jean Buridan, see his *Questiones super octo phisicorum libros Aristotelis* (Paris, 1509),

The point here is not that Oresme actually believed that multiple worlds existed, nested one within the other: he did not. The point is that he was sufficiently at home with relativity, and sufficiently aware of its destabilizing potential, to be able to literally *play* with its possibilities when projected onto the world; a play that he actually announces at the question's beginning, when he writes: "Another speculation can be offered which I should like to toy with as a mental exercise."<sup>12</sup>

An equal or perhaps even more dramatic example of such play is found in Oresme's well-known speculation on the possible daily rotation of the earth. Here he employs relativity to turn the world upside down. His speculations on this subject appear in his commentary to Aristotle's *a priori* arguments that the earth is, must be, and must eternally remain at perfect rest at the absolute center of our circular universe.<sup>13</sup> Oresme demurs. His many counter arguments both challenge this set of assertions and provide the basis for immensely fertile counter possibilities. One of these involves his forceful argument for the possible daily rotation of the earth to better explain the merely "apparent" daily motion of the heavens around the earth. Here relativity plays with exuberance over the field of motion and perspective.

At the basis of his arguments in favor of a rotating earth (arguments that build upon those made years earlier by Jean Buridan and that precede those made by Copernicus by almost two centuries) lies the principle of relative motion, which Oresme presents as indubitable.<sup>14</sup> He expresses it thus:

*Now I take as certain that local motion can be perceived only if we can see that one body assumes a different position relative to [ou resgart de] another body.*<sup>15</sup>

This principle is then followed by his well-known example (following Buridan) of two ships, one moving and one stationary, and the problem of perceiving the source of motion between them. He then projects the uncertainty introduced by the principle of relative motion onto the problem of deciding whether the apparent motion of the heavens can best be explained by a rotating earth or by the daily rotation of the heavens around a fixed earth, as Aristotle had maintained through a series of *a priori* assertions.<sup>16</sup>

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reprint (Minerva: Frankfurt a. M., 1964), Bk 3, Q. 15, 57vb. For speculation on the specific social and economic forces at play in the society of Oresme that might have encouraged this profound insight into the implications of relativity, see *Economy and Nature in the Fourteenth Century*, 238–39.

12 Oresme, *Le livre du ciel*, I.24, 166–67: "Une autre ymaginacion puet estre laquelle je veul traiter par esbatement et pour exercitacion de engin ..."

13 Oresme, *Le Livre du ciel*, ed. Menut and Denomy, Question II.25, 518–39.

14 For Buridan's earlier speculation on the earth's possible daily rotation, also based squarely on the principle of relative motion, see *Joannis Buridani Expositio et Quaestiones in Aristotelis De caelo*, ed. Benoît Patar (Louvain: Éditions Peeters, 1996), II, 22, 505–07. For more on this speculation, see, *A History of Balance*, 456–60. For a partial English translation of this question, see Marshall Clagett, *The Science of Mechanics in the Middle Ages* (Madison, University of Wisconsin Press, 1959), 594–99.

15 Oresme, *Le Livre du ciel*, Question II.25, 518–39 at 522–23: "Item, je suppose que mouvement locale ne> peut estre sensiblement appareu fors en tant comme l'en apparçoit un corps soy avoir autrement ou resgart d'autre corps." For Buridan's earlier and equally clear recognition of the principle of relative motion, *Questiones super octo phisicorum*, Book 3, Q. 7, 51ra.

16 Almost two centuries later, Nicolaus Copernicus (*De revolutionibus orbium coelestium*, I.8), uses the very same example of two ships moving relative to each other to explicate the principle of relative motion at the core of his new model of the cosmos.

In the course of working out the implications of relative motion, Oresme comes to the point where he is able to imaginatively project his eye (or, rather, a disembodied human eye) into the heavens, and then to imagine further what that eye would see when looking back to earth. In his words:

*To an eye in the heavens which could see the earth clearly, it [the earth] would appear to move [rotate]; if the eye were on the earth, the heavens would appear to move [rotate]. Nor would the vision of this eye be deceived, for it can sense or see nothing but the process of the movement itself.<sup>17</sup>*

After establishing the reality of relativized perspective, and exploring some of its enlightening and disturbing implications, Oresme continues by countering traditional arguments that have been made against the earth's rotation with a number of strong arguments in its favor. Indeed, the many arguments that he presents in favor of the earth's diurnal motion appear at least as probable, if not *more* probable, than traditional arguments on behalf of its eternal fixity at the center of the universe. If this were not destabilizing enough, he avows, at the conclusion of his arguments, that in the realm of natural knowledge there is simply no incontrovertible evidence to support either position. He has come to see that the perspective taken by the heavenly eye possesses perfectly equal weight to that of the earthly eye. He has come to recognize the existence of two valid axes, two valid points of judgment, with (as he specifically concludes) no rational way of choosing between them.<sup>18</sup> At the core of this recognition lay his capacity to imagine the entire cosmos as a system in relation.<sup>19</sup>

There are many more speculations in the writings of Oresme, Buridan and other leading scholastic thinkers of this period that derive from a similar relational perspective and a similar desire to explore its implications.<sup>20</sup> Taken together, these speculations provide clear evidence that by the mid-fourteenth century, a richly developed relativized world-view had become established within university culture. It was a worldview sophisticated enough and powerful enough to move the earth itself, and this in the face of the immense authority of Aristotle, Holy Scripture, and the long Christian intellectual tradition.

I stated earlier that this momentous intellectual development was made possible by a confluence of socio-economic and intellectual factors, and in the socio-economic arena I singled out the processes of monetization, market development, and urbanization as

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17 Oresme, *Le Livre du ciel*, II.25, 536–37: “se un ouyl estoit ou ciel et il voi<s>t clerement la terre, elle sembleroit meue, et se le ouyl estoit en terre, le ciel sembleroit meu. Et le voient n'est pas pour ce deceu, car il ne sent ou voit fors que movement est.” The phenomenon of the projected eye is discussed further in *A History of Balance*, 455–62.

18 He concludes by arguing that the question of the earth's rotation simply cannot be decided by human observation and reason alone, and in the absence of certainty on the subject, which he recognizes is a feature of relativistic speculation, he chooses to accept the traditional and religiously sanctioned view of a fixed earth.

19 Clagett, *Science of Mechanics*, 587: “Buridan hinted at, and Oresme rather specifically outlined, the concept of a closed mechanical system, wherein, due to the relativity of the perception of motion, the observer describes all movements as if they were part of his system only.”

20 For detailed textual evidence on this point, see *A History of Balance*, 411–62.



those I believe were most responsible for its occurrence. At this point I would like to suggest how this might have worked – how these profound social and economic developments taking place in the society beyond the schools may have directly impacted the evolution of relativistic thinking within the highly refined and seemingly detached intellectual culture of the medieval university.

The move toward a relativized world view is at the same time a move away from a single privileged point of viewing and judging. I propose here that conceptual motion in this direction requires the emergence of a second scale of value, differing in marked and inescapable ways from the first, yet of fairly equivalent weight. The existence of two (or more) such scales, in turn, creates the need to develop first the ability, and, with time, the facility to imagine how things might be regarded and valued when viewed against these differing scales. I suggest here that the economic order of the thirteenth and fourteenth century, both in its action and in the way it was perceived at the time, provided that second scale of requisite weight and difference. Indeed, in text after text, not only in this period but beginning more than two centuries prior to it, the value scale of the economic order was presented as both immense in its power and influence and, at the same time, as opposed in its very nature to the ontological scale of the Christian order.<sup>21</sup>

Christian ontology centers on a single vertical axis, conceived as a graded scale or ladder of perfection, extending from God down to the least of His creation. Each element of creation occupies a fixed place in the order, ordained from all eternity by the creator God. We have already seen evidence of this belief in the words of Albertus Magnus, but he was only one in a long and unbroken line of Christian thinkers. In contrast, economic order is, in essence, relativized order. Things higher in value today may be lower tomorrow; the position held by any good on money's numbered scale of value can shift from day to day, week to week, and season to season, relative to time, place, and circumstance.

The sense that the relativized scale of economic value opposed, and even more, had come to swamp the scale of Christian value was a constant refrain in later medieval Christian culture. It is not only I or other modern historians who maintain this. Warnings of the threat posed to Christian values by a social logic in which "money has become the measure of all things," was one of the great shared themes of the period, stretching back at least to the explosion of venality satire in the second half of the eleventh century.<sup>22</sup> It was voiced everywhere from that time on, from low satire, to countless sermons, to the most profound literature of the day, and ultimately, in its most refined and intellectualized form, within scholastic philosophy and theology.<sup>23</sup> Taken as a whole, these writings indicate to me that it was here, above all, in the growth of a system of economic valuation grounded in relativity, and one, moreover, sufficiently pervasive

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21 The long and continuous tradition of this attitude is forcefully presented in John Yunck, *The Lineage of Lady Meed: The Development of Medieval Venality Satire* (University of Notre Dame Press, 1963); Lester Little, *Religious Poverty and the Profit Economy in Medieval Europe* (Ithaca: Cornell University Press, 1978).

22 Yunck, *Lineage of Lady Meed*.

23 For more on this subject, see Joel Kaye, "Monetary and Market Consciousness in Thirteenth and Fourteenth Century Europe," in *Ancient and Medieval Economic Ideas and Concepts of Social Justice* (Leiden: Brill, 1998), 371–403.



and powerful to offer a challenge to the dominant system of religious valuation and ontological grading, that relative thinking was nurtured, strengthened, and refined.

The persistence of the usury prohibition over the medieval centuries has fostered a still commonly-held belief that intellectuals of the period were little interested in or knowledgeable about the economic life of their society. The truth is very different and far more interesting. The prohibition of usury had the effect of forcing Christian legal scholars, moralists, and theologians to look closely into the workings of the marketplace. Only in this way could they hope to judge which of the ever-multiplying forms of exchange were usurious and must be condemned. Those who undertook this task were brought to recognize that economic life functions according to its own rules and its own principles – even when those principles were distinct from, *and even at odds with*, often-stated principles governing the Christian life. By the mid-thirteenth century, scholars had come, for example, to recognize that economic truths are at best provisional rather than absolute; that virtually all economic judgments require calculating with estimated probabilities rather than with certain knowledge; and, above all, that economic value is ever-shifting and fully relativized rather than fixed and ordered to any recognizable hierarchy or ontology.<sup>24</sup>

Then, with the first complete Latin translation of the *Nicomachean Ethics* at mid-century, university scholars had Aristotle's brilliant analysis of money and economic exchange in Book V to clarify and reinforce the lessons of economic relativity learned via observation and experience.<sup>25</sup> Following the Latin translation of the *Ethics*, it became standard for scholastics to assert, with Aristotle, that economic value varied "naturally," not only relative to the supply of goods, which, in turn, varied with respect to changing times and places, but relative as well to human need (*indigentia humana*), which was itself understood to shift with respect to time, place, and circumstance.<sup>26</sup>

The marketplace was thus dominated by two orders of relativity, working in tandem, with their effects multiplied by their juxtaposition. As the comprehension of market relativity deepened, so too did the inescapable recognition that there is no link between economic value and meaning; none between the value of a good and its inherent nature in any hierarchical scheme; none between the place a good or service occupies on money's numbered scale and its proper place on the Christian ontological scale.<sup>27</sup> To

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24 On this subject, see *A History of Balance*, 20–75. For the early role of clerical institutions in actually driving the process of monetization and market development in their societies, see *Money and the Church in Medieval Europe, 1000–1200: Practice, Morality and Thought*, ed. Giles Gasper and Svein Gullbekk (Ashgate, 2015).

25 Robert Grosseteste's first full translation of the *Ethics* appeared in 1246–47, and a revised and more highly utilized version appeared by 1260. For a discussion of Aristotle's insights into the relativity of value in exchange in *Ethics* V, as well as the reflection of these insights in scholastic writings of the later thirteenth and fourteenth century, see *Economy and Nature in the Fourteenth Century*, 37–50, 136–52.

26 Thomas Aquinas, *Sancti Thomae de Aquino sententia libri ethicorum*, Opera Omnia vol. 47 (Rome: Commissio Leonina, 1969), 295a: "sed rebus pretia imponuntur secundum quod homines indigent eis ad suum usum." For secondary works that brought this reality to light along with the

27 For a sample of important secondary works on the emergence of these and other scholastic economic insights, albeit absent a focus on the question of relativity per se, see John Baldwin, *The Medieval Theories of the Just Price. Romanists, Canonists, and Theologians in the Twelfth and Thir-*

take a much cited example, first found all the way back in the writings of St. Augustine and then repeated again and again following the scholastic reception of the *Ethics*: in the marketplace a piece of bread is valued higher than a mouse, even though on the Christian scale of being, the mouse, which is endowed with the spirit of life, occupies a much higher place than the lifeless bread.<sup>28</sup>

The *Ethics* of Aristotle, with its extraordinarily perceptive treatment of money and economic exchange in Book V, received numerous scholastic commentaries, beginning with those of Albertus Magnus and Thomas Aquinas, written soon after its first full Latin translation, and continuing for centuries following. Of these, one of the most insightful and thorough in the matter of economic exchange was authored by Jean Buridan, the eminent philosopher and Master of Arts at the University of Paris, who labored on it over the course of the 1340's.<sup>29</sup> In good scholastic fashion, Buridan moved easily between his comments on Aristotle's works on natural philosophy (noted above) and those on the form and logic of exchange in Book V of Aristotle's *Ethics*, thus facilitating the transference of insights and modes of thought between them.

As was common in the commentary tradition, Buridan broke down his response to Aristotle's text into questions. Among these were questions centered on the determinants of economic value, on the requirement for just equalization in exchange, on the dynamic process of exchange, and on the necessary role of money as a common, numbered measure to facilitate relation and exchange. Each of Buridan's questions are many times longer and more detailed than Aristotle's parallel discussions in Book V, and taken together, they expose each of Aristotle's economic insights to rigorous analysis and elaboration. As I hope to show, at the core of each question lies Buridan's

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teenth Centuries, in *Transactions of the American Philosophical Society* 49 ( Philadelphia, 1959); Jean Ibanès, *La Doctrine de l'Église et les réalités économiques au XIIIe siècle* (Paris: Presses Universitaires de France, 1967); Amleto Spicciati, *La mercatura e la formazione del prezzo nella riflessione teologica medioevale* (Rome: Accademia dei Lincei, 1977); Giacomo Todeschini, "Oeconomica francescana. I: Proposte di una nuova lettura delle fonti dell'etica economica medioevale; 2: Pietro di Giovanni Olivi come fonte per la storia dell'etica-economica medioevale," *Rivista di storia e letteratura religiosa* 12 (1976), 15–77, and 13 (1977), 461–94; *ibid.*, (ed.), *Un trattato di economia politica francescano: il "De emptionibus et venditionibus, de usuris, de restitutionibus"* di Pietro di Giovanni Olivi (Rome, 1980); *ibid.*, *Franciscan Wealth: From Voluntary Poverty to Market Society*, trans. Donatella Melucci (Saint Bonaventure, N. Y.: The Franciscan Institute, 2009); Odd Langholm, *Economics in the Medieval Schools: Wealth, Exchange, Value, Money, and Usury According to the Paris Theological Tradition* ( Leiden: E. J. Brill, 1992); Giovanni Ceccarelli and Sylvain Piron, "Gerald Odonis' Economics Treatise," *Vivarium* 47 (2009), 164–204; Sylvain Piron, ed., notes, and French translation, *Pierre de Jean Olivi, Traité des Contrats* (Paris, Les Belles Lettres, 2012).

28 E.g., Aquinas, *Sententia libri ethicorum*, 294b–95a: "non enim appreciantur res secundum dignitatem naturae ipsorum; alioquin unus mus, quod est animal sensibile maioris pretii esset quam una margarita, quae est res inanimata . . ."

29 Jean Buridan, *Quaestiones in decem libros ethicorum Aristotelis ad Nicomachum* (Paris, 1489, 1513; Oxford, 1637). The 1637 edition closely follows that of 1513, and I cite it below. Since the 1513 edition is available in an excellent reprint (Minerva, Frankfurt am Main, 1968), I also cite relevant page numbers from it in brackets. For more on Buridan's commentary, see James J. Walsh, "Nominalism and Ethics: Some Remarks about Buridan's Commentary," *Journal of the History of Philosophy* 4 (1996), 1–13, esp. 4. Odd Langholm translates a portion of one of Buridan's economic questions into English in "Buridan on Value and Economic Measurement," *History of Political Economy* 38 (2006), 269–89, at 279–81. For an earlier discussion of Buridan's analysis of exchange under the umbrella of relation and relativity, see my *Economy and Nature in the Fourteenth Century*, 142–52.

keen grasp of the role played by relation and relational thinking, which he extends to virtually every aspect of economic exchange.

Buridan's analysis begins with what he and everyone around him could easily see. Prices vary continually: apples in summer cost five times more than apples during fall harvest, 30 wine is cheaper where it is produced than where it is carried,<sup>31</sup> sometimes the same measure of wheat is priced at the equivalent of 10 pairs of shoes and sometimes only 3;<sup>32</sup> the price of bread in the marketplace of Bruges (*in foro Brugis*) differs from that in Paris (*in foro Parisiis*).<sup>33</sup> This leads Buridan to one of his primary economic principles, which he declares many times and in many forms: the economic value of goods in exchange is *not* determined by their inherent natures (*non secundum naturam rei*); *nor* by any inherent value they might possess; *nor* by their position on a scale of perfection ordered by the plan of God. In support of this position, he elaborates on the older insight that if economic value were congruent with ontological hierarchy, then a fly or any living being would cost more than the most precious gem.<sup>34</sup>

If it is clear, then, that price is a relative determination, the question is, relative to what? Aristotle had answered this question brilliantly, and Buridan basically follows him here. Price is always and only relative to the element of human need that attaches to goods and services in exchange (*ad nos et indigentiam humanam*).<sup>35</sup> Indeed, he criticizes the idea that price can represent anything fixed or knowable whatsoever – can be anything but an approximative and relativist estimation made on the basis of variable need.

Remaining unquestioned throughout his entire discussion on this subject is the principle, enunciated by Aristotle and fully supported within Christian culture, that the just, proper, and required end of all economic exchange is the establishment of an equality between exchangers. Buridan adds to this his belief that equalization is not only the ideal end of every exchange, it is the end that is actually achieved in the marketplace when price is agreed to voluntarily, reasoning that all parties base their decisions to exchange at a given price on their estimation that they will derive benefit from it.<sup>36</sup> He does, however question how this equality is actually determined.

30 Buridan, *Ethics*, IV,6 [1513, 76ra], 1637, 308.

31 Buridan, *Ethics*, V,16 [1513, 106ra], 1637, 430.

32 Buridan, *Ethics*, V,13 [1513, 103va], 1637, 420.

33 Buridan, *Ethics*, II,16 [1513, 34vb], 1637, 143.

34 Buridan, *Ethics*, V,15 [1513, 105rb], 1637, 427: "equi et asini, et lapides, ferrum, boves, et caprae sunt commutabiles, et tamen constat quod secundum substantiae perfectionem et nobilitatem, equus, immo et quodcunque animatum, ut musca, excederet semper lapidem, aut inanimata quantumcunque multiplicata."

35 Buridan, *Ethics* V,13 [1513, 103vb], 1637, 420: "aut etiam rerum adinvicem commutandarum estimare valorum haec autem estimatio non attenditur secundum rerum naturam sed ad nos et indigentiam humanam. Also, *Ethics* V,16, [1513, 106ra], 1637, 430: "Item, in commutativa non estimatur precium commutabilium secundum naturalem valorem ipsorum sic enim musca plus valeret quam totum aurum mundi. Sed estimamus valorem ipsorum secundum quod veniunt in usum nostrum et non veniunt in usum nostrum nisi ad nostras supplendas indigentias."

36 Buridan, *Ethics*, V,10 [1513, 101ra], 1637, 409: "Hic ergo observatis, lucrum vel damnum si accidant, non sunt contra justitiam, immo sic in commutationibus est vera mercatura, secundum quam communiter utraque pars accipit quod magis est utile sibi." He adds three exceptions: exchanges involving manifest fraud, usurious contracts, and agreements undertaken by those incapable of reasoning in their own interests due to youth or defect.

Once again, he argues that it cannot be determined by comparison between the natures of the two goods exchanged, or between fixed quantities of the two goods, since the economic value of goods is never inherent or fixed. For this reason, it must be the variable quality of need itself, quantified by the numbered scale of money, that serves as the necessary third term in the commensuration and equation of goods.<sup>37</sup> He takes this argument yet further when he considers the necessary function of money as the prime instrument of measurement in exchange. Once again, proportionality and relativity not only enter the picture, they define it. Since the value of all things in exchange is determined by the amount of human need attached to them at particular times and places, the numbered scale of money can measure only the variable relation of the goods to human need; it does not and cannot measure the goods in themselves.<sup>38</sup>

Buridan is well aware of the understanding that developed within Roman and Canon law over the course of the thirteenth century, which held that in market exchange, the human need that equates to economic value and sets the price of things is not the need of this or that particular individual but is, rather, “common need” (*indigentia communis*) as it is experienced and determined by the whole community of exchangers. This insight had the effect of expanding the scope of relational ordering far past the personal and the individual case. But Buridan also recognizes an area of exchange in which prices are legitimately determined by personal estimations based on strictly personal needs. In explaining how this might work, he extends the equation of need and value beyond material goods to imagine how it might look when applied to immaterial services, favors, and even mere words.

In exploring this area, he offers a fascinating and extreme example of value relativity, one that is so extreme he assumes his readers will question it at first sight. He proposes the following case: someone gives you (his readers) ten pounds (a very considerable sum), and in return you simply say the words “thank you, lord” (*grates domine*). If his readers say that “this is impossible,” that there can be no equality in this case and hence no justice in this exchange, Buridan proceeds to demonstrate how equalization, and consequently justice, may, indeed, be served by it. At the core of his contention lies the rule he has already established many times over: all economic value is relative value, estimated relative to human use and need. Consider then, he continues, that the giver of the ten pounds is very rich and has little need of money but great need of honor, while the receiver of the ten pounds is a very good and honorable man, whose words are received by the rich man as a valuable acknowledgment. In such a case, Buridan concludes, the return of a simple “grates domine” for the price of ten pounds represents a sufficiently equal exchange to render it a just exchange.<sup>39</sup> The imaginary

37 Buridan, *Ethics* V,16 [1513, 106rb], 1637, 431: “Dico igitur, quod indigentia humana mensurat commutabilia secundum similitudinem proportionis non secundum equationem quantitatis. Nam secundum quod plus vel minus indigemus, secundum hoc res est pluris vel minoris valoris.”

38 Buridan, *Ethics* V, 17 [1513, 106vb], 1637, 433: “cum igitur, valor pecuniae mensuratus fuerit secundum proportionem ad humanam indigentiam, omnia commutabilia poterunt appreciari secundum proportionem ad pecuniam; qualem enim proportionem habebunt ad humanam indigentiam, talem proportionem habebunt ad pecuniam humanae indigentiae proportionatam.”

39 Buridan, *Ethics*, V,14 [1513, 104vb], 1637, 425: “Et si dicas, quod hoc est impossibile, quoniam si aliquis dat tibi decem libras, et tunc dicas ei grates domine tunc non valet tantum dictum tuum quantum decem librae. Ad hoc respondeo, quod valor rerum aestimatur secundum humanam indigentiam,

case that Buridan presents here represents the very furthest illustration of the relativity of value in exchange that I have found in the scholastic literature.

Here we see a thinker literally playing with the possibilities of relativity when projected onto the workings of economic exchange, just as he played with them in his speculations on nature and the cosmos. It was, after all, Buridan's arguments on the possible daily rotation of the earth that in many details anticipated Oresme's. It was Buridan who first recognized that the principle of relative motion, on which the possibility of a rotating earth rested, was itself incontrovertible.<sup>40</sup>

The difference between the perception of relativity in the area of the earth's diurnal rotation and its perception at the root of market exchange is that our experience tells us that the earth really *is* fixed in place. We have to learn to be able to conceive of it in constant motion and turning daily. On the other hand, economic exchange, especially when framed for scholastics by Aristotle's authoritative analysis in the *Ethics*, was recognized as (and thus *was open to being experienced as*) a dynamic and ever-shifting relational system, capable of continually re-arranging the elements of common supply and common need while, rather remarkably, continually maintaining itself in order. It was, moreover, a relational system that by Buridan's day had grown to occupy a central place in the lives and fortunes of every institution and every element of medieval society, very much including the students and masters at university like Oresme and Buridan, who were continually tasked with administrative responsibilities that required their involvement in and knowledge of the ways of the marketplace.<sup>41</sup>

Having considered the possible socio-economic roots of relativistic speculation within university culture, I turn now to explore the possible *textual* roots of this new way of seeing and thinking. Given the immense role played by the writings of Aristotle in the formation of scholastic intellectual culture, his works would seem to be the likely place to look for the textual roots of the new relativism. Indeed, they were the first place I looked for intuitions, examples, or signs that might encourage the full-blown relativity we can see in the writings of Buridan, Oresme, and other scholars of the fourteenth century. But I did not find in Aristotle what I was searching for. Indeed, as is apparent in the examples I presented above, those speculations in which the new relativism figures most forcefully were often consciously framed by scholastics *in*

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possibile est igitur, quod dans decem libras est valde dives, ita quod nihil vel modicum indiget pecunia, sed magis indigeret honore, et forte recipiens est magnae bonitatis et honestatis, ita quod dans decem libras multum honoratur, si ille recipiens dicat, grates domine: immo quandoque si solum dignetur recipere donum, illud, propter quod sic optime fit adaequatio secundum proportionem ad mensuram valoris."

40 Buridan, *Questiones super octo phisicorum*, 3:7, 51ra: "Sed tunc non possemus illum percipere non ergo vocatur localis quia ad ipsum sit locus necessarius sed quia percipi non posset nisi appareret mutatio loci vel situs rei ad aliam."

41 For evidence on this crucial point, see *Economy and Nature in the Fourteenth Century*, 28–36. Buridan himself was elected Rector of the University twice (the highest administrative office at the University of Paris), in 1328 and again in 1340, and he was supported in his teaching career by revenues from numerous Church benefices. Oresme served for years as grand master of the College of Navarre, the largest college at the university, with direct responsibility over the college's incomes and expenses.

*opposition* to previously established and defended Aristotelian positions, such as the eternal fixity of the earth, or the impossibility of multiple worlds.

If, then, the writings of Aristotle seem an unlikely textual influence on the emergence of the new relativism, I would like to propose that the medical writings of another ancient author, Galen of Pergamon (c. 129-c. 216 CE), could very well have served that function. Here I can only begin to suggest the speculative riches found in the Galenic corpus with respect to the understanding and treatment of relativity.<sup>43</sup> Although by the early fourteenth century more than a dozen of Galen's major works had been translated and were circulating in university circles, I focus here on a single work, *The Art of Medicine*, whose original Greek title, *Techne iatrike*, was variously translated into Latin as *Ars medica*, *Ars parva*, or simply *Tegni*, which is the name I will use in referring to it here.<sup>44</sup> It was the most widely read of Galen's texts throughout the medieval period, and it maintained a commanding position in the medical curriculum of European universities, including the University of Paris.<sup>45</sup>

The *Tegni* was one of Galen's later works (c. 193 CE), written explicitly to serve as his introduction to the art and science of medicine.<sup>46</sup> Although Galen could be extremely prolix, he crafted the *Tegni* as a concise work, the better to serve as a general introduction, and the better, he writes, to facilitate its memorization and internalization.<sup>47</sup> Within this text, Galen employs multiple layers of relativized determinations, and he does so with a scope and sophistication that was extraordinarily advanced in the context of the Latin Christian intellectual culture that received it between the twelfth and the fourteenth centuries.

Near the opening of the *Tegni*, Galen devotes a short paragraph to defining both the healthy body (*sanum corpus*) and the sick body (*egrum corpus*), doing so essentially in terms of the body's possession or lack of what we would call "balance," but which in the parlance of the time was designated as "equality" (*aequalitas* in the Latin). There are two parts to his definition, both tied to a complex view of the potentialities

42 Many of the major dates in Galen's life are still open to debate, including his years of birth and death. On this, see Vivian Nutton, "The chronology of Galen's early career," *The Classical Quarterly* 23 (1973), 158–71.

43 For considerably more on the subject of Galenic relativism, with extensive bibliography, see *A History of Balance*, 128–82.

44 On the circulation of new Galenic treatises from the late thirteenth century, see Luis Garcia Ballester, "The New Galen: A Challenge to Latin Galenism in Thirteenth-Century Montpellier," in *Galen and Galenism*, ed. John Arrizabalaga et al. (Aldershot: Ashgate Variorum, 2002), 55–83.

45 R. J. Hankinson has called the *Tegni* "the fundamental medical text of the Late Middle Ages and Renaissance." See, "The Man and his Work," in *The Cambridge Companion to Galen*, ed. R. J. Hankinson (Cambridge University Press, 2008), 1–33, at 22.

46 The *Tegni* circulated in two Latin versions, both dating from the twelfth century, one translated from a Greek original (*translatio antiqua*), and one translated ca. 1187 from the Arabic by Gerard of Cremona (*translatio arabica*). In citing from the *Tegni*, references to the *translatio antiqua* are to its first printed edition, *Opera Omnia Galeni* (Philippus Pincius: Venice, 1490), ed. Diomèdes Bonardus, 10ra–15vb. Citations to the *translatio arabica* are from *Hali Filii Rodbon in Parvam Galeni Artem Commentatio*, in *Plusquam commentum in Parvam Galieni Artem* (Venice, ad Iuntas, 1557), fol. 175r–217r. On the relation between the two versions, see *A History of Balance*, 137–40.

47 In its most recent English translation it occupies approximately fifty pages, "The Art of Medicine," trans. Peter Singer, in *Galen: Selected Works* (Oxford University Press, 1997), 345–96. For the translated portions of the *Tegni* that follow, I cite the page number in the Singer translation.



of systematic relation when attached to the workings of the animal body. A body, he writes, is generally healthy, when from birth it enjoys a well-blended (balanced) complexion in each of its primary parts (e. g. its blood, bone, muscle, cartilage, etc.) and in each of its organs (e. g. its heart, liver, brain, etc.). The complexion, for Galen, was the proportionally balanced blend of the four basic elements (earth, air, water, fire) and the four primary qualities (hot, cold, wet, dry), which constituted every individual human body as well as every one of the body's individual parts. In Galen's scheme, the particular proportional blend that is proper to each complexion is *essentially relativized*, determined differently with respect to the particular constitution of each individual body and the proper function of each of the body's myriad parts. Equally relativized is his view that a body can only be said to be healthy when the totality of its various organs and parts, governed by their differing complexions, exist, move, and interact in a balanced relation, both to each other and to the bodily whole.

Then, to what is already a highly complicated and many-layered understanding of the body as an integrated relational system, he adds yet further levels of complication by qualifying what the reader should understand by the very term "equal (i. e. balanced) complexion" when applied to real human bodies. Real bodies, he maintains, are never purely healthy (*simpliciter/absolute*); they are, at best, "healthy now" (*ut nunc*). This is true as well of every bodily part. The body (or bodily part) that is "healthy now" does indeed possess balance in its overall complexion, and co-equality does indeed describe the relationship between its constituent parts, but he adds this crucial qualification: "neither balance nor equality are to be conceived in terms of some abstract optimum, but rather in terms of what is proper (or optimum) relative to each particular body."<sup>48</sup> In Galen's system, neither balance (*aequalitas*) nor health itself can be treated by the physician as absolute, uniform, or universally applicable goals or states. Optimum balance does indeed equal optimum health, *but only relative to the optimum that can be achieved within each particular body or body part*. And as each body is different from every other, so the optimum balance for each body is also always different.

For Galen, medicine was both science and art. While the physician as scientist must rely on philosophy for the knowledge of universal first principles underlying the physical world, as artist-practitioner he must at the same time continually bring the abstractions of theory into line with the transience and particularities of individual human bodies.<sup>49</sup> As Galen often reminds his medical readers, "The cure comes first."<sup>50</sup> The ability to "read" and correctly interpret the shifting signs of the ever-shifting body lies at the foundation of the physician's art. Rather than attempt to construct an abstract model to fix, regularize, and render the body's signs more "knowable" in the philosophical (i. e., universalized) sense (the Aristotelian ideal), Galen takes them on

48 Galen, *Translatio Arabica*, (1557), 177r: "verumtamen ipsius temperantia et ipsius equalitas non sunt secundum meliorem dispositionem equalitatis, sed est ei temperantia proprium." My translation; cf. Singer trans., 347.

49 For an exemplary introduction to Galenic medical theory, see Nancy Siraisi, *Medieval and Early Renaissance Medicine: An Introduction to Knowledge and Practice* (University of Chicago Press, 1990).

50 Luis Garcia Ballester, "Galen as a Medical Practitioner: Problems in Diagnosis," in *Galen: Problems and Prospects*, ed. Vivian Nutton (London: Wellcome Institute, 1981), 13–46, at 13.



their own shifting and hazy terms. He does so by marshaling a cluster of conceptual elements that are fitted to the unceasing flux of the living body and its ever-changing environment. At the head of these conceptual elements stands relativity itself.

It is not only that the body's parts function continually in relation to one another and to the whole, but he also insists that parts continually *move* and *change* in relation to each other within the whole. Motion itself is "in relation" throughout Galen's system, not only with respect to the functioning of the body's parts, but extending beyond function to the signs they produce, signs which the physician must learn to read. When, for example, Galen turns in the *Tegni* to a discussion comparing the complexional heat of the healthy heart relative to that of the other organs of the body (a critical theoretical and diagnostic element in his system), he begins with a general statement of relativity, noting that when one speaks of the greater heat, cold, dryness or moisture of a bodily part, these terms must be strictly understood as relative to that particular organ rather than to any other (*non ad aliam aliquam comparantes*). Thus, to take but one out of many examples he offers on this theme, even a comparatively cold heart must be understood as being relatively much hotter than the hottest brain.<sup>51</sup>

Furthermore, relativity extends past the reading of the internal organs to the reading of the external signs they offer as clues to the status of their interior complexions. Again, to take but one example out of scores offered in the single text of the *Tegni*:

*Breathing will be proportionate to the pulses, provided that the smallness of the chest is in proportion to the coldness of the heart; if the chest is larger than accords with the quantity of coldness (secundum quantitatem frigiditate cordis), the breathing will be not only smaller, but also slower and less frequent.*<sup>52</sup>

And Galen's relativism extends yet further and deeper, past the interior structures and motions of the body, past the body's exterior signs, to encompass the body's ever-changing relationship to the world surrounding and impinging upon it. For Galen, changes occurring within the body – the primary focus of the physician's attention – can only be understood when viewed in relation to the body's physical, social, and even psychological environments.<sup>53</sup> He insists, therefore, that the doctor must learn how to recognize the recurring patterns in this hugely complex and utterly relativized interchange. In the long medical tradition that followed his writings, Galen's list of "environmental" factors impinging on health came to be standardized and known under the heading "the non-naturals" (*res non naturales*). He provides one version of this list in the *Tegni*:

*And if we make a classification of all the necessary factors which alter the body, to each of these will correspond a specific type of healthy cause or cure. One cat-*

51 Galen, Singer trans., 357.

52 Galen, *Antiqua*, 11va: "Spiritus vero siquidem tanto minor torax sit quanto cor frigidius pulsui est proportionalis; si vero maior fuerit secundum quantitatem frigiditate cordis non minorem tamen sed tardiozem . . ." Singer trans., 358.

53 On the effects of the passions of the mind upon health, Galen writes in the *Tegni* (Singer trans., 376): "Obviously one must refrain from excess of all affections of the soul: anger, grief, pride, fear, envy, and worry; for these will change the natural composition of the body."

*egory is contact with the ambient air; another is the motion and rest of the body as a whole or of its individual parts. The third is sleep and waking; the fourth, substances taken into the body [such as food and drink]; the fifth, substances voided or retained; the sixth, what happens to and within the soul or psyche. The body cannot but stand in some relationship or other to all of these. (my emphasis)*<sup>54</sup>

Then to these relational or “environmental” factors, Galen adds a host of others, reiterating throughout his writings that age, sex, geography, occupation, climate, season, condition at birth, and still other shifting factors, both internal and external, all directly affect which state the doctor must learn to recognize as optimal for the particular body at hand, since it is toward the restoration of this essentially relativized optimal state that the doctor must strive.

*Now, since there are not just one, but many kinds of healthy bodies – as distinguished above – each will have its own cause of preservation, since, conversely, every cause is a cause in relation to a particular object.*<sup>55</sup>

Following this logic, every restorative drug and regimen the doctor prescribes must be considered and determined with respect to restoring the body to its relativized optimum state.

*When, for example, the body is in need of motion, exercise is healthy and rest morbid; when it is in need of a break, rest is healthy and exercise morbid. The same applies to food, drink, and so on.*<sup>56</sup>

What we have, in the end, are four nested systems: the immensely complex relational system of the living body itself; the relational system encompassing the body’s interactions with its ever-changing environments on multiple levels; the relational system formed between the body’s interior states and its exterior signs; and the relational system encompassing the myriad connections between the physician reading the signs and the sick body to be cured. Each of the four systems is shot through with relativized elements and determinations: there is not a comfortably fixed or absolute component among them. In short, in reading the *Tegni* or other of Galen’s writings, one senses that Galen fully intended his future readers to perceive the whole of the body’s systematic activity as floating on a sea of relativity.

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<sup>54</sup> Galen, *Arabica*, 199r: Singer trans., 374. The last line, “quia necesse est corpori, ut alteratur at mutetur ab omnibus istis causis,” could also be translated: “Because the body is necessarily altered and changed in relation to all these causes.”

<sup>55</sup> Galen, *Antiqua*, 13va: “Cum igitur sit non unum sanum corpus: sed plura quemadmodum determinatum est prius: secundum unum quodque eorum erit conservativa: quoniam et omnis causa ad aliquid est.” Singer trans., 373.

<sup>56</sup> Galen, *Arabica*, 200r: “quia quando corpus indigent motu, tunc exercitium est ei causa sanitatis, et quies causa aegritudinis; et quando corporis indigent ocio, tunc quies est causa sanitatis et exercitium causa aegritudinis. Et similiter est dispositio in cibis et potibus, et reliquis rebus aliis.” Singer trans., 375.

Medieval medical writings before the mid-thirteenth century, although at times influenced by Galenic thought, do not seem to have been capable of digesting the thoroughgoing relativism of his system. In my reading, even the great Avicenna (981–1037) is too much the philosopher, too intent on universalizing on the model of Aristotle, to capture Galen’s continual play of relativity and uncertainty, even though he captures many other aspects of the Galenic system in his magisterial and immense *Canon of Medicine*. But toward the end of the thirteenth century, we can see scholastic culture opening up more fully to the lessons of Galenic relativism.

Taddeo Alderotti (c. 1210–1295) is frequently recognized as the first major scholastic expositor of Galenic medicine.<sup>57</sup> In the 1260’s and 70’s, while a practicing physician and professor of medicine at the University of Bologna, Taddeo wrote a series of commentaries on medical works in the scholastic style, including the first scholastic commentary on Galen’s *Tegni*.<sup>58</sup> Through a series of *quaestiones*, *distinctiones*, and *dubia* he sought to integrate the teachings of Galen with those of Aristotle, relying heavily on earlier Arabic commentators in the process, particularly Avicenna’s *Canon*. Taddeo’s most concentrated discussion of relativity appears in his commentary to the *Isagoge* of Johannitius (the Latinized name of Hunain ibn Ishaq’, (808–873)), which was itself a highly condensed summary of the Galenic system.<sup>59</sup>

At one point in this commentary, Taddeo comes to the pivotal question of the definition of health: how must the *medicus* think of health, and how must he use this definition in his practice of restoration. He understands that for Galen and all Galenists, bodily health is identified with complexional balance or “equality” (*aequalitas*) – the proper proportionally balanced blend of the four primary “qualities”: heat, cold, wetness, and dryness. At one point, Taddeo, following Galen, devotes more than three folio columns to demonstrating that the equality of concern to the *medicus* can only be understood relative to the individual’s “natural complexion” and to the specific potential of the body (and each bodily part) for attaining a well-proportioned equality.<sup>60</sup>

Then, to further explore the necessity of relativizing the very notion of equality/balance when applied to the living body, Taddeo turns to the Galenic discourse on the influence of climate and ethnicity on norms of complexional *aequalitas*. He begins by writing that although the human species, as a whole, possesses an equal/balanced complexion in relation to all other living species, there are, nevertheless, parts of the species – particular individuals – who possess a relatively “more equal complexion” than the standard for the species.<sup>61</sup> Moreover, within each individual, equality of

57 For a masterful assessment of Taddeo’s writings and his importance to scholastic medicine, see Nancy Siraisi, *Taddeo Alderotti and his Pupils: Two Generations of Italian Medical Learning* (Princeton University Press, 1981).

58 *Thaddei Florentini Medicorum sua tempestate principis in C. Gal. Micratechnen Commentarii* (Naples, 1522). For a bibliography of Taddeo’s writings, including his commentaries on sections of the *Canon*, see Siraisi, *Taddeo and his Students*, 39. 105 n. 26, 416–18.

59 *In subtilissimum Joannitii Hagogarum libellum*, in *Thaddei Florentini Expositiones* (Venice, ad Iuntas, 1527), fol. 343r–400r. (This work can be consulted at <http://gallica.bnf.fr/ark:/12148/bpt6k60540.t>). For Siraisi’s judgment that Taddeo’s *Isagoge* commentary contains his deepest theoretical exploration of the Galenic corpus, see *Taddeo and his Pupils*, 40.

60 Taddeo, *Commentary on the Isagoge*, 346va–347rb.

61 Taddeo, *Commentary on the Isagoge*, 346va.

complexion is determined relative to age, with different qualitative proportions proper to different age groups. Then, equality must be considered relative to climate and ethnicity, with certain complexions being more proper to certain *gens* living in certain climates than to others.<sup>62</sup> But even within each *gens* and each climate, some individuals possess a greater equality of complexion in comparison with others.<sup>63</sup> And within each individual – even those of exceptionally equal complexion – there are certain stages in life when the equality is more and other stages where it is less.<sup>64</sup> But even this is not the end of the matter, for some bodily parts possess equality to a greater degree than other parts, and, moreover, each organ or part possesses a sometimes more and sometimes less equal complexion in relation to itself at other times.<sup>65</sup> Then, as if to impart a final lesson, Taddeo reminds his readers:

*Plato can be cold in relation to (per comparationem ad) the medium for the human species and yet hot in relation to (relatus ad) Martin, and similarly the dog is said to be hot in relation to (relatus ad) humans and cold in relation to (relatus ad) the lion.*<sup>66</sup>

With this discussion, Taddeo demonstrates that he has clearly grasped the taxonomy of Galenic relativity, even if his deployment of it, in this and other of his writings, remains rather schematic. To my eyes, he has not yet learned to apply relativity as his primary way of thinking and seeing: he lacks Galen's sense of the body (and of the *medicus* himself) as afloat in a sea of relativity. This sense does, however, become ever more apparent in the Galenic commentaries written in the generations that follow.

To a remarkable degree, Galen succeeded in capturing and conveying his many-layered treatment of relativity through the rhetorical strategy he consistently employed. Unable to be physically present in the teaching of his complex art, he managed to insert himself as an active and deliberating subject into his texts. His prose is patterned not only toward the learning of the body's structure but toward the apprehension of its living rhythms and the continual relational interplay of its moving parts. Personally speaking, I have never read anything that approaches Galen's writing in terms of its rhetorical ambitions and its resulting effectiveness as a teaching tool. It is this above all that has convinced me of its capacity to "teach" relativity in a way I hadn't thought possible of texts themselves before my study of his writings.

Although in this case I allow significant weight to Galen's writings in contributing to the "new relativism," I remain aware that the reading of any text or set of texts takes place in personal/social/historical contexts that can greatly affect the meaning drawn from them, can greatly affect the judgment of which insights and modes of thinking

62 Taddeo, *Commentary on the Isagoge*, 346va.

63 Taddeo, *Commentary on the Isagoge*, 346va–vb.

64 Taddeo, *Commentary on the Isagoge*, 346vb.

65 Taddeo, *Commentary on the Isagoge*, 346vb.

66 Taddeo, *Commentary on the Isagoge*, 347rb: "et hoc modo dicitur quod Plato cum sit frigidus per comparationem ad medium in genere hominis esset calidus relatus ad Martini, similiter dicitur canis relatus ad hominem calidus, et relatus ad leonem frigidus."

seem more “fitting” and productive and are thus more likely to be communicated. Thus, even given the pride of place that Galen allowed to relativism in his vision and understanding of the human body, I want to argue that the more links and overlappings there were between the lessons in relativity Galen conveyed through his texts, and the lessons in relativity scholastics learned through their direct observation and experience of the marketplace, the deeper and more complete were the effects of his writings on their receiving minds.

Paris in the first half of the fourteenth century was at the height of its commercial development in the medieval period, a height it would not achieve again for almost two centuries following the devastating outbreak of the Black Death in 1348.<sup>67</sup> In this respect, consider that Galen constructed his own remarkable understanding of the working human body while immersed in the social and political life of a megalopolis at the furthest stage of its imperial expansion – Rome of the second century CE. Consider, too, that at points in his writings, he reveals the links that he himself sensed between his social environment and his ideation, and, specifically, between the governance and functioning of the working city he lived in and his theoretical modeling of the working body.<sup>68</sup>

No scholastic thinker explicitly credits Galen or Galenic medicine directly as the source of his relational thinking. There is proof, however, that both Buridan and Oresme read Galen (in the case of Buridan, clearly the *Tegni*), and both employ Galenic examples to support relativized positions in their speculations.<sup>69</sup> In Oresme’s prologue to his French translation and commentary on Aristotle’s *Politics* (*Le livre de Politiques d’Aristote*, written in the same half-decade as his commentary on Aristotle’s *De caelo* mentioned above), he refers to Galen and applies relativized Galenic insights to political theory and contemporary political life at three separate points.<sup>70</sup> Following the *Prologue*, Oresme continues to employ Galenic terminology and to mention Galen by name where he finds his insights applicable.<sup>71</sup> In, for example, an argument against

67 For this judgment, see Raymond Cazelles, *Nouvelle Histoire de Paris de la fin du règne de Philippe Auguste à la mort de Charles V, 1223–1380* (Paris: Hachette, 1972), 9, 124.

68 Galen, *De usu partium* IV.1, IV.2, *On the Usefulness of the Parts of the Body*, ed. and trans. Margaret Tallmadge May (Ithaca, NY: Cornell University Press, 1968), 204–5. For an expanded discussion on this point, see *A History of Balance*, 468–70.

69 Buridan’s most direct application of Galen’s writing appears in his commentary on the Pseudo-Aristotelian *Physiognomy*. On this, see Joseph Ziegler, “Philosophers and Physicians on the Scientific Validity of Latin Physiognomy, 1200–1500,” *Early Science and Medicine* 12 (2007), 285–312, esp. 291. For more evidence of Buridan’s grasp of the complex workings of the relativized medical body, see his commentary to *Ethics*, V, 25 [1513], 42rv–42vb.

70 See *Maistre Nicole Oresme: Le Livre de Politiques d’Aristote*, ed. A. D. Menut, *Transactions of the American Philosophical Society*, 60:6 (1970). In another work (*De causis mirabilium*), Oresme refers to Galen’s writings more than a half-dozen times and frequently, as well, to Avicenna’s *Canon*, which functioned partly as a summary of Galen’s medical writings. See *Nicole Oresme and the Marvels of Nature, The De causis mirabilium*, ed. Bert Hansen (Toronto: Pontifical Institute, 1985), in the general index under “Galen.”

71 E.g., *Politiques*, 65a, 77a, 144b, 165b, 184b, 209b, 240b, 289b–290a, 322a, 332b, 339b. On the connections between the medical faculty and the faculty of theology at the University of Paris in the fourteenth century, see William Courtenay, “Curers of Body and Soul: Medical Doctors as Theologians,” in *Religion and Medicine in the Middle Ages*, ed. Peter Biller and Joseph Ziegler (Woodbridge, Suffolk: York Medieval Press, 2001), 69–75.

the assertion that there is an absolute ideal that all political bodies should strive to attain, Oresme writes:

*As it happens, it is not possible for a human body to be perfectly healthy or to have the kind of complexion that the doctors call “perfectly balanced” (temperamentum ad justitiam). Instead they consider what kind of body they have before them, and they work to approach the complexion and form of health most expedient for that body, determined by what is possible for it to achieve.<sup>72</sup>*

Here Oresme clearly demonstrates that he has mastered a major lesson in relativized seeing and thinking elaborated within Galenic medicine.

At this point we can only imagine what the intellectual effects might have been when scholastic authors trained outside the sphere of medicine, such as Buridan or Oresme, came to the reading of Galen and/or contemporary Galenic writings. In almost every case, this would have happened after they had already received years of intense training in Aristotelian logic and philosophy at university. They would also have spent their long student and early teaching years surrounded by and continually interacting with the vibrant urban marketplace of Paris (or, for that matter, Bologna, Padua, Montpellier, Oxford and other major university centers in this period.) My sense is that in this intellectual and social context, the experience of reading Galen could well have deepened their grasp of the logic underlying relativized systems and significantly increased their capacity to view the world and its workings in relativized terms.

To reiterate and conclude: in my view a conceptual break of the rare degree and kind that characterizes the “new relativism,” arose, and perhaps could only have arisen, through a complex interchange between text and socio-economic context; between the power of Galen’s writings, the intellectual environment of scholastic training in which his writings were read, and the urban and commercialized environment in which the university, along with its scholars, were deeply and daily embedded. But I believe, and I would like to propose, that the same complex interchange of text and socio-economic context at work in the case of the new relativism – which between the late-thirteenth and mid-fourteenth century transformed the way the world and its workings could be seen and understood – has its parallels in all cases of similarly profound intellectual transformation, wherever they have occurred, right into the present.

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<sup>72</sup> *Politiques*, 322a: “Car par aventure il ne est pas possible que un corps humain soit tres parfaitement sain et que sa *complexion* ait ce que les medecins appellent *temperamentum ad justitiam*. Et toutesvoies, il considerent quel corps ce seroit et tendent a approchier de tele *complexion* et de tele sante’ selon ce qu’il est expedient pour le corps et selon ce qu’il leur est possible.” (My emphasis.)

**Abstract**

By the second quarter of the fourteenth century, in the writings of leading scholastic natural philosophers, there is ample evidence of a newly relativized world view, one sufficiently well developed to make possible a profound re-visioning of society, nature, and the cosmos. Its formation and elaboration represents one of the great achievements of late medieval intellectual culture. This paper investigates the intersection of social, material, and textual factors that underlay and made possible a re-visioning of this magnitude.

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