

HEAT AND MOISTURE. FROM THE CLASSIFICATION OF FEVERS TO THE 'TRUTH OF HUMAN NATURE'

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Abstract: The first part of the essay examines the different premises, of Aristotelian and Galenic origin, for the idea of an inherent consumption of the natural heat of every living body, discussing the contributions of Isaac Israeli, Avicenna and Averroes to the reflection on the relationship between the secondary humours (or moistures) and the peculiar category of fevers called 'hectic'. The second part of the article discusses how the link between moisture, heat and food was taken up and elaborated by Latin Scholastic masters (in particular Thomas Aquinas), and considers the use of the notion of 'radical moisture' in the field of theology. Aquinas does not follow the previous theological tradition, originating with Peter Lombard, which denies the possibility that the matter assimilated through food is part of the bodily core that belongs to every human being from birth. The moisture provided by food is, in fact, inseparable from the (radical) moisture that originally belongs to each individual; as such, it is part of the 'truth of human nature' (*veritas humanae naturae*) that will be restored at the moment of the resurrection of the body.

Keywords: Aristotle; Galen; Isaac Israeli; Avicenna; Averroes; Thomas Aquinas; taxonomy of fevers; hectic fever; taxonomy of moistures; radical moisture; innate heat; truth of human nature.

1.

In justifying the varying (natural) length of human life, Dante refers in the 4th treatise of the *Banquet* to the quantity and quality of the radical moisture that is specific to each individual:

Ed è da sapere che questo arco [di giù, come l'arco] di su sarebbe eguale, se la materia della nostra seminale complessione non impedisse la regola della umana natura. Ma però che l'umido radicale [è] meno e più, e di migliore qualitate [e men buona], e più ha durare [in uno] che in uno altro effetto – lo quale [è] su-

bietto e nutrimento del calore che è nostra vita –, avviene che l'arco della vita d'un uomo è di minore e di maggiore tesa che quello dell'altro (Cv IV XXIII 7).¹

Dante is writing here in the context of the complex explanation of the biological and embryological conditions that, together with celestial influence, predispose to nobility.² His words are evidence of what has been called the “*presenza ubiquitaria e consistente*”³ of the notion of radical moisture, not only in medicine, but also in medieval (and scholastic in particular) philosophy and theology. Ultimately, radical moisture is the fundamental principle (and at the same time the main indicator) of the existence of every living thing, man included: life and the duration of life depend, in natural terms, on the relationship between moisture and heat, or, more precisely, on the consumption of radical or original moisture by vital heat.⁴

In what follows, drawing on some of my earlier work,⁵ I would like to try to retrace some fundamental junctures in the history of the notion of radical moisture in medieval medical and philosophical thought. I will dwell in particular – taking the point of view of Thomas Aquinas – on the question of how moisture can be partly restored through nutrition and how it contributes to what essentially defines the identity of each human being (i.e., to use the technical expression, the *veritas humanae naturae*).

1 NARDI 1967.

2 See, e.g., PORRO 2019.

3 See CRISCIANI, FERRARI 2010, 343.

4 HALL 1971; McVAUGH 1974; FERRARI 2005 and CRISCIANI 2005; FERRARI 2013. On radical moisture, see also REYNOLDS 1999; DUNNE 2009; POMATA 2018; BENEDUCE 2019.

5 ZUCCOLIN 2022 and ZUCCOLIN 2020.

2.

Medieval authors refer to radical moisture in at least three areas: the duration of life; a specific pathology, that of a class of fevers; and the theological issue of the numerical identity between the living body and the resurrected body. The origins of the medieval discussions on moisture typically depend (in both the Arabic and Latin contexts) on the confluence and overlapping of elements from the Aristotelian and Galenic traditions. Already present in the Hippocratic corpus, the polarity between heat and moisture is explicitly thematised in several places by Aristotle, in particular in the *Parva naturalia*. In *De longitudine et brevitae vitae*, the loss of moisture (desiccation) is seen as the decay of living beings (old age, and ultimately death):

We must remember that an animal is by nature humid and warm, and to live is to be of such a constitution, while old age is dry and cold, and so is a corpse. This is plain to observation. But the material constituting the bodies of all animals consists of the following – the hot and the cold, the dry and the moist. Hence when they age they must become dry, and therefore the fluid in them requires to be not easily dried up. [...] Again the humid element in animals must not be small in quantity, for a small quantity is easily dried up. This is why both plants and animals that are large are, as a general rule, longer-lived than the rest, as was said before; it is to be expected that the larger should contain more moisture.⁶

But the quantity of moisture alone is not enough to ensure a longer life; as we learn in Dante, the quality of the moisture, that is to say its ability to resist desiccation, is also important. Moisture and heat are not understood, in this context, as merely opposing principles. Rather they are synergetic, so much so that Aristotle specifies that “moisture must be not only great in amount but also warm, in order to be neither easily congealed nor easily dried up.”⁷

⁶ *De longitudine et brevitae vitae*, 5, 466a18–8; ARISTOTLE 1984, vol. 1, 1631.

⁷ *De longitudine et brevitae vitae*, 5, 466a30–32; ARISTOTLE 1984, vol. 1, 1631.

Indeed, even heat can help prevent desiccation; for example, if it originates from fat. On the other hand, the degeneration and progressive corruption of living bodies are favoured by the accumulation of residues (which also belong to the sphere of 'moisture'): the excess of superfluous material determines the onset of disease and can ultimately lead to natural death. "This is why" – as Aristotle adds (taking up another Hippocratic principle) – "animals that copulate frequently and those abounding in seed age quickly; the seed is a residue (περίπτωση) , and further, by being lost, it produces dryness."⁸ Fatigue also contributes to desiccation. Aristotle, in this way, understands warm moisture as the cause of growth and life.⁹ However, Aristotle also concedes that heat can consume its own matter:

Both plants and animals perish if not fed, for in that case they consume themselves; just as a large flame consumes and burns up a small one by using up its nutriment, so the natural warmth which is the primary cause of digestion consumes the material in which it is located.¹⁰

The basic idea is that the natural heat of living beings prevails over hot moisture. Natural heat does this in the way that a larger flame absorbs and consumes a smaller one, taking away from it what feeds it (the fuel, i.e., in this case, the moisture).¹¹ The connection between heat and moisture is clear in Aristotle's *De iuventute et senectute, de vita et morte, de respiratione*, where it seems that it is innate natural heat – rather than moisture – that is to be used up gradually until death: "in animals all the members and the whole body possess some connate natural heat, and hence when alive they are observed

8 *De longitudine et brevitae vitae*, 5, 466b7–9; ARISTOTLE 1984, vol. 1, 1632.

9 *De longitudine et brevitae vitae*, 5, 466b21–22.

10 *De longitudine et brevitae vitae*, 5, 466b28–33; ARISTOTLE 1984, vol. 1, 1633.

11 That the nourishment of heat, and of every vital process in general, is moisture, is specified by Aristotle in several places. See e.g. ARISTOTELES 1957, *Metaphysica*, I, 3, 983b20–24.

to be warm, but when dead and deprived of life they are the opposite.”¹² This apparent contrast is explained by the fact that heat can be extinguished in two ways, namely by consumption or by actual extinguishing:

However, it is to be noticed that there are two ways in which fire ceases to exist; it may go out either by exhaustion or by extinction. That which is self-caused we call exhaustion, that due to its opposite is extinction. But either of these ways in which fire ceases to be may be brought about by the same cause, for, when there is a deficiency of nutriment and the warmth can obtain no maintenance, the fire fails; and the reason is that the opposite, checking digestion, prevents the fire from being fed.¹³

But when it is not the opposite principle that causes the extinguishing, it is the heat itself that is self-extinguishing by consuming what feeds it:

But in other cases the result is exhaustion – when the heat accumulates excessively owing to lack of respiration and of refrigeration. For the heat, accumulating in great quantity, quickly uses up its nutriment and consumes it all before more is sent up by exhalation.¹⁴

Here, perhaps for the first time in the long history of writing on the interaction between heat and moisture, the example of the lantern appears. This image would later be declined in very different ways in medieval compositions on radical moisture:

12 *De iuventute et senectute, de vita et morte, de respiratione*, 4, 469b6–10; ARISTOTLE 1984, vol. 1, 1644. See also 469b18–20: ARISTOTLE 1984, vol. 1, 1644: “Hence, of necessity, life must be simultaneous with the maintenance of heat, and what we call death is its destruction.”

13 *De iuventute et senectute, de vita et morte, de respiratione*, 5, 469b21–27; ARISTOTLE 1984, vol. 1, 1644.

14 *De iuventute et senectute, de vita et morte, de respiratione*, 5, 469b27–31; ARISTOTLE 1984, vol. 1, 1644–1645. And a little further on (*De iuventute et senectute, de vita et morte, de respiratione*, 14, 474b20–22; ARISTOTLE 1984, vol. 1, 1659): “if there is too much heat close at hand and the thing burning does not have a fresh supply of fuel added to it, it goes out by exhaustion, not by the action of cold.”

Hence not only is a smaller fire readily put out by a larger one, but of itself the lamp's flame is consumed when inserted in a large blaze, just as is the case with any other combustible. The reason is that the nutriment in the flame is seized by the larger one before fresh fuel can be added [...].¹⁵

For Aristotle, then, the case of the oil lamp is just a more specific example of what we read in *De longitudine e breuitate vitae*, namely that a larger fire extinguishes a smaller one by taking from it what feeds it (this example will take on a different meaning – as we shall see – in the Galenic tradition). If, therefore, heat is extinguished by the opposite quality (cold), it is consumed when it is excessive: hence the need for cooling, which is ensured by respiration. Desiccation – the dissolution of vital moisture – is thus a process that can be attributed to the overwhelming prevalence of heat itself, which consumes all its substrate, i.e. to self-dissolution:

The source of life is lost to its possessors when the heat with which it is bound up is no longer tempered by cooling, for [...] it is consumed by itself.¹⁶

It is, therefore, not surprising that, in the Galenic tradition, the theme of the imbalance in the balanced relationship between heat and moisture is linked to the treatment of febrile pathologies. There excessive, hence unnatural (and somewhat extrinsic) and aggressive heat comes into play. The Galenic approach starts from a different assumption than the Aristotelian one, as Niebyl has already shown:¹⁷ natural or innate heat (*émphutos*) is always temperate, while acquired heat (*epíktētos*) is non-temperate (*akratos*) and indeed almost

15 *De iuventute et senectute, de vita et morte, de respiratione*, 5, 469b31–470a1; ARISTOTLE 1984, vol. 1, 1645.

16 *De iuventute et senectute, de vita et morte, de respiratione*, 23, 479a7–10; ARISTOTLE 1984, vol. 1, 1671.

17 See NIEBYL 1971.

igneous (*purōdes*).¹⁸ Such an approach inevitably downplays the idea that one can speak of intrinsic consumption or corruption of the natural heat proper to every living thing: a natural principle cannot in itself be destructive, let alone lead to nefarious outcomes. In his treatise on marasmus, Galen thus polemizes against those who admit the self-extinction of heat by the progressive consumption of the moisture on which it feeds, and compares innate heat to fire or flame:

It is claimed by some people that, in the same way, the heat within us, being inseparable from the body, as if it were inseparable from some substance, is originally humid and weak; but as the body reaches the prime of life, the heat grows and acquires its greater strength, and acts in the same way as do the flames of a fire. Shortly, though, in old age, the heat starts fading because of lack of fuel, and it finally goes out completely in death. This explanation is accepted by almost all the newer philosophers and physicians, although it is not true; and if I am to judge a comparison of the flames of a fire to the heat of the animals, I do not quite understand, namely, how one can compare the destruction of matter by fire with the creation of matter by the internal heat of the animals. For what is seen happening in the case of a fire does not happen in growing animals which are instead controlled by their innate heat, which is constantly spreading and carrying powers other than those which are its direct results.¹⁹

The metaphor of fire, which we have seen used explicitly by Aristotle, is thus in Galen's eyes entirely inappropriate: it is an error to confuse the formative and constructive action of innate heat with the destructive action of fire.²⁰ It is true that Galen, with hermeneutic charity, acknowledges that Aristotle would have distinguished intrinsic heat from extrinsic fire or fire as an element, on

18 See GALENUS 1825(1), *De causis pulsuum*, III, 129.

19 Quoted from THEOHARIDES 1971, 375–376.

20 See also, for example, GALENUS 2011, *Method of Medicine*, 141 (GALENUS 1825(2), *De methodo medendi*, XI, 753): “What, then, is the nature of putrefaction? It is the change of the whole putrefying substance of the body toward corruption due to external heat. For it is surely not due to its own heat that something is corrupted; on the contrary, each and every living thing is increased, strengthened, made healthy and lives when governed by its own heat.”

the basis of the distinction between the 'digestive' function of innate heat and the corruptive or putrefactive nature of extrinsic or elemental fire.²¹ But it is also clear that, unlike Aristotle, Galen focuses his attention primarily on pathological, extrinsic alterations in the balance between heat and moisture.

External heat is generally produced by fevers. To be more precise: if *marasmus* (*marasmós*, a term used by Galen alongside the more common *máransis*, 'withering') refers to the corruption of the human body by desiccation, we must distinguish between simple atrophy (due, for example, to lack of nourishment) and more complex atrophy associated either with cold – in the case of ageing – or with heat – in the case of 'consumptive' or 'hectic' fevers. The term used by Galen – *hektikós* – derives from *héxis*, 'habit': fevers that, through their unnatural heat, consume the living body's own moisture are thus 'habitual' fevers (as opposed, for example, to 'ephemeral' ones). This febrile state is the final stage in a process that successively affects the moisture on which the solid limbs feed, then the soft parts, and finally the more solid limbs. Such a course is actually described in slightly different terms in the works of Galen, for instance, in the aforementioned *De marasmo* (written before the death of Marcus Aurelius, that is, before 180) and in the *Methodus medendi*, book X (whose writing is usually placed, together with Books VII–XIV, after 193). In the first case, Galen seems to be referring to two distinct affections (which would give rise to two different temperaments), one relating to the moisture that nourishes the soft parts, and the other to the moisture that nourishes the solid parts:

There are two different temperaments of people who become thin in this way, and they must be discussed separately. Thus, one wasting affection arises when the humor of the solid parts, which we call the proper nourishment of these

²¹ See GALENUS 1824, *De differentiis febrium*, XI, 374–375.

parts, perishes, afterwards the soft fleshy parts are liquified; the other affection attacks the solid parts, which we call both primary and homogeneous. This latter case is incurable, just as is aging. The first case is dangerous, but by no means incurable.²²

In *De methodo medendi*, however, the idea of a more or less linear progression between three different stages is suggested:

In the first place, such a fever consumes the proper moisture [*tên oikeían ikmáda*] of the parts from which they are nourished. From here, it passes to the fleshy class, which grows around the fibrous and membranous parts of the solid bodies. Then, in this way, it also involves the solid parts themselves.²³

In any case, the last phase – the one that leads to pathological marasmus (and not to ‘physiological’ marasmus, due to ageing) – is due to the persistence of the ‘hectic’ or habitual fever, which erodes the proper moisture inherent in solid limbs. In *De differentiis februm* (which, like *De marasmo*, is usually dated to the second Roman sojourn, before the death of Marcus Aurelius) the characteristic element of ‘hectic’ fevers is precisely that they affect the solid parts, unlike putrid fevers which affect the primary humours (blood, phlegm, yellow bile and black bile).²⁴ In the same work, Galen uses the example of the oil lamp, mainly to liken the desiccation of the heart to that of a wick that has been lit too many times: not even sprinkling it with oil would rekindle the flame.²⁵

22 THEOHARIDES 1971, 383.

23 GALENUS 2011, *Method of Medicine*, 107 (GALENUS 1825(2), *De methodo medendi*, X, 730).

24 See GALENUS 1824, *De differentiis februm*, I, c. 9, 304.

25 See GALENUS 1824, *De differentiis februm*, I, c. 10, 314.

3.

In the Arabic and Latin Middle Ages, this Galenic line to some extent imposes itself, overlapping with Aristotelianism, albeit through bumpy events that have been reconstructed by McVaugh, Crisciani and Ferrari.²⁶ The *De differentiis febrium* was translated into Latin by Burgundio of Pisa in the second half of the 12th century. The *De methodo medendi* was also translated into Latin (twice) in the 12th century: by Gerard of Cremona, under the title *De ingenio sanitatis* (according to the attribution of several manuscripts, despite the fact that the work does not appear in the list of Gerard's translations compiled by his pupils), and by Burgundio da Pisa, under the title *Terapeutica*, limited to Books VII–XIV.²⁷ However, a widely circulated paraphrase of the work (translated from Arabic) by Constantinus Africanus was already known, under the title *Megategni*, from the last quarter of the 11th century. And even earlier – from the beginning of the 11th century – Isaac Israeli's *Liber febrium* circulated in the West. This, as McVaugh again points out,²⁸ is the first text to convey the Galenic taxonomy of fevers in the Latin world, and along with it the idea that a particular type of fever (the 'hectic' ones, which generally become *ethicae* in Latin) affects the moisture found in the organs of the human body; ephemeral fevers, note, affect the spirits, and putrid fevers the primary humours.

An element that becomes characteristic, starting with the *Liber febrium*, is the intersection or overlap between the doctrine of bodily moisture and dis-

²⁶ See *supra*, n. 3 and 4.

²⁷ The translation would be continued by Pietro d'Abano in the following century. Burgundius was also responsible for the translation of books III–IV of *De causis pulsuum*. As for *Ad Glauconem de methodo medendi*, it was accessible in Latin, under the title *De febribus ad Glauconem*, thanks to an anonymous translation made as early as the 5th–6th century, but one that is rather different from the Greek original.

²⁸ McVAUGH 1974, 259–261.

cussion of the different types of digestion. Food undergoes three distinct processes of digestion or ‘coction’ in the human body: the first takes place in the stomach; the second in the liver, and produces the venous blood; the third is that which takes place from the venous blood and ends with the complete assimilation of the nutritive moisture into the solid organs of the body. This third process of digestion can be further divided into four stages, although the first two are still properly preliminary: in the first, the moisture flows through the veins waiting to be assimilated (i.e., to be drawn or attracted by the various organs); in the second, it is distributed in the cavities between the organs; in the third, it is in the organs (and this is the beginning of the third digestion *stricto sensu*), but it is not yet fully assimilated and coagulated, as is observed in the soft parts; in the fourth, the moisture is fully assimilated into the solid organs of the body.

Three different species of ‘hectic’ fever are distinguished on the basis of these four phases (*Igitur quia corporea humiditas quadruplex est, necessario species ethice tres sunt*). The parallel described in the *Liber Februm* is that between the fourth moisture, fully assimilated in the solid part, and ripe wheat or raisins, which does not in itself render these substances rotten, but rather protects them from rotting.²⁹ We can try to schematise these phases as follows:

29 ISAAC ISRAELI 1515, *Liber de febribus*, f. 208rb (folium erroneously numbered as 198): “Ethica vero quattuor modis est. Causa est, quia humores sunt quattuor. Unus est in vasis sanguineis [*ed.*: sanguineus] sicut humor in venis existens sicut humiditas arborum terrequenascentium [*sic*] permanens in summitatibus eorum, velut humiditas in ramis vitis existens. Secundus est humiditas existens in concavitate membrorum, in quibus natura nondum tertiam fecit digestionem, nec eam membris assimilavit, sicut est aquosa humiditas que est in arboribus et terrenascentibus, et velut humiditas que est in frumento et uvis nondum maturis. Tertius humiditas est membrorum in quam natura incipit operare, sed tamen non coagulavit neque perfecit eam sicut est caro tenera que non est membris assimilata, et sicut humiditas frumenti que cepit coagulari et saporifera fieri, et mollis tamen adhuc permanet et humiditas uve coagulari et dulcis fieri incipiens, sed tamen non est desiccata nec ad duriciem conversa. Quartus est humiditas membra regens et custodiens sicut humiditas in membris coagulata, et ad duriciem conversa et cum membris unum effecta, sicut humiditas frumenti assimilata, illud ne putrefiat cu-

Third diges- tion	Preparation	Moisture in- side the veins	Moisture within tree branches	
		Moisture in the cavities of or- gans	Moisture in- side unripe wheat and grapes	First species of 'hectic' fever. Curable
	Completion	Moisture in- side the or- gans, but not yet assimilated	Moisture in wheat and grapes as they begin to ripen and de- velop flavour	Second spe- cies of 'hectic' fever. Curable
		Coagulated moisture inside the organs, al- lowing them to be preserved	Fully assimil- ated mois- ture in ripe wheat and grapes	Third species of 'hectic' fever. Incur- able

The numerical discrepancy between the types of moistures and the species of fever can be explained by considering that the first type of moisture is still in the blood – a humour which, as already mentioned, is the subject of putrid fevers, and not of 'hectic' ones. The third species of 'hectic' (or habitual or 'ethical') fever is incurable. This is because the unnatural heat induced by the fever itself (and spread through the body by the heart, as is the case with natural heat) works on the moisture assimilated in the organs. It does so in the same way as the heat of the sun works on stone and wood, producing, albeit over a much longer period of time, the same effects as elemental fire. These

stodiens, et sicut humiditas uvarum passarum substantiam earum ne putrefiant obser-
vans. *Igitur quia corporea humiditas quadruplex est, necessario species ethice tres sunt.* Una est
humiditas in membris permanens, in qua natura nondum tertiam digestionem operata
est, neque membris eam assimilavit. Secunda membrorum est humiditas qua operari
natura iam incepit, sed tamen non coagulavit neque eam perfecit. Tertia est substantia-
lis humiditas qua reguntur et custodiuntur membra” (the italic is mine). See also FERRE,
DELGADO 2015.

effects would be the calcining of stones and the reduction of wood almost to ashes, which is equivalent to desiccation in inanimate compounds.³⁰ It is no coincidence that in the modern age, *phthisis* – that is consumption and general deterioration – will be considered a paradigmatic form of ‘hectic’ or habitual fever, such as to compromise the patient’s general condition.

The connection between the processes of digestion or ‘coction’ and moisture that appears in Isaac Israeli is found a few decades later in Avicenna’s *Canon*, which was to become one of the main, if not the main, conduit for Greek-Arabic discussions on the role of moisture(s) in the Latin West. The most innovative aspect of Avicenna’s approach is his choice to address the question of the function of moisture not only in connection with febrile pathologies, but in the presentation of the basic concepts of medical science and the constitution of the human body. Avicenna, in short, proposes a *physiology*, and not just a *pathology* of moisture. Consider his general definition of humour or moisture: “Humor est corpus humidum liquidum in quod in primis nutriens convertitur”, “Humour [or moisture] is a liquid humid body into which nourishment is transformed in first instance.”³¹ It is no coincidence that this is immediately followed by the distinction between good and bad humours:

Eius vero est humor bonus, et est illud de cuius proprietate est ut fiat pars substantie nutriti solus vel cum alio, et assimilari ei solus vel cum alio, et in summa materia restaurationis eius quod ex ea dissolvitur. Et eius superfluitas est humor malus est quod istud agere non convenit, aut raro in bonum convertitur honor, unde antea a corpore expelli et proijci debet.³²

30 ISAAC ISRAELI 1515, *Liber de febribus*, f. 208va.

31 AVICENNA 1507, *Canon medicinae*, I, fen 1, doct. 4, c. 1 (“Quid sit humor et eius divisiones”), f. 4va.

32 AVICENNA 1507, *Canon medicinae* I, fen 1, doct. 4, c. 1, f. 4va.

The ‘good’ humours, then, are those which become part of the substance of the person who takes food, are assimilated and that contribute to the restoration of what is constantly being consumed or dissolved. The ‘bad’ humours are those which do not fulfil this function, and thus constitute superfluous residues whose accumulation is harmful to the organism. On the basis of this definition, Avicenna proposes a taxonomy of the organic humours, which has the great merit of explicitly coordinating, perhaps for the first time, the four primary humours with the other humours of the human body, subdivided precisely into *superfluitates* and *non-superfluitates*.³³ The more complete picture that can be drawn is as follows:

primary humours	secondary humours	
blood	non-superfluous	superfluous
yellow bile	1. humour contained in the pores of the extremities of the small veins supplying the simple organs	expelled from the body
black bile	2. humour spread through the simple organs like dew (<i>ros</i>), suitable for conversion into nourishment	
phlegm	3. humour already converted into the substance of the organs as for its	

33 AVICENNA 1507, *Canon medicinae*, I, fen 1, doctr. 4, c. 1, f. 4va: “Et que sunt non superfluitates sunt humores qui a principali dispositione conversi membris delegati fuerunt: sed nondum alicuius membrorum simplicium operatione perfecta pars effecti sunt: quorum sunt quatuor species. Una est humor in foraminibus extremitatum parvarum venarum contentus membris simplicibus propinquare inbibentium eam. Alia est humor per omnia simplicia [*ed.: simplicibus*] transiens membra, sicut ros qui in nutrimentum converti est aptus cum corpus nutrimento caret, et ut membra humectet cum aliqua causa, fortis motus aut alia, ea exiccaverit. Tertia est humor qui parum ante congelatus fuit, et est nutrimentum quod in substantia membrorum ex parte complexionis conversum est. Sed ex parte essentie complete et similitudinis nondum conversum fuit. Quarta est humor qui est intus in membris simplicibus a principio nativitatis per quem partium eorum continuitas existit, cuius principium est ex spermate. Spermatidis vero principium est ex humoribus.”

	<i>complexio</i> , but not as far as complete essence and similarity are concerned	
	4. humour contained in the simple organs from birth, originating from sperm and ensuring the continuity of the parts	

The most problematic aspect of this arrangement seems to be the transition between the third and fourth non-superfluous secondary humidities. It is not quite clear, in fact, whether the fourth moisture (which has the fundamental function of ensuring the continuity of the organs, and thus coincides with what is called *stricto sensu* ‘radical moisture’) is a product of the further transformation of the third moisture, and the final result of the third digestion, or whether it is instead something present from birth (*a principio nativitatis*). It would, in that case, originate from the paternal semen (*cuius principium est ex spermate*), as Avicenna wrote. Since the sperm itself originates from the (primary) humours, the moisture derived from it would come both before and after the secondary humours (and this, in turn, raises the question of whether it is actually possible to restore, through nutrition, this original moist nucleus). The same classification of (non-superfluous) secondary humours or humidities is proposed again when Avicenna discusses the different types of fever in Book IV of the *Canon*.³⁴ Here Avicenna distinguishes:

³⁴ AVICENNA 1507, *Canon medicinae*, IV, fen 1, tract. 3, c. 1, f. 413va-b: “Iam scivisti quod in membris sunt humiditates diversarum specierum de quibus sunt humiditates preparate ad nutriendum et humectandum iuncturas. De illis ergo est illud quod est repositum in venis, et de illis est illud quod est spacium in membris sicut ros. Et istae sunt due divisiones. Et prima earum est materia febris putredinis, aut febris ebullitionis [...]. Et de illis sunt humiditates proximi temporis coagulationi, et sunt humiditates quae fiunt actu nutrimentum, scilicet attracte ad locum quod est permutatio eius quod est de eo resolutum, et fiunt additio in eo similis illi, verumtamen tempus cursus earum propinquum est, ergo sunt non coagulate. Et de eis sunt humiditates cum quibus continuantur partes membrorum similium partium a principio creationis et per ipsarum destructionem perveniunt ad separationem.”

1. the moisture contained in veins,
2. the moisture located in the interstitial spaces between the organs,
3. the moisture close to coagulation, which is nourishment *in actu*,
4. the moisture that ensures the continuity of organs.

However – as with Isaac Israeli’s *Liber febrium* – the correlation between the four types of moisture and the different types of fever is not entirely clear, at least in the Latin version of the *Canon*. At first, the fever that concerns the first moisture is defined as *febris putredinis* or *ebullitionis*: and putrid fevers, as noted above, are traditionally considered to be those that attack the primary humours. But Avicenna seems to be referring here in a clear way to the first ‘division’ of the secondary humours. Immediately afterwards, then, Avicenna introduces a tripartition of ‘hectic’ fevers, which at first glance seems ill-suited to the quadripartition of secondary humours:

Verum dum ipsa permanet finiando humiditates que sunt in digestionem prima [McVaugh: in divisione prima]³⁵ in membris, et proprie cordis, sicut finit candela oleum infusum in lucerna, tunc est gradus primus appropriatus nomine generis quod est ethica, et grece ecteticos cum non habeat in speciebus suis nomen. Et cum finit humiditates quae sunt divisionis prime et incipit resolvere humiditates que sunt divisionis secunde et finire eas sicut finit flamma oleum evacuatam in lucerna, et incipit finire imbibitum in corpus lichinii erit gradus secundus [...]. Cum ergo finiuntur istae et incipit finire humiditates quae sunt divisionis tertiae sicut incipit flamma adurere corpus lichinii et humiditates eius radicales est egritudo gradus tertii [...].³⁶

³⁵ One might indeed be tempted to read with McVaugh *in divisione prima* instead of *in digestionem prima*, on the basis of what is found in other editions of the *Canon* (which bear *divisionis prime membrorum*), and by analogy with the two occurrences of *divisio* to be found in the immediately following lines of this quotation. See McVAUGH 1974, 267, n. 20. In this way, however, the *divisiones* would in no way correspond to those set out at the beginning of the same chapter 1 of treatise 3 of *Canon* IV.1, which we read in the previous passage.

³⁶ AVICENNA 1507, *Canon medicinae*, IV, fen 1, tract. 3, c. 1, f. 413vb.

It is probable that Avicenna is referring here to the three successive stages of ‘digestion’ of nourishment *in the organs* (starting with the action of the heart): i.e. to the last three secondary humidities, leaving aside the moisture contained in the veins, whose febrile pathology – insofar as it still essentially concerns the blood – would fall precisely into the class of putrid fevers. In short, following Isaac Israeli, the first *digestio* here would not be the first in absolute terms, the one that takes place in the stomach. Rather it would be the first of the stages of the third digestion that begins to affect the organs, thus – to further increase the difficulty of this Latin text passage – the second of the four stages previously individuated within the third digestion itself³⁷. These three stages correspond, then, to three degrees – progressively more serious – of ‘hectica’ fever, considered as a *genus* in itself (*nomine generis*).³⁸ The first of these degrees, which is the least serious, is compared by Avicenna to the consumption of the oil poured into an oil lamp. The second degree is likened to the consumption of the oil soaking the wick itself. The third – the fatal one – corresponds to the desiccation of the moisture that holds the fibres of the wick together, ensuring its continuity.³⁹ The image of the dried wick is already to be found, as we have seen, in Galen’s *De differentiis februm*, but Avicenna makes a substantial transformation of the metaphor of the oil lamp: the radical moisture, or rather the *humiditates radicales* in the plural, according to the lexicon of the Latin tradition of the *Canon*, is/are made to correspond to the intrinsic moisture of the wick, and not to that provided by the oil that feeds the oil lamp and that impregnates the wick itself.

37 This seems to me to be the interpretation of Hall, ‘Life, Death and the Radical Moisture’, in particular at 4–5.

38 McVAUGH 1974, 267, n. 20 reads and transcribes *nomine granis*, instead of *nomine generis*.

39 See AVICENNA 1507, *Canon medicinae*, IV, fen 1, tract. 3, c. 1, f. 413vb: “Et similitudo humiditatum primarum est oleum lucernae infusum in lucerna, et similitudo secundarum est oleum imbibitum in corpore lychinii. Et similitudo tertiae humiditatis est humiditas qua continuantur partes cotti de quo factus est lychinius.”

The relationship between secondary humours and the distinctive category of febrile illnesses designated as ‘hectic’ fevers is substantiated by Avicenna on the basis of a more traditional tenet, namely that deterioration and death can be reduced to two fundamental factors: the *resolutio* of the moisture *ex qua creati sumus* (which is intrinsic to our being, not least due to its spermatic origin), and the alteration, corruption, or decay of the primary humours. The desiccation of the vital humours can, in turn, be brought about in two distinctive ways: either by intrinsic heat (as a consequence of the ageing process) or by externally induced heat (as is the case with ‘habitual’ fevers).⁴⁰

4.

Despite the opacity regarding the origin of radical moisture (which, as mentioned, seems to be due as much to the semen as to the completion of the process of third digestion), the Avicennian arrangement of ‘non-superfluous’ secondary moistures is the one destined to prevail in the Latin West. The Avicennian approach has, in fact, the dual advantage of framing the subject of moistures in a broader context, not limited to the consideration of a particular class of fevers, while at the same time consolidating the link between ‘hectic’ fevers and digestion in a more coherent way. In Constantine

⁴⁰ See AVICENNA 1507, *Canon medicinae*, I, fen 3, doct. 3, c. 1 (“De causis sanitatis et egritudinis et necessitatis mortis”), ff. 52vb–53ra. But in a symmetrical way, an excess of moisture from outside also compromises or extinguishes natural heat, just as – to stay with the oil lamp metaphor – adding water to oil risks extinguishing the flame: f. 53ra: “Flamma namque duas habet humiditates, aquam et oleum: una quarum consistit, et altera extinguitur. Similiter calor innatus in humiditate consistit naturali et ab augmento extranee extinguitur, que provenit ex debilitate digerendi et est sicut aqua humiditas flamme, et cum siccitas ad complementum accidit calor innatus extinguitur et mors subsequitur naturalis. Corpus autem non permanet tempore quo perdurat nisi propterea quod ipsius innata humiditas prima resolutioni resistit caloris mundani et caloris sui corporis in natura sui.”

Africanus' *Pantegni* – a translation/reworking of the *Kitāb al-malikī* or *Liber regalis* of Haly Abbas (‘Alī ibn ‘Abbās al-Mağūsī), the circulation of which in the Latin world preceded that of the *Canon* (translated by Gerard of Cremona in the 12th century) – one does indeed find a terminological and conceptual oscillation between *febris ethica* and *phthisis*. In the theoretical part of the work, *ethica* serves as the genus that encompasses both aging and febrile pathology (referred to as *phthisis*); in the practical part, the terminology is reversed, with *phthisis* instead constituting the general term, of which aging and *febris ethica* are the main subdivisions. Nevertheless, the *Pantegni* played an important role in introducing into Latin vocabulary the names of the various forms of secondary moisture (names that are partially found in the *Canon*, but which Avicenna seems not to give much weight). And yet, even in the *Pantegni*, we find a certain amount of fluctuation. In its *pars practica* (III, c. 18), the humidities progressively consumed by the different stages of *febris ethica* differ as follows:⁴¹

[humor] rosaceus	moisture in blood vessels
cambium	moisture present in the recesses of the organs, before completion of the third digestion
gluten	substantial moisture that holds and guards the limbs/spermatic moisture

However, in the discussion conducted in the *pars theorica* (VIII, c. 7), and in particular in the description of the second species of *febris ethica* (the *con-*

⁴¹ CONSTANTINUS AFRICANUS 1515, *Pantegni*, II (*Practica*), f. 88rb: “Unum est in vasis sanguineis et in venis humorum existens, et dicitur rosaceus; secundum est humiditas in membrorum concavitate in quibus nondum natura perfecit tertiam digestionem, et dicitur cambium; tertium est substantialis humiditas qua reguntur et custodiuntur membra que in vasis sanguineis existit, et dicitur gluten sive humiditas spermatica.”

sumptive one), *ros* or *aeris umbra* seems rather to designate the moisture present in soft flesh.⁴² It will be recalled that *ros* is instead mainly used by Avicenna to designate the moisture present in the interstitial spaces between organs.

Averroes, whose role in the elaboration of the doctrine of radical moisture (*ruṭūba aṣlīya*) was first highlighted by Paola Carusi, helps us understand the way in which the link between humidity, heat and food was taken up and discussed by the Latin scholastics (physicians, philosophers and theologians).⁴³ Perhaps Averroes' most important contribution was to address a question that had remained largely in the background throughout the previous tradition: why, beyond what had been handed down by the Greek philosophical and medical tradition, do living beings need moisture? The answer, according to Averroes, can be deduced from a fundamental difference: whereas inanimate bodies are produced directly from the four elements (and the interaction between the four fundamental qualities), living beings require an intermediary that allows the assimilation and transformation of the elements into the tissues and organs that make up the living being. Indeed, the difference between inanimate and animate bodies comes down ultimately to the fact that anything animate always presupposes the presence of organs (as stated in the Aristotelian definition of the soul as the act of an *organic* body that possesses life in potency).

But differentiating the organs means that the external elements and qualities cannot be distributed homogeneously in the body. Hence the need for an intermediary that allows the differentiated assimilation of substances taken in from outside. This intermediary is moisture: the food, properly 'digested', is transformed into a liquid substance (blood) which passes through

⁴² CONSTANTINUS AFRICANUS 1515, *Pantegni*, I (*Theorica*), f. 37vb.

⁴³ CARUSI 2014.

all the limbs; this moisture mixes with the moisture already present in the organs themselves, and it is this mixing that, under the action of heat, causes the food to be perfectly assimilated into each of the organs and perfectly integrated into their form and function, becoming, for example, flesh in flesh and bone in bone.⁴⁴ The theoretical framework of the question of moisture is thus radically altered, and it is no coincidence that Averroes is consequently forced to abandon at least two of the basic tenets of the Avicennian synthesis: 1. the idea of the spermatic origin of radical moisture – for Averroes it is the blood that allows the progressive assimilation of food in the different organs, and not a moisture derived from sperm; 2. the very use of the metaphor of the oil lamp. On this last point, in the process of assimilation, for Averroes it is not so much the intrinsic moisture of the wick that is at stake. Rather, it is the fact that the wick itself is immersed in oil, and that the complete mixing between what already belongs to the organs and what comes instead from outside, through nutrition, takes place in this moist environment.

In this way, Averroes makes a significant step forward in the reinterpretation of moisture as a vital principle. It is no longer a matter of relying on the traditional link between moisture and heat. Averroes, instead, gives a more technical explanation of how, from a rather simple and undifferentiated basic ‘alphabet’ (the four elements and the four fundamental qualities), the complexity of organic bodies, i.e. living bodies, can be achieved. Moisture is the basis of life not so much or not only because it acts as fuel for heat (innate or extrinsic, endogenous or exogenous), but also and above all because it is the ‘medium’ that allows each living being to develop and differentiate, assimilating and integrating in the most appropriate way all that it takes in through nutrition. To put it in another way, moisture is not only what is con-

⁴⁴ See in particular the passages from the *Colliget* and the *Epitome* to *De generatione et corruptione* translated into Italian by CARUSI 2014, esp. 69 and 72.

sumed, it is what enables every living being to profitably interact with the outside world.

As we have seen, the idea that radical or substantial moisture is a kind of glue for the simple organs was already well established in Avicenna. The same idea is further developed, in Latin Scholasticism, by Albertus Magnus. For Albertus, as is clearly stated in *De animalibus*, this adhesive function is what defines moisture in living bodies:

Colla autem corporum mixtorum est humidum: nec aliquid est quod contineat mixta in continuatione unius formae mixturae nisi humidum. Specialiter tamen humidum quod est colla mixtorum, est in animatorum corporibus.⁴⁵

The parts of the organs are held together by this glue just as the stones in a wall are held together by cement (“Continuum autem secundum collae rationem est colligatum sicut lapides in muro per caementum”).⁴⁶ However, Albertus points out that the term ‘glue’ is predicated by analogy, *per prius et posterius*, since moisture is actually threefold:

Et hoc est humidum triplex. Unum quidem imbibitum mixtis elementis et hoc praestat continuationem. Alterum autem est fluens per ipsa quod praestat molificationem. Et tertium est quod continue assimilatur eis, et hoc praestat nutrimentum.⁴⁷

Compared to his sources, Albert goes backwards, so to speak: he starts from the moisture that is properly ‘glue’, and that provides the continuity of the organs, and then goes back to the moisture that still flows in the organs them-

45 ALBERTUS MAGNUS 1920, *De animalibus*, XX, tract. 1, c. 9, 1298,9–12. On the importance of radical moisture in all living things, including plants, see PANARELLI 2020.

46 ALBERTUS MAGNUS 1920, *De animalibus*, XX, tract. 1, c. 9, 1299,10–11.

47 ALBERTUS MAGNUS 1920, *De animalibus*, XX, tract. 1, c. 9, 1298,13–16.

selves, spreading out into the pores and spongy parts (*in partium spongiositate et poris*) and ensuring their softness (*mollificatio*) or permeability. He then ends by focussing on the moisture that is continuously assimilated, and which acts as nourishment.

It is the function of the 'mollifying' moisture that deserves special attention here. If the organs of living beings were not made soft and permeable, they could not receive the input of the sensible forms coming from outside through nutrition and digestion.

5.

This brings us to the last author I wish to consider, namely Thomas Aquinas, whose position allows us to broaden the scope of this contribution from medicine and natural philosophy to the theological implications of the theme of radical and 'alimentary' moisture. Aquinas' theses, as we noted at the outset, are linked to the problem of the *veritas naturae humanae*, the truth of human nature: what is superfluous and incidental, in the bodily constitution of an individual, and what is instead essential? There are at least two aspects to this question. The first is theological, and it calls into question the constitution of the post-lapsarian nature of humankind: in what way did Adam's sin alter the physical constitution of the human species? The second is eschatological, insofar as it entails the destiny of humanity itself: if the resurrection of the flesh is an essential element of the Christian faith, what exactly of the flesh is destined to be restored, and in what way can the glorious body be considered identical, in a certain respect, to the earthly body? The entire philosophical tradition is radically opposed to any kind of continuity between the bodies of the dead and the resurrected. Aristotle already saw a

radical case of equivocation between the living and the dead body. It is impossible that what has become corrupt can be restored as numerically identical to what it was before. On the other hand, if this identity were completely denied or called into question, it would no longer even make sense to speak of 'resurrection' in the strict sense: the soul itself would find itself in glory, united to a body other than that with which it was united in earthly existence. If, however, man (and this is particularly true to Aquinas) is not simply his soul, but the union of soul and body, it would be difficult, if not impossible, for the *same* (numerically identical) man who had lived on earth to be resurrected.

And yet – as has already been noted – our bodies do change: our matter undergoes a whole series of quantitative changes due mainly (but not only) to the growth and assimilation of food. Should we then assume – to allude, with deliberate anachronism, to a famous expression – that we are somehow what we eat, or rather that there is something about our bodies that remains independent of all quantitative changes? That, in a nutshell, is what the 'truth of human nature' is about. The expression most likely dates back to Anselm of Aosta's *Cur Deus homo*, which asks whether mortality is part of the truth of human nature. In the 12th century, however, and in particular from the *Summa sententiarum* attributed to Odon of Lucca and the *Sentences* of Peter Lombard, the expression came to designate that part of the human body which does not come from food. As such it, therefore, constitutes an essential substratum that persists independently of the variability determined by the assimilation of food⁴⁸. The *veritas humanae naturae* is thus – to use the words of Chiara Crisciani and Giovanna Ferrari – "il nucleo identificativo dell'individuale identità corporea (nucleo che per primo è animato dall'anima; e che è la

⁴⁸ See in this regard PRINCIPE 1990 and PRINCIPE 1991; REYNOLDS 1999 (esp. chapters 2 and, on Aquinas, 13 and 14); CRISCIANI, FERRARI 2010, esp. 345–351; FITZPATRICK 2017.

materia destinata a risorgere)."⁴⁹ There are three main places where Thomas Aquinas addresses the question of the exact identification of the *veritas humanae naturae*, i.e. what material component is actually part of the human essence. Two belong to the early *Commentary on the Sentences*, completed before Aquinas became a teacher, i.e. before March 1256 (II, dist. 30, q. 2, art. 1, and IV, dist. 44, q. 1, art. 2, qc. 4, to which the later *quaestiuncula* 5 can also be added). The other coincides with q. 3 of *Quodlibet VIII*, disputed in the Lenten Session of 1257.⁵⁰ Not least because of their chronological proximity, these three texts present a coherent doctrine, without conspicuous discrepancies or deviations, even if Aquinas' personal adherence to one of the theses is sometimes more explicit and sometimes more concealed.

The first of these places, taken from the *Commentary* on Book II of the *Sentences*, concerns the transmission of human nature from Adam. As we have already noted, it is precisely in this context that Peter Lombard uses the expression *veritas humanae naturae*, thus giving it the technical value that it then acquires among all commentators.⁵¹ The starting point of the discussion, for Peter (cap. 14), is the Augustinian thesis that the whole of humanity was contained in Adam. Some might object that Adam's body clearly did not contain the same flesh that would later belong to humankind in its development. Peter Lombard responds to this objection in a way that is, at first sight, surprising. Instead of invoking a formal continuity of humanity from Adam, he actually defends the presence *materialiter et causaliter* in Adam of everything that would later be *naturally* (*naturaliter*) carried forward in all human bodies.

⁴⁹ CRISCIANI, FERRARI 2010, 337.

⁵⁰ For the respective reference editions see: THOMAS DE AQUINO 1929, *Scriptum super libros Sententiarum*, II, dist. 30, q. 2, art. 1, 776–787; THOMAS DE AQUINO 1858, *Commentum in quartum librum Sententiarum*, IV, dist. 44, q. 1, art. 2, qc. 4, 1076 and IV, dist. 44, q. 1, art. 2, qc. 5, 1078–1080; THOMAS DE AQUINO 1996, vol. 1, *Quaestiones de quolibet*, Quodl. VIII, q. 3, 60–65.

⁵¹ PETRUS LOMBARDUS 1971, *Sententiae*, II, dist. 30, c. 14–15, 503–505.

This material component is a kind of nucleus that, transmitted by the first parent, grows and multiplies in each human individual without any contribution from the food ingested. The propagation of humankind therefore consists in the transmission of a small amount of Adam's substance (*modicum de massa substantiae eius*), which develops autonomously in each of the descendants without the addition of any external component; part of this transmitted core in turn separates in the descendants to give life to subsequent bodies, and so on until the end of humankind. One might ask why Peter Lombard is so adamant that the food consumed by each human individual is not part of the essential bodily component of humanity. There are two reasons. One is scriptural, and is related to *Matthew* 15:17, which in the *Vulgate* reads: "Omne quod intrat in os, in ventrem vadit et in secessum emittitur" ("everything that enters the mouth goes into the abdomen, then is expelled through the secret places"). The second – according to Peter – is a rational argument: children who die prematurely are resurrected with the stature and size they would have had if they had lived to the age of thirty. But how can that same small amount of substance be expected to grow so large if it is not given the ability to grow and multiply on its own? Peter admits, of course, that the food ingested is transformed into flesh and blood, but he denies that it becomes part of the "truth of human nature" which comes from the ancestors of humankind. It is therefore flesh that, at the moment of resurrection, will be dropped as superfluous.

This is the starting point of the first question that Aquinas devotes to the problem, whose precise title is: "Utrum alimentum transeat in veritatem humanae naturae". The comparison with Peter Lombard's text, however, is mediated on the one hand by the tradition of existing commentaries (and in particular, as we shall see, by the positions of the Franciscans), and on the

other hand by Aquinas' awareness of another doctrinal line, that of Aristotle's *De generatione et corruptione*, and of the Averroist interpretation of this text. There are thus, according to Aquinas, three different ways of approaching the question and this tripartition is constant in all three places where Aquinas addresses the question of the *veritas humanae naturae* mentioned above.

The first position is precisely that of Peter Lombard: the *veritas* of each human being is contained in what has been transmitted by the parents (fundamentally by the father). This core is preserved intact in each individual and develops (through self-multiplication) to that full stage of growth which will then be restored in the resurrected body. Food ingested during life in no way becomes part of this essential core, and, as we have just seen, will be discarded at the moment of resurrection. The function of food during earthly life is, therefore, essentially to nourish the natural heat of the body, without affecting the matter that constitutes its *veritas*. The comparison is made to lead that is added in the process of liquefying gold, not so that the lead mixes with the gold, but so that lead, and not gold, is consumed in the process. Aquinas has no hesitation in dismissing this thesis as irrational, for two distinct reasons. First, it is incomprehensible that the same nucleus of matter could develop or increase only 'by multiplying itself'. Accretion implies either that the same quantity of matter previously contained in smaller dimensions is found in larger dimensions, and this is what happens in any process of rarefaction. Alternatively, the amount of matter itself increases as the dimensions increase, and this can only happen either through the creation of new matter or through the assimilation of matter originally belonging to another body. It is clear, however, that the human body does not develop or increase by rarefaction, nor by God's creation of new matter: all of the natural processes that oc-

cur in our world are merely transforming the matter originally created by God. Therefore, there seems to be no alternative but to admit that the growth of the human body takes place through the assimilation of matter that previously belonged to other bodies (food).

A second reason why Peter Lombard's thesis seems unreasonable has to do with the function of food itself. If the intake of food were not a natural end in itself, but a function of something potentially harmful to every living thing (i.e. to feed the natural heat that consumes the moisture proper to every living body), nature would be doing something against itself. If food were not really intended to be transformed into the living body, the transforming function of heat itself would be entirely superfluous. The strategy with which some try to defend Peter Lombard's position, by assuming, for example, that the multiplication of man's essential matter is a miracle similar to the multiplication of the loaves and fishes, is likewise meaningless to Aquinas. First of all, it seems quite inappropriate to convert purely natural processes into miracles ("Sed istud expressam continet falsitatem, dum opus naturae in miraculum convertitur").⁵² Then, even in the case of the miracle just mentioned, it can be assumed that the matter of the multiplied loaves and fishes was actually obtained by converting or transmuting the matter of other bodies. In short, for Aquinas the transformation of food into living flesh is an entirely natural operation, delegated by God to nature, and there is no need to resort to miracles for it ("Quod autem naturae possibile est, operationi naturae a Deo committitur, qui unicuique dat perfectionem secundum quod capax est; unde non oportet ad miraculum confugere").⁵³

52 THOMAS DE AQUINO 1929, *Scriptum super libros Sententiarum*, II, dist. 30, q. 2, art. 1, resp., 780.

53 THOMAS DE AQUINO 1929, *Scriptum super libros Sententiarum*, II, dist. 30, q. 2, art. 1, resp., 780.

Others have tried to defend the same thesis by questioning the presence in the human body of a celestial or quintessential component, capable of multiplying itself, just as sunlight multiplies itself in the air, without any external contribution. But even such an invention (*adinventio*) is false for Aquinas. After all, the presence of a quintessential component in the human body is purely virtual, not physical, meaning that it is reduced to the influence of celestial bodies on human generation, without anything 'ethereal' or celestial actually being physically present in human bodies. Moreover, the propagation of light does not involve any material multiplication, since light is not – for Aquinas and most masters of the same period – a body: light propagates by the propagation of form, humans propagate by the propagation of both form and matter. Finally, others have tried to invent another kind of argument to 'save' the thesis of the *Sentences*: prime matter, taken in itself, is completely devoid of all form and all quantity, and is therefore equally capable of receiving all form and all quantity. Therefore, however small the portion of prime matter in a body may be, it remains such that it can receive any quantity – so that from a single grain of millet one could make the whole universe.

This argument is inadmissible, for Aquinas, firstly because it assimilates prime matter to a geometric point, imagining that bodies can be obtained from it by extension. But the indivisibility of prime matter consists in the negation of any quantity, whereas the geometric point is the principle of (continuous) quantity. Therefore, when prime matter takes on a quantity, this certainly does not happen by extension (since extension itself would presuppose the existence of a quantitative component), but simply because it receives, by determining itself, a quantitative dimension. Secondly, it cannot be imagined that prime matter – insofar as it is still devoid of quantity – can be in potency towards any quantity, but only towards the determined quantity that per-

tains to the natural form that can be inherent in matter itself. One cannot in fact presuppose the existence of a passive potency that is not commensurate with that of the corresponding active potency (the natural forms). This makes any process of multiplication or increase to infinity impossible. In this way, the process of accretion would, in any case, again coincide with a kind of rarefaction. Most importantly, when we speak of the matter of a given thing (in this case, the human body), we are no longer referring to matter taken in an absolute sense: the matter proper to a body is already quantified, that is to say, it is already endowed with the indeterminate dimensions to which we referred at the outset. Such a matter is not capable of infinite multiplication (up to and including the entire universe), but only within the limits imposed by its own quantitative dimension. Aquinas' conclusion is thus unequivocal: the thesis set forth in Peter Lombard's *Sentences* is false, and so are the arguments with which Peter had tried to defend it.

The second main thesis discussed by Aquinas is that of those who admit that there is a kind of unalterable core in the human body, but at the same time claim that the intake of food serves not only to nourish natural heat: the assimilated food, on the contrary, contributes to increasing the quantity of body matter until it reaches its optimal size. The immutable part is thus mixed with that which comes from outside, just as a greater quantity of (watered-down!) wine can be obtained by adding water to it, without the original wine itself undergoing any quantitative change. In this way, what is produced by the ingestion of food does not remain entirely outside the truth of human nature (as in the first thesis), but contributes to it only in a secondary way, as an addition necessary to reach the due quantity. Thus, at the moment of resurrection, not all matter produced by food will be deposited (as the advocates of the first thesis wanted), but only a part of it: instead, the part

that is needed to complete the quantity of the body itself will remain in the resurrected body. Following Averroes (*Commentarium medium in Aristotelis De generatione et corruptione*, I, 38), Aquinas ascribes this thesis to Alexander of Aphrodisias, but it is in fact a compromise solution – as the example (unfortunate!) of watered-down wine clearly shows – taken up by some Franciscan masters, which Aquinas may well have had in mind. Even this position, however, is not correct for the Dominican Master: if one identifies the inalienable and unalterable part of the matter of the human body with the so-called ‘radical moisture’, which is transmitted in the generative process and spreads throughout the body of the new individual, ensuring its cohesion, one would have to explain why the natural heat (which acts as an instrument of the vegetative soul) can consume the moisture produced by the assimilated food (the so-called ‘nutrimental moisture’) without affecting the former, the ‘radical’. Moreover, according to this thesis, the intake of food would not be aimed at restoring what has been lost in the life processes, but only (inexplicably) at increasing the amount of matter. It is easy to see, however, that the assimilation of something external always changes the nature of the original substance – as is the case with watered-down wine. Even in the case of human nutrition, we can see how the nourished body is somehow changed by the food it takes in: “[...] sic etiam videmus quod ex humido nutrimentali adveniente immutatur corpus nutritum ut assequatur in aliquo conditiones ciborum ex quibus nutritur.”⁵⁴

In a certain sense, then, for Aquinas we are what we eat or we become what we eat. It is therefore obvious and inevitable that the food ingested, once assimilated, mixes with pre-existing flesh. This mixture does not allow any distinction to be maintained between the unchangeable part of the hu-

⁵⁴ THOMAS DE AQUINO 1929, *Scriptum super libros Sententiarum*, II, dist. 30, q. 2, art. 1, resp., 783.

man bodily nature (radical moisture) and an adventitious part (nutrimental moisture), or between a part that expresses the truth of human nature in a primary and principal way and a part that expresses it in a secondary and integrative way. To stay with the example of wine: once wine has been diluted, it is illusory to be able to maintain a distinction between the original and pure part of the wine and the added water. What is obtained is only an indistinguishable mixture of one and the other, with an intermediate quality: “totum est habens eam [i.e. the virtue of wine] mediocriter”⁵⁵; very *mediocriter*, we might add. The theoretical assumptions of this second position are clearly set out by Aquinas: from a philosophical point of view, the distinction between flesh according to species and flesh according to matter, and from a medical point of view, the aforementioned distinction between radical moisture and nutrimental moisture. But neither distinction – as Aquinas points out in his responses to the arguments (*ad 2^{um}* and *ad 3^{um}*) – actually supports the thesis in question. The first because, in strictly Aristotelian terms, the distinction itself does not hold. The flesh ‘according to matter’ is in fact not really distinct from the flesh ‘according to species’, but the same numerically identical flesh is said to be ‘according to species’ insofar as it participates in the form and properties that define the species, and ‘according to matter’ insofar as it consists precisely of matter.

As for the ‘medical’ distinction between the radical and the nutrimental moisture, for Aquinas this is not to be understood in the sense that the two components remain separate and distinct throughout life (without the latter adding to and somehow restoring the former). Rather, the ‘radical’ moisture is so called because it is what originally acts in each individual as a substratum for the natural heat. The nutrimental moisture, on the other hand, only

⁵⁵ THOMAS DE AQUINO 1929, *Scriptum super libros Sententiarum*, II, dist. 30, q. 2, art. 1, resp., 784.

participates in the species (i.e.: it is transformed, for example, into the flesh, blood and organs *proper to humans*, although it has a completely different origin) insofar as it merges with the radical moisture already present. The radical moisture is, therefore, called 'radical' because it is the root (*radix*) of all that is subsequently added by the transformation of food. But this is not the reason why, at the end of the final digestion (the one by which the food is completely assimilated and integrated into the living body), the two humids remain distinct. On the contrary, there is only one humidity, endowed with the same property so it can participate in the nature of the species and to be consumed jointly. Similarly, the consumption of radical moisture does not consist only in the progressive erosion of the original component, but in the consumption (by heat) of all the mixed moisture produced during life, which at a certain point can no longer be adequately restored and thus maintain the *virtus* of the species (in the same way that, when a hand is forcibly amputated, it cannot be restored by nutrition because the *virtus* of the species that was in that organ is now missing).

The third position presented by Aquinas is the one derived from Averroes' commentary on *De generatione*: there is nothing material in a body endowed with quantity that can be considered fixed or permanent. All that pertains to the matter of the body is therefore transitory, while what remains pertains to the form and the species. To use the same example offered by Aristotle in Book I of *De generatione* (1, 327b10–15), the transformation of food into flesh is similar to the burning of wood: the form of the fire remains, while the wood that feeds it is constantly changing, allowing the species of the fire to be 'saved'. In the same way, that which belongs to the species and form of the flesh continues to exist in man throughout his existence, while that which receives this form or serves as a substrate for it is continually con-

sumed and just as continually restored until death. The difference with the first two positions is thus clear: there is no *signified* (i.e. quantitatively dimensioned) part of the matter of the human body that is exempt from change; instead, the only stable component is form. But in addition to this, another difference is immediately apparent: if according to the first point of view the food consumed does not become part of the truth of human nature at all, or, according to the second, only contributes to it in an accessory and complementary way, for the third point of view this barrier falls completely. Food becomes part, *simpliciter et primo*, of the truth of human nature. At the end of the assimilation process, the mixture is such that it takes on the ‘truth’ of the species as a whole, in an indistinct way. So, with all due respect to Peter Lombard and some contemporary theologians, even assimilated food is destined, within the limits of due quantity, to resurrect as part of us. And albeit with a cautionary formula, which actually makes little sense in the light of the reservations expressed earlier, Aquinas openly defends the third position: “Et huic positioni inter omnes magis consentio sine praeiudicio aliarum.”⁵⁶

6.

The other two texts mentioned above – as already noted – do not substantially alter this structure, adding only a few clarifications. Both in the *quaestiu-ncula* taken from the Commentary on Book IV of the *Sentences* and in q. 3 of *Quodlibet VIII*, for example, Aquinas traces back to Avicenna (the metaphysical Avicenna, not the medical one) the specific meaning that *veritas* takes on in the expression *veritas humanae naturae*. The ‘truth’ of each thing is the property of its being; and the truth of human nature – what pertains most to its be-

⁵⁶ THOMAS DE AQUINO 1929, *Scriptum super libros Sententiarum*, II, dist. 30, q. 2, art. 1, resp., 785.

ing – depends on its form (just as ‘true’ gold is that which possesses the true form of gold, on which its own specific being depends). The reference to Avicenna reflects Aquinas’ great interest at that time in the metaphysics of the Persian philosopher (see his *De ente et essentia*). But this is obviously a purely conceptual overlap, since the 12th-century authors who first used the expression *veritas humanae naturae* certainly did not derive it from Avicenna’s *scientia divina*.

A discussion of the positions we already know follows in both texts. With regard to the second option, in the Commentary on Book IV of the *Sentences*, Aquinas not only makes explicit the full identification – proper to this thesis – between the truth of human nature and the radical moisture. He also explains that the contribution of food must be considered accessory with respect to the ‘truth of the nature’ of a given individual, but primary and essential with regard to whom descends from that individual. In fact, the advocates of this thesis maintain that the seed is the *superfluous* residue part (the *superfluum*) of food assimilation, so nutrimental moisture in the father becomes (transmitted by the seed) radical moisture in the son. Another important clarification is introduced – again in the Commentary on Book IV of the *Sentences* – regarding the third position. In fact – Aquinas explains partly correcting himself – the distinction between radical and nutrimental moisture must not be derived from the principle of generation, so that the moisture generated by the seed is considered to be ‘radical’, and the moisture produced by the food is considered ‘nutrimental’ (as in the second opinion). Rather the distinction between the two has to derive from the end of the generative process: radical moisture is, therefore, something which is perfectly integrated into the body starting from both the *virtus generativa* and the *virtus nutritiva*, that is, starting from both seed and food. Nutrimental moisture is, instead,

simply that which has yet to be perfectly assimilated, and, thus, has not yet reached its end, but is still carrying out its nutritive function (*in via nutriendi*).

In this way, Aquinas, in contrast to a widespread contemporary opinion, rejects any strict identification between the radical moisture and the component transmitted by the paternal seed. This is true, even if it must be recalled that in the Commentary on Book II, Aquinas himself had in any case considered radical moisture to be the primordial substratum of natural heat, and therefore the *radix* of the moisture brought by food. The example of fire and combustible wood is replaced by the more ‘political’ example of the city or state: the ‘matter’ of a city, that is to say the set of its citizens, is constantly changing, as those who die are replaced by others who fulfil the same function; but the form does not change, because the order and functions do not change. This ensures that, despite the natural alternation of generations, the city always remains numerically identical. Aquinas, however, seems to partially mitigate the difference between the second and third position by stressing that the ‘adventitious’ parts of the body, derived from food, do not belong as perfectly to the truth of the species as the ‘non-adventitious’ ones. Therefore, in resurrection, the original core will be restored in its entirety, even if it is mixed with what has been assimilated in life.

Regarding q. 3 of *Quodl. VIII* (*Utrum alimentum convertatur in veritatem humanae naturae*), having taken up the reference to Avicenna’s *Metaphysics*, Aquinas goes on to specify once again that the ‘truth’ of something pertains to its completion and fulfilment on the basis of its form, and not to what serves its individual preservation or improvement. For example, in the case of a tree, the trunk and fruit are essential, and belong to the truth of its nature, but not the leaves, which (for Aquinas) are somehow preordained to the preservation of the fruit. In the case of the human being, the truth of its

nature consists in that which belongs to the perfection of nature itself, participating fully in the form of the species, while excluding everything that serves to preserve or improve it. In presenting the first opinion, Aquinas introduces new objections. First, it is not well understood how an original nucleus can remain unaltered in the history of humankind, since every individual death seems to entail a loss of matter anyway; second (but this is really only a reformulation of an argument already encountered), no capacity for increase or multiplication can be attributed to matter except insofar as it is already endowed with quantitative dimensions. But since the supporters of the first thesis deny the acquisition of any new part of matter, they seem to understand the multiplication of matter as a mere process of rarefaction (and at this point in history, humankind should already be more rarefied than fire, as Aquinas observes, not without a hint of sarcasm). The third position is reformulated in even sharper terms: the human form is realised and perfected indifferently and equally (*indifferenter et aequaliter*) by what comes from parents and what comes from food, and both components equally consume and persist. They consume matter, but they persist as far as the species is concerned, as the example of the city clearly shows. In the human body, flesh, bones and other parts are constantly changing in terms of matter, but they persist in terms of species and form (with respect to place, figure and *virtus*). A human being remains a human being even if all his cells, as we would say today, die and are incessantly replaced. And here, as in the Commentary on Book II of the *Sentences*, Aquinas does not hide his preference: “Et hec opinio uidetur ceteris probabilior.”⁵⁷

57 THOMAS DE AQUINO 1996, vol. 1, *Quaestiones de quolibet*, Quodl. VIII, q. 3, 64,253.

In conclusion, there is little doubt that for Thomas Aquinas the ‘truth of human nature’ inextricably includes what we eat. Admittedly, the meaning of this discussion has little in common with the traditional German proverb (“Man ist was man ißt”) later borrowed by Feuerbach.⁵⁸ And yet one cannot fail to note the determination with which Aquinas rejects any attempt to separate an original core of human nature (at least as far as the body is concerned) from the contribution of the assimilated food. Indeed, he refuses to the point of admitting – as we have noted – that the body is transformed by adapting in some way to the conditions of the food that feeds it (“*immutatur corpus nutritum ut assequatur in aliquo conditiones ciborum ex quibus nutritur*”). It could be argued, however, that this conclusion is relative, since the ‘truth of human nature’ is in any case still subordinate to the specific form, which is what ultimately makes a human being ‘human’. In the end, a person is a person because she possesses a rational soul, not because of the matter that enters into the ‘truth’ of his nature. But even in this case, a clarification is necessary: for Aquinas, the intellectual and moral inclinations of the soul are strongly influenced by the complexion of the body.

Indeed – to come back to our point of departure, namely the question of the origin of nobility as posed by Dante – the degree of ‘nobility’ of the soul itself directly depends on the quality of bodily complexion. This is a thesis which, unsurprisingly, led to the condemnation of Aquinas and of Thomism by Bishop Tempier and Aquinas’ Franciscan opponents.⁵⁹ What we are, and even our natural disposition to do good and think great thoughts (our natural ‘nobility’), depends ultimately, according to Thomas, on the quantity and

58 In his own review of Moleschott’s *Physiologie der Nahrungsmittel* (1850) and later, more systematically, in *Das Geheimnis des Opfers oder Der Mensch ist was er ißt* (1862).

59 See PORRO 2016.

quality of the moisture we received as a dowry at birth, and on the moisture we are able to supplement through diet.⁶⁰

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⁶⁰ I have dealt with the relationship between the powers of the rational soul and bodily complexion elsewhere: ZUCCOLIN 2019.

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