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Does the Mind Suffer? Living Bodies, Brain, and Pain in Alfanus of Salerno's *Premnon Physicon* and in Constantine the African's *Pantegni*

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The 11th century translations *Premnon physicon* by Alfanus of Salerno and *Pantegni* by Constantine the African offered to the Latin West two systematic descriptions of the human bodily architecture and its functioning. Both works highlight the relationship between the material constitution and teleological principles at play in the living body. This paper explores the working of one of these principles, the 'animal power', and its principal organ, the brain, within the living body. In particular, it examines the account of pain within these systems, underscoring its relationship to sensation: pain is conceived as an affection of the soul, and as a physical-material change in the sense organ, which is connected with the brain in its activity.

Introduction

Following in part Aristotle and in part Plato, Galen understood sensation as an alteration. This alteration is provoked by either the conjoined action of an inner principle (the *pneuma*), the outer air and the object (in the case of sight) or the action of the outer object in the sense organ (in the case of the other senses).[1] However, to be properly sentient, the material alteration that occurs in the organs must be acknowledged by the soul.

Galen's account of sensation can be understood, at least partially, within a framework that describes the bodies of the living beings in an ascending material scale that begins with the elements and ends with the organs, in conjunction with different faculties that operate in the different bodily structures (Van der Eijk, 2014: 100–01). The notion of *pneuma* is crucial for the explanation of how these faculties operate in the body.[2]

This Galenic explanation and its Arabic reformulation were introduced in the Latin West before the reception of the Aristotelian corpus, the Avicennian writings, and even the Galenic writings themselves. Two Latin translations: the *Premnon physicon*, Alfanus of Salerno's translation from the Greek of Nemesius of Emesa's treatise *Peri physeos anthropou*, and the *Pantegni*, Constantine the African's translation from the Arabic of the medical encyclopaedia *Kitāb al-malakī* [*The Complete Art of Medicine*] by the Persian physician ʿAlī ibn al-ʿAbbās al-Maǧūsī were very significant for the transmission of this account.

While the scope and the original intellectual context of these works are disparate,[3] there are good reasons for examining these two translations together. Both were written in the second half of the 11th century in Southern Italy. Their translators probably had a close relationship (Glaze, 2019: 11): Constantine was the protégé of Alfanus, to whom he dedicated one of his other translations (Long, 2019: 345). To some extent, they use a similar terminology (Burnett, 1994: 110–11). As products of the same cultural milieu, they offered more or less systematic conception(s) of the living body and its relationship to the soul to the Latin West. This was to transform the realm of philosophy in the 12th century (Ricklin, 1998: 408–09). It has also been argued that Alfano of Salerno's and, above all, Constantine the African's translations represent a turning point in the conception of 'physica' ['the science of nature'] in the Latin West (Caiazzo, 2020: 1082). Therefore, in the following, I will be referring to the *Premnon physicon* and to the *Pantegni*, and not to the original texts that they are translations of.

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[1] For Galen's conception of sense perception in general, see Siegel (1970); for vision, see Ierodiakonou (2014).

[2] For the standard notion of *pneuma* and its role in the physical explanation of how the brain operates in the body, see Green (2003: 136); Singer (2020: 241–42).

[3] I will refer briefly to the relationship to their exemplars, especially in the case of the *Premnon physicon*, when introducing the texts.

Several works mention the elaboration of the 'theory' of *pneuma* and the associated 'ventricular theory of the brain' in Nemesius's *On the Nature of Man* (Dusenbury, 2020: 481; Green, 2003; Jordan, 1990: 52; Manzoni, 1998: 114–15; Parry, 2018: 39–40; Van der Eijk, 2014), in Al-Maǧūsī's *The Complete Art of Medicine* and in the *Pantegni* (Burnett, 1994: 103–04; Harvey, 1975: 13–21; Jacquart, 2013: 599–600; McKeon, 1961: 230; Rocca, 2012: 649–50). Sense perception as a topic has been treated less often, though it has gained some attention in the past decade: essays refer to the process of perception or to individual senses in the *Premnon physicon* or in the *Pantegni* (Guerrero Peral and Frutos González, 2013; Robinson, 2020: 27; Salmón, 1996: 169; Selent, 2018: 168–71; Wallis, 2014: 135–36). Nevertheless, as far as I know, there is still no study about how sensation and pain as related phenomena are understood in the framework of the living body and in the general arrangement of both works.

To contextualize the contribution of the *Premnon physicon* and the *Pantegni* on the conception of sensation and pain, I begin by briefly revisiting some current developments in the historical study of pain. To correctly deal with the phenomena of sensation and pain within the living body, I first present the general arrangement of each translation. The discussion of sensation is placed against the background of the account (or accounts) of the living body and its functioning. In this account, the brain and its psychic functions play a major role. The subject 'pain' is first explored in its relationship to sensation. In the case of the *Premnon physicon*, further considerations on pain also take into account its placement alongside the discussion of the emotions.

This paper intends to present the general outline of these two translations. To this end, my discussion closely follows the text. In the case of the *Pantegni* in particular, I have opted to order some of the original passages according to specific subjects. In rephrasing the different segments, I offer a commentated reading, while the original text and its arrangement within each work can be appreciated in the article's notes. For the sake of clarity and concision, I have translated only crucial passages.

Pain in Context

The *Premnon physicon* and Constantine the African's medical translations transformed the understanding of the human body and its relationship to the soul (Ricklin, 1998: 409–10). Likewise, Boquet and Nagy argue that a shift in the conception of human affectivity began with the reception of 'new ideas, in part from medicine and the newly rediscovered natural philosophy' in the 11th century. Affectivity started to be conceived as 'not only a spiritual and moral phenomenon, but also a bodily one' (2016: 24). Studies that focus on emotions, especially on pain, have drawn attention to former notions of the body-soul relationship. Of particular importance was Augustine's account of pain:

pain was felt through the body, but from the soul (see Cohen, 2000: 42). This complex understanding of pain was not followed by patristic and early medieval theologians, who tended to separate body and soul, placing 'sensory pain within the Christian soul, and thus within a theological framework of salvation and damnation' (Cohen, 2000: 43).

The suggested 'emergence of emotions' in Christian anthropology is connected to the theological turn to Passion and Incarnation (Boquet and Nagy, 2016: 45). Understanding the humanity of Christ entailed understanding how he experienced emotions. At the same time, Donna Trembinski has shown the deep influence of medical thought in the Scholastic theology of the first half of the 13th century (2012). Later in the same century, Aquinas and Bonaventure would try to answer how the soul (and which part of the soul) was affected by external bodily pain (Boon, 2019: 263). The distinction between physical and emotional pain and the interconnection between these two was also approached by the Franciscan master (263).

The latter distinction is significant, as is the notion that pain is not always considered an emotion. Fernando Salmón explains that, in all medical texts, from those circulating in the early Middle Ages to those written at the universities, emotions were viewed as promoting health or causing diseases (2018). Nevertheless, 'pleasure and pain were not considered emotions per se, but belonged to the experiential realm of the emotions. Furthermore, some emotions, like joy and sadness, would usually be accompanied by pleasure or pain—and vice versa' (2018: 40). The preferred medical expression for emotions was 'accidents of the soul', in contrast to 'passions of the soul'. This term, first introduced in the Latin West by the *Pantegni*, conveys the idea of emotions as bodily movements, not as external imprints on the soul (Cohen-Hanegbi, 2019: 131, 135; see also Boquet and Nagy, 2016: 31–32).

This brief contextualization shows that developments in the realm of medicine influenced theology and even piety. It also underscores the relevance of pain for defining the relationship between body and soul. Above all, it indicates the relevance of the textual context to clarify how pain was understood. The two latter aspects will be of importance in the following analysis of pain within the frame of the living body.

Premnon physicon

The Greek treatise *On the Nature of Man*, written by Nemesius, bishop of Emesa (now Homs, in Syria) at the end of the 4th century, was first translated into Latin by Alfanus of Salerno, probably between 1052 and 1056 (Chirico, 2003a: 21). Alfanus renamed it *Premnon physicon* [the '*stem of natural things*'] and added a prologue, explaining that the treatise was prepared as an introduction to the study of man for 'his prince' (Bylebyl, 1990: 34). This prologue and the omission of the name of the original author gives the impression that Alfanus was the writer of this work (Burnett, 2009: 75–76).

The following quotations are taken from Karl Burkhard's edition (Nemesius Emesenus, 1917), while the numeration of the chapters follows the original work as it appears (Nemesius, 2008; Nemesius Emesenus, 1987). For the interpretation of the Latin text, I have consulted these last works and the Italian translation by I. Chirico. (Alfanus I, 2011). All translations are my own.

In presenting the subject of human being, Nemesius's *On the Nature of Man* considers first the substances of which it is composed (soul, body, and the elements as the constituents of all bodies), then the powers that are responsible for its physiological and psychological functioning, and finally human acts (Dusenbury, 2020: 483). This third section includes chapters on destiny and providence. Apart from this overall structure, the treatise presents several modes in which the soul and its faculties can be divided, including, significantly, the stoic distinction between 'immanent' and 'expressed' reason (chapter 14), the differentiation between rational an irrational parts of the soul (chapters 16-17), and the partition of the powers of the soul into natural, vital, and animal (chapter 26).

Alfanus's version follows, on the whole, the original text, but exhibits some relevant modifications (see **Table 1**): the seven chapters on destiny and providence are completely omitted, chapters 14 and 15 are blended and the order of some chapters is altered (Verbeke and Moncho, 1975: LXXXVI–CXVII; Morani 1983/1985: 139; Chirico, 2003a: 13–14; 2003b: 6; Burkhard, 1917: V; Brown Wicher, 1986: 34). Notably, the chapters on respiration, the generative or seminal faculty, the nutritive faculty and pulsation are treated at the end of the treatise and not in the middle section along with the other bodily powers. These three subjects are mentioned as part of the 'non-rational part that does not obey reason' (chapter 22). The nutritive and generative faculties are specified here as 'natural' and pulsation as 'vital'.[4] Instead of treating these immediately afterwards, as Nemesius does, Alfanus skips to chapter 26 on the division of the faculties in animal, natural and vital. Of these three, only the psychic faculties involve choice.[5] Subsequently, Alfanus examines voluntary and involuntary movements. In Nemesius's original version, respiration, an operation partly consciously controlled,[6] is discussed after that. Alfanus, however, omits this chapter and treats the human acts directly. In his translation, the

[4] Nemesius Emesenus (1917: 106), 22.1–2: 'Irrationale igitur oboediens rationi hoc modo se habet. Rationi vero non oboedientis est nutribile et generativum et pulsativum. Vocantur autem naturale nutribile et generativum, vitale autem pulsativum'.

[5] Nemesius Emesenus (1917: 106–107), 26.1–4: 'Dividunt vero etiam aliter virtutes animalis et alias quidem dicunt animales, alias autem naturales, alias vero vitales. Animales quidem voluntariae, naturales vero et vitales sunt involuntariae … Naturales vero et vitales non sunt in nobis, sed volentibus atque nolentibus naturales virtutes fiunt ut nutribilis et augmentativa et generativa, quae sunt naturales, et pulsativa, quae est vitalis'.

[6] For respiration as being 'within our power' as well as not 'within our power' and the place of this chapter in Nemesius's original work, see Dusenbury (2020: 493).

four physiological involuntary functions (respiration, the generative or seminal faculty, the nutritive faculty and pulsation) are examined at the end. This novel arrangement, as well as the omitted chapters, indicate that the criteria of 'choice' and 'consciousness' play a different, more relevant role in Alfanus's version than in the original.[7]

	On the Nature of Man		***Premnon physicon***
1	On the nature of man	(1)	Premnon physicon
2	On the soul	(2)	De anima
3	On the union of soul and body	(3)	De unione animae et corporis
4	On the body	(4)	De corpore
5	On the elements	(5)	De elementis
6	On imagination	(6)	De phantastica
7	On sight	(7)	De visu
8	On touch	(8)	De tactu
9	On taste	(9)	De gustu
10	On hearing	(10)	De auditu
11	On smell	(11)	De odoratu
12	On thought	(12)	De phantastica
13	On memory	(13)	De memoria
14	On immanent and expressed reason	(14)	De occulta et manifesta occasione
15	Another division of the soul		
16	On the non-rational part or kind of the soul, which is also called the affective and appetitive	(16)	De irrationali animae parte quae et passibilis et appetibilis nominatur
17	On the desirous part	(17)	De desiderativo
18	On pleasures	(18)	De delectationibus
19	On distress	(19)	De afflictione
20	On anger	(20)	De ira
21	On fear	(21)	De timore
22	On the non-rational element that is not capable of obeying reason	(22)	De irrationali non oboedienti rationi

[7] Irene Chirico (2011: XXXI) postulates that this differing chapter order is due to a mechanical mistake within the manuscript tradition of *Premnon physicon*. There is, however, no evidence for this, and it has been argued that at least the omissions could have been intentional. See Verbeke and Moncho (1975: LXXXVI–LXXXVII).

(Contd.)

	On the Nature of Man		*Premnon physicon*
23	On the nutritive faculty		
24	On pulsation		
25	On the generative or seminal faculty		
26	Another division of the powers controlling living beings	(26)	Alia divisio virtutum disponentium animal
27	On movement according to impulse or choice, which belongs to the appetitive part	(27)	De motione ad placitum vel secundum voluntatem quae pertinet ad appetibile
28	On respiration		
29	On the intentional and unintentional	(29)	De voluntario et involuntario
30	On the unintentional	(30)	De involuntario
31	On the unintentional through ignorance	(31)	De involuntario per ignorantiam
32	On the intentional	(32)	De voluntario
33	On choice	(33)	De praeelectione
34	About what things do we deliberate?	(34)	De quibus consulimus
35	On fate		
36	On what is fated through the stars		
37	On those who say that choice of actions is up to us		
38	On Plato's account of fate		
39	On what is up to us, or on autonomy	(39)	De eo quod in nobis hoc est de libero arbitrio
40	Concerning what things are up to us	(40)	De his quae sunt in nobis
41	For what reason were we born autonomous?	(41)	Propter quam causam liberi arbitrii facti sumus
42	On providence		
43	About what matters there is providence		
		(28)	De anhelitu
		(25)	De generativo vel seminali
		(23)	De nutribili
		(24)	De pulsibus

Table 1: Order of the chapters in *On the Nature of Man* (according Nemesius, 2008) and in *Premnon physicon*. Table prepared with the help of Claudio Gutiérrez Marfull.

The central section of *Premnon physicon* (and the original text) examines how the union of body and soul is achieved through the relationship between faculties or powers of the soul and bodily organs (Dusenbury, 2020: 485–86). The body is presented as an instrument of the soul. Accordingly, the bodily structure allows the actions of the powers of the soul, so that each power operates upon a specific organ. The first powers to be treated are fantasy, intelligence and memory.[8] They are the subject of chapters 6 to 13. The power of fantasy has the following instruments: 'the front cavities of the brain and the animal spirit that is in them, and the nerves, through which also pours the animal spirit, and the make-up of the senses'.[9] Those of the 'knowing virtue' ['*virtus disnocibilis*'] are 'the middle cavity of the brain and the animal spirit that is in it'.[10] The instruments of memory are 'the posterior cavity of the brain … and also the animal spirit that is in it'.[11] The animal virtues thus have a specific location in the brain. For them to operate, the 'animal spirit' is needed, which is in every cavity.

The interaction between these faculties is clearly stated in the chapter on memory (13): 'The soul grasps sensible things through the sense [faculty], intelligible things through the intellect and the figures of the perceived things and the known things are preserved in memory'.[12] Their interaction is described as an active process: 'The fantastic [virtue] brings to the discernment the things that appear to the senses. The discernment or reason receives and judges them, and then transmits them to memory'.[13] As already described, these faculties are thought to operate in specific parts of the brain, the cavities or ventricles. These psychological abilities are thus connected to the body. Furthermore, they are dependent on the body to perform adequately. Lesions that affect each brain cavity prevent their correct functioning: if the frontal cavities are damaged, only sensation is impaired; if the middle cavity, only reason; while injuries in

[8] See Nemesius Emesenus (1917: 72), 5.48–50: 'Corpus igitur animae instrumentum existens animalibus virtutibus distribuitur. His namque habile congruumque est compositum, ut nulla virtus animae impediretur a corpore. Unaquaeque igitur animalis virtus propria membra corporis ad operandum elegit, ut procedens sermo docebit … Dividuntur autem virtutes animae in phantasticam, id est imaginabilem, et intellegibilem et memorialem'. Alfanus is not consistent in his vocabulary: the terms *fantasia* and *imaginatio* are used as synonyms, as are *ratio* and *intellectus*. In a similar manner, *sensus* encompasses the general ability to sense, each sense faculty and the sense organs.

[9] Nemesius Emesenus (1917: 73), 6.4: '[Instrumenta vero eius sunt] anteriores cerebri ventres et animalis spiritus, qui in ipsis est, et nervi, qui sunt ex ipsis rorantes animalem spiritum et compositio sensuum'.

[10] Nemesius Emesenus (1917: 87), 12.3: '[Huius vero instrumentum est] medius venter cerebri et animalis spiritus, qui est in ipso'.

[11] Nemesius Emesenus (1917: 89), 13.7: '[Huius vero instrumenta sunt] posterior cerebri venter … et spiritus animalis, qui est in eo'.

[12] Nemesius Emesenus (1917: 87–88), 13.2: 'Anima namque sensibilia per sensus comprehendit. Intellegibilia vero per intellectum et figuras eorum, quae sensit, eorumque, quae cognovit, conservare memorare dicitur'. See Dusenbury (2020: 482).

[13] Nemesius Emesenus (1917: 89), 13.6: 'Phantasticum igitur tradit dinoscibili apparentia. Dinoscibile vero vel rationale accipiens et diiudicans transmittit illud memoriali'.

the posterior cavity affect memory.[14] These brain cavities are imagined as instruments rather than as dwelling places (Wright, 2018: 16).

The exposition on fantasy, the first of the animal powers, is the lengthiest: it encompasses the ability to sense and to imagine. Fantasy is an irrational power of the soul that operates through the senses. Among the several definitions of this faculty that are given, we find the Aristotelian idea that '*sensibilitas* is the power of the soul that receives sensible objects' and that the sense organs act as instruments to enable such reception.[15] The Galenic conception of sensation not as the alteration, but as the knowledge of such alteration, is also touched upon.[16] The *Premnon physicon* thus transmits (among others) both the Aristotelian passive notion of sensation and the Galenic active notion of it.

The *Premnon physicon* specifies as well that 'the senses are five, but the *sensibilitas* is only one, certainly that of the soul, which discerns through the affections of the senses, that occur in them'.[17] Although sensation is described here as a psychological process, in order to be able to sense something there must be a material correspondence between the specific sense (organ) and its object. In this manner, the sense of touch, considered as the earthiest of all the senses, feels things of an earthy nature. The other senses are also affected by the sensible object that has its same nature: sight by luminous, hearing by airy, and taste by humid objects.[18] Smell is responsive to vapors, of a nature between

[14] See Nemesius Emesenus (1917: 89–90), 13.8–10: 'Quia vero sensuum initia et radices anteriores cerebri ventres diximus esse, dinoscibilis vero medium et memorialis posteriorem, oportet nunc ostendere, si haec hoc modo se habeant, ne videamur sine ratione dicta credere. Satis vero est sufficiens demonstratio ab ipso actu membrorum assumpta. Anterioribus etenim ventribus quomodolibet laesis sensus praepediuntur et dinoscibile manet illaesum. Medio vero ventre patiente solo ratio interturbatur et sensus manent integri. Si vero et anteriores et medius venter perpessi fuerint, ratio simul cum sensibus aufertur, posteriori vero patiente memoria corrumpitur sensibus atque mente manentibus illaesis. Sciendum vero, quod non est nobis sermo nunc de motione ad placitum. Quod si cum anterioribus etiam et medius et posterior fuerint perpessi et sensibilitatem et rationem et memoriam simul corrumpunt; unde et sic, cum in toto periclitatur, deperditur animal. Patet autem hoc per multas alias passiones atque symptomata, sed maxime ex phrenesi'. For commentaries on this passage, see Parry (2018: 39–40); Van der Eijk (2008: 441).

[15] Nemesius Emesenus (1917: 74), 6.11: 'Sensibilitas est virtus animae susceptiva sensibilium; [sensus vero est instrumentum susceptionis sensibilium]'; 6.9: 'Vocatur autem frequenter sensibilitas sensus. Sed sensibilitas est receptio sensibilium. Sed videtur haec descriptio non esse ipsius sensibilitatis, sed operationum eius'.

[16] See Nemesius Emesenus (1917: 74), 6.8: 'Est autem sensibilitas non quidem permutatio, sed permutationis cognitio. Permutantur namque sensibilia, sed discernit permutationem sensibilitas'. See also Nemesius Emesenus (1917: 70–71), 5.25: 'Oportet enim, quod futurum est dolere, in permutatione fieri cum sensibilitate. Sed si unum esset elementum, non esset, in quod permutaretur. Non permutatum autem, sed manens in eodem, non doleret, et si esset sensibile. Necesse est autem, quod patitur, ab aliquo pati'.

[17] Nemesius Emesenus (1917: 73–74), 6.5: 'Sensus autem sunt quinque, sensibilitas vero una, animalis quidem, quae dinoscit per sensus passiones, quae fiunt in ipsis'.

[18] See Nemesius Emesenus (1917: 73–74), 6.5: 'Et magis quidem terreno magisque corporeo sensu, hoc est tactu, terream sentit naturam; clarissimo vero, hoc est visu, lucida, ut et aereo sensu sentit passiones aeris (aer enim est vocis essentia vel aeris ictus); spongioso vero et aquoso, hoc est gustu, humida suscipit. Unumquodque enim sensibilium per proprium dinosci sensum existit'.

air and water.[19] The treatise dedicates one chapter to each of the senses, in the following order: sight, touch, taste, hearing, smell. In these descriptions, the animal spirit is mentioned only when discussing sight (specifically when the Galenic conception of sight is revisited) and touch. The connection between the brain and sense organs is accomplished by the nerves, except in the case of smell, which is connected directly to the brain.

The ability to sense is understood as an activity that comes from the brain, the animal spirit and the nerves. Pain, as a phenomenon linked to sensation, is explored in the chapter on touch. Here, the *Premnon physicon* approaches the problem of how pain is felt—a problem also discussed by physicians and theologians in the Late Middle Ages (see Boon, 2019: 257–58):

> Consequently, how can [the sense of] touch belong to the whole body, if we say that the affections come from the anterior ventricles of the brain? It is clear that either the nerves are sent from the brain and are dispersed throughout the body, or the sensibility of [the sense of] touch occurs in it. But since often, when we are wounded in the foot by a thorn, the hairs of the head immediately stand on end, some believed that the affection (*passio*) or the sensibility of affection was sent to the brain and so sensation happened. If this reasoning were true, the cut part would never feel pain, but only the brain. It is therefore better to say that the nerve is the brain. Indeed, a certain part of the brain contains in all of it the animal spirit, just as a burning iron has fire. On that account, where a sensible nerve grows, that part receives the sensibility from it and becomes [itself] sensitive. Likewise, it is not wrong to refer to the origin of the organs, which is the brain, not the affection [itself], but a certain co-sensibility and the notification of the affection (Nemesius Emesenus, 1917: 82–83, 8.7–10).[20]

The *Premnon physicon* does not completely clarify where the affection or the sensation of touch is felt. However, it names their possible *loci*: the (wounded) member, the

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[19] See Nemesius Emesenus (1917: 74), 6.7: 'Sed quia vapor et odorum genus in medio naturae aeris et aquae est, – aeris etenim est, quod est grossius, aquae vero, quod tenuius … – propterea igitur quintus sensus, hoc est olfactus, a natura est inventus, ut nihil valentium ad notitiam accedere refugiat sensibilitatem'.

[20] 'Quomodo igitur totius corporis est tactus, si ab anterioribus ventribus cerebri dicimus esse sensibilitates? Manifestum, quod aut nervi sint transmissi a cerebro et dispersi in omne membrum corporis, aut tactus sensibilitas ei contingat. Sed quia multotiens a spina plagati pedem capitis confestim pilis frigescimus, noverunt quidam passionem vel passionis sensibilitatem ad cerebrum submitti et sic sentire. Sed si vera esset haec ratio, nequaquam doleret membrum incisum, sed cerebrum tantum. Melius est itaque dicere, quod nervus cerebrum sit. Etenim pars quaedam est cerebri per totum ipsum animalem habens spiritum, ut ignitum ferrum habet ignem. Ideoque ubi nervus sensibilis innatus fuerit, illa pars sensibilitatem percipiet ab ipso sensibilisque fiet. Similiter vero non erit inconveniens dicere ad principium membrorum, quod est cerebrum, non passionem, sed consensibilitatem quandam ac denuntiationem passionis'.

nerve, the brain. The brain has an irrefutable role in the experience of pain, although the brain alone does not account for the whole experience. The final solution settles for an interaction between bodily members and the brain. The body (or a bodily part) is rendered sensitive by the nerve, the nerve communicates to the brain the bodily affection, and the brain feels together with the affected part.

The allocation of the soul's faculties in the brain, as well as the role of the animal spirit—not always mentioned—can be understood as an elaboration of the Galenic account of the action of the *pneuma* in the body. This account is treated in some detail only at the end of Alfanus's translation, namely, in the chapter dedicated to the pulse. The soul of animals is examined here as divided according to three principal powers to which three main organs correspond: the brain is the principle of sensation and motion, the liver the principle of blood and nutrition, and the heart the vital principle. From the brain comes the nerve, from the heart the artery, a vessel for the spirit, and from the liver the veins. Nerve, vein and artery act together in the living body. The vein is responsible for the nutrition of nerve and artery, and the artery gives the vein the natural heat and the vital spirit. The vital spirit results when the artery, forcefully elevated, takes from the nearer veins the subtle blood, which is transformed into nourishment for the vital spirit.[21] In this passage, the Galenic ideas about *pneuma* are not fully adopted: most salient is the omission of how the vital spirit transforms into the psychic (see Knuuttila, 2004: 105–06).

The discussion of pain is not only to be set in the larger structure of the soul's powers that act in the body through different 'spirits'. The proper discussion of 'pain and pleasure' is conducted in the framework of another division of the soul discussed in this work: the division into rational and irrational (chapter 16). The irrational part can be further divided into 'obeying reason' and 'not obeying reason'. The part that obeys reason is also divided in two: the desiderative and the irascible part. Liver and heart are not here considered as nutritive and vital principles. The liver is described as an instrument of the desiderative part, which works through the sensibility [*sensibilitas*],

[21] See Nemesius Emesenus (1917: 145–46), 24.2–5: 'Conscinduntur vero adinvicem secundum maiorem partem tria haec, hoc est vena, arteria, nervus, existentia a tribus principiis animal gubernantibus: a cerebro quidem, quod est principium motionis et sensibilitatis, nervus; ab hepate autem, quod est principium sanguinis et nutribilis, vena vas existens sanguinis; a corde vero, quod est principium vitalis, arteria, quae vasculum est spiritus. Horum itaque trium coexistentium adinvicem unumquodque accipit uniuscuiusque adminiculum. Vena etenim nutrimentum impertitur nervo et arteriae, arteria autem tribuit venae calorem naturalem spiritumque vitalem. Unde nec arteria valet inveniri sine sanguine subtili nec vena absque spiritu vaporoso. Levatur vero fortiter et deponitur arteria per quandam armoniam atque rationem principium motionis habens a corde. Sed elevata quidem a vicinis venis cum violentia trahit sanguinem subtilem, qui vaporans nutrimentum fit spiritui vitali, deposita autem fumositates, quae sunt in ipsa, movet per totum corpus et per poros invisibiles, quemadmodum cor per os et per nares in exspirationibus eicit suas fumositates'.

while the heart is viewed as the instrument of the irascible part.[22] Yet in this chapter, 'affection' [*passio*] is associated not with the power of fantasy but with the 'appetitive virtue'. The association between heart and liver and the irascible and desiderative parts is reminiscent of the tripartite division of the soul in the Platonic *Timaeus*. The *Premnon physicon* refers explicitly to Aristotle, likely to *De anima* (III.9–11), where Aristotle identifies appetite as a motive force for rational and for non-rational movement (for the sources of these passages, see the footnotes in Nemesius, 2008: 128–29).

Subsequently, different definitions of affection are given. First, the *Premnon physicon* states that affections can be relative to the body, such as wounds and illnesses, or relative to the soul, as in the case of desire and anger. The affections of the soul are the result of pleasure [*delectatio*] or pain [*afflictio*].[23] It is also underscored that pain [*dolor*] occurs together with the affection, but they are not the same phenomenon. Similarly as when dealing with touch, this work explains that affection is not pain, but the 'sensibility of affection'.[24] A further definition is: 'affection is an irrational movement of the soul [brought into being] by the reception of good or evil'.[25] Several Galenic definitions of affection follow (see Nemesius, 2008: 130–31, footnote 648). The general definition reads 'affection is the transformation [*motus*] of something into something else'.[26] At the basis of the analysis of emotions lies the idea that the different parts of the soul can be both active (moved by itself) and passive (moved by something else). One part of the soul can thus act upon the others, and upon the whole body, as happens when the irascible part of the soul feels anger. Furthermore, immoderate and unnatural movements are called affections.[27]

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[22] See Nemesius Emesenus (1917: 93), 16.2–5: 'Aristoteles autem partem esse dicit et virtutem et dividit in duo ut praediximus. Sed vocantur haec communiter appetibile. Huius vero est et motus ad placitum. Appetitus enim motionis est initium. Appetentia namque animalia aguntur ad motum secundum placitum. Irrationale vero hoc quidem est non oboediens rationi, hoc autem oboediens. Iterumque oboediens rationi dividitur in duo, in desiderabile et irascibile. Sunt autem instrumenta desiderabilis quidem, quod fit per sensibilitatem, hepar, irascibilis autem cor, durum membrum motumque naturaliter suscipiens ad durum servitium et fortem motum ordinatum, ut hepar, molle viscus existens mollis desiderii factum est instrumentum'.

[23] See Nemesius Emesenus (1917: 94), 16.8–9: 'Sed quia passio aequivoce dicitur, secernendum est prius aequivocationem. Dicitur enim et corporalis ut aegritudines et ulcera; dicitur etiam passio animalis, de qua nunc est sermo, desiderium et ira. Est autem communiter et generaliter animae passio, cui accidit delectatio vel afflictio'.

[24] See Nemesius Emesenus (1917: 94), 16.9: 'Non igitur passio est dolor, sed passionis sensibilitas. Oportet hoc dignum esse ratione, ut sensibilitati subiaceat. Animalium vero passionum diffinitio haec est. Passio est motus sensibilis appetitivae virtutis in apparitione boni vel mali'.

[25] Nemesius Emesenus (1917: 94), 16.11: '[Et aliter:] Passio est irrationa[bi]lis motus animae per susceptionem boni vel mali'.

[26] Nemesius Emesenus (1917: 94), 16.12: '[Generalem vero passionem diffiniunt sic:] Passio est motus ex altero in alterum'.

[27] See Nemesius Emesenus (1917: 94–95), 16.12–14: 'Actus vero est motus activus. Activum vero dicitur, quod a se ipso movetur. Sic igitur et ira actus quidem est irascibilis, passio autem duarum partium animae adest toti corpori, quando ab ira fortiter agitur ad operationes ... Secundum hanc igitur rationem actus, cum non movetur secundum naturam, dicitur

This understanding of affection, chiefly as a phenomenon that takes place in the irrational soul, leads to the examination of pleasure and pain [*afflictio*] within the framework of the desiderative and irascible powers of the soul (Dusenbury, 2020: 491). The desiderative part is the source of both: satisfied desires result in pleasure, unsatisfied ones in pain.[28] The *Premnon physicon* then identifies four affections [*passiones*]: desire [*desiderium*], pleasure, fear [*timor*], and anguish [*angustia*].[29] The following chapters are dedicated to one emotion each. These are identified as *delectationes* (chapter 18), *afflictio* (chapter 19), *ira* (chapter 20) and *timor* (chapter 21).

The chapter dedicated to pleasures differentiates again between pleasures that belong to the soul and those that belong to the body. To feel bodily pleasure, the body acts together with the soul.[30] The dependency on the soul is clearly stated: by itself, the body is unable to feel pleasure; every pleasure involves sensation, and sensation belongs to the soul.[31] Several definitions of pleasure are discussed. One of these understands pleasure as the sensible process [*generatio*] of becoming natural—that is, of returning to a natural state, for instance, when some deficiency is alleviated in the body: when we are thirsty, our affliction is cured by drinking, and when we are cold, by warmth.[32] In the further exposition, it is underscored that pleasure is neither a habit nor an instrument, but that it is an action.[33] Different bodily pleasures result from the different sense faculties. Sight, hearing and smell do not need to unite to their sensible

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passio, sive a se moveatur sive ab altero … Nam secundum quod motus sunt a se ipsis, passibilis partis animae actus sunt et, secundum quod sunt immoderatae nec secundum naturam, non erunt actus, sed passiones'.

[28] See Nemesius Emesenus (1917: 95–96), 17.1–2: 'Dividitur igitur, ut diximus, irrationale animae, quod oboediens est rationi, in duo, hoc est desiderabile et irascibile. Iterum namque desiderabile in duo: in delectationes et afflictiones. Desiderium namque repraesentatum delectationem facit, non presentatum autem afflictionem'.

[29] See Nemesius Emesenus (1917: 95–96), 17.3–5: 'Cum enim existentium haec quidem sint bona, haec vero mala et haec quidem iam adsint, haec vero exspectentur, secundum hos modos duobus ad duo iunctis, quae sunt desiderii, in IIII dividentur, hoc est in bonum et malum et iterum in praesens et futurum. Exspectatum namque bonum desiderium est, praesens vero delectatio, et iterum exspectatum malum timor est, praesens vero afflictio. Nam circa bona versatur delectatio et desiderium, circa mala vero timor et afflictio. Unde quidam passionem in IIII dividunt: in desiderium, delectationem, timorem, angustiam'.

[30] See Nemesius Emesenus (1917: 97), 18.1: 'Delectationum hae quidem sunt animales, hae vero corporales'.

[31] See Nemesius Emesenus (1917: 97), 18.3: 'Corporales vero sunt, quae fiunt cum communitate corporis et animae ideoque corporales vocatae, ut quae sunt circa cibos et commixtiones. Solius enim corporis nullus inveniet delectationes proprias, sed potius passiones, velut excisions et fluxus et qualitates, quae sunt secundum temperantiam. Omnis enim delectatio est cum sensibilitate. Sed sensibilitatem animalem esse ostendimus'.

[32] See Nemesius Emesenus (1917: 99–100), 18.13–15: 'Diffiniunt vero delectationem generationem esse sensibilem in naturam. Sed videtur haec diffinitio esse solius corporalis delectationis, haec namque est quaedam repletio et medicamentum corporalis indigentiae et afflictionis propter indigentiam effectae. Rigescentes enim vel sitientes rigoris et sitis curantes afflictionem in calefaciendo et bibendo delectamur. Secundum accidens igitur sunt bonae et non per se ipsas ne per naturam'.

[33] Nemesius Emesenus (1917: 101), 18.23: 'Non igitur habitus delectatio; sed nec instrumentum est. Instrumenta enim propter alia sunt et non propter se ipsa. Sed delectatio non propter aliud, sed propter se ipsam est. Igitur nec instrumentum est delectatio. Restat ergo actum eam esse'.

object and are therefore purer. The pleasures that arise from sensation are common to humans and animals.[34] The brief chapter on pain distinguishes four kinds of pain: *achos, achthos, invidia* and *misericordia*. The first leaves human beings without voice; the second is an oppressing affliction. We feel envious of the property of others and we feel compassion for the pain of others.[35]

In the *Premnon physicon*, pain is treated within two different, though related schemes of the soul: the *pneuma* theory and the division of the soul into rational and irrational. The first scheme is a further elaboration of the Galenic writings. The second associates the heart and liver with the irascible and desiderative parts of the soul. In both cases, pain and pleasure are related to sensation, considered as irrational, and understood as the result of an alteration. But in the first, sensation is treated as an active faculty of the soul—that is, as an active principle that acts through material parts (similar and organic), such as the brain, the nerves, and the bodily members. The 'spirit' is also conceived of as material and as an instrument of the soul. In the second, pain (and sensation) are not linked to the brain, but to the liver. Pain and pleasure are also joined in a discussion of the emotions and regarded largely as passive: the (part of the) soul is moved not by itself, but by something else, or its movement is unnatural. The word most preferred by Alfanus to refer to physical and emotional pain, *afflictio*, can therefore be broadly understood as suffering.

Pantegni

In the 10th century, the codification of Greek-Arabic medical knowledge reached its zenith with the medical treatise *The Complete Art of Medicine* by the Persian 'Alī ibn al-'Abbās al-Maǧūsī (lat. Haly Abbas) (Jacquart and Micheau, 1990: 69). This 'large-scale synoptic work' belongs to a long tradition of Galenic synthesis (Jacquart and Micheau, 1990: 69–74; Long, 2019: 345). It was translated into Latin by Constantine the African and dedicated to the abbot of Monte Cassino, Desiderius. The oldest surviving manuscript of the first part (*Theorica*) was completed in that abbey (Kwakkel and Newton, 2019: 191) before 1087 (Green, 2019: 329). In the following I resort first to Outi Kaltio's transcription of the Helsinki manuscript for the quotations from Pantegni, Theorica (Constantinus Africanus, 2011). This version is contrasted with the 11th century manuscript, now in the Hague (Constantinus Africanus, s. XI). In the case of dissimilar renderings, I follow the latter. All translations are mine.

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[34] See Nemesius Emesenus (1917: 102–03), 18.26–27: 'Et sciendum, quod secundum unumquemque sensum diversae sint specie delectationes. Aliae enim sunt tactus et gustus et aliae visus et auditus et odoratus. Puriores vero sensuum sunt, qui non adiuncti sensibilibus delectantur ut visus et auditus et odoratus … Hominis vero propriae delectationes sunt, secundum quod homo, rationales; communes vero, secundum quod animal, sensibiles, quae sunt etiam aliis animalibus'.

[35] See Nemesius Emesenus (1917: 103), 19.1: 'Est autem achos afflictio efficiens hominem sine voce; achthos autem est afflictio aggravans; invidia autem est afflictio in alienis bonis; misericordia autem est in alienis malis afflictio'.

Kwakkel and Newton (2019) describe the *Pantegni* as an adaptation and translation of the original text. The oldest surviving manuscript does not include its second part, the *Practica*. The latter diverges strongly from its Arabic source (Veit, 2006; Green, 2009: 18). The *Theorica* basically corresponds, however, to the Theory in the *Kitāb* (Veit, 2006: 134–35). Since there are no critical editions of the *Pantegni* or the *Kitāb*, there is still no thorough comparison of the two texts. Nevertheless, Kwakkel and Newton have pointed out differences and similarities in the prologues to the *Kitāb* and the *Pantegni*, as well as different rendering of some paragraphs in the Latin and the original Arabic version (2019: 87–91, 158). Recently, Outi Kaltio proposed three compositional stages for the fifth book of the *Theorica*, while also comparing several passages of this book with an edition of the *Kitāb* (2022). It is also worth noting that, as early as the 12th century, Stephen of Antioch wrote a new version of this work, the *Liber regalis*, for he judged Constantine's version as defective (Jordan, 1994: 294; Green, 2019: 336).

At the core of this medical encyclopaedia is the distinction between theoretical and practical medicine. The theoretical part, which concerns us, is organized according to a scheme that distinguishes between natural things, non-natural things and things against nature.[36] Natural things refer to the components of the body, while non-natural are the things that influence the body and its well-being, and things against nature are the things that harm the body (Klemm, 2013: 28). The natural things that account for the bodily architecture and functioning are classified into seven components: elements, mixtures, simple parts, composite parts (organs), powers, spirits and actions. The most basic component of all bodies is the elements, the qualities of which constitute the mixtures (Klemm, 2013: 29). The simple parts are composed of mixtures and constitute in turn the composite parts. These first four components are responsible for the physical make-up of the body. The other three—powers, spirits and actions—explain how a body lives and operates. The *Pantegni* discusses these living and operating principles in the fourth book. The soul is described as governing the animated body. To rule the body, the soul has different powers that preside over a set of functions and organs. There are three main powers of the soul: natural, 'spiritual', animated (or animal). The most basic is the natural power, the spiritual power is responsible for vivifying the body, and the animated power rules over reason, sensation and voluntary motion.[37] The natural power encompasses the appetitive, the contentive, the digestive and the

[36] Aristotle had already distinguished what happened 'against the normal course of nature' [*contra naturam*], 'in accordance with nature' [*secundum naturam*] and 'above nature' [*supra naturam*]. See Honnefelder (2000: 81).

[37] See Constantinus Africanus (2011: 37r–37v (164–67)), IV.1: 'Omnia enim corpora aut ex anima sunt et natura, aut ex sola natura, quia natura animata regit corpora, uel inanimata. Sola autem regit anima … Igitur uirtutes tres sunt generales, una attinens naturę quę uocatur naturalis, altera solum uiuificans est anima et uocatur spiritualis. Alia dans intellectum sensum quoque et uolutarium [*sic*] motum similiter est animę, et uocatur animata'.

expulsive virtues. To the spiritual power belong the actions of dilation and contraction, while voluntary movement belongs to the animated power. Some actions are the product of two or more (derived) powers. For instance, desire requires the appetitive and the sensitive powers. In the case of sensation, two powers are at play: one moves what is sensed to the sentient, and the other properly senses.[38] Because Constantine sometimes names the actions 'powers' [*virtutes*], the reading is not straightforward.[39] Even so, what we are dealing with can be better understood as a system of powers and sub-powers (for an outline, see **Table 2**).

Power	**natural**	**spiritual (vital)**	**Animal**
function	nutrition, growth/generation	respiration, natural heat	sensation, voluntary movement
spirits (*pneuma*)	natural	spiritual	animal
actions	natural	spiritual	animal
= sub-powers (selection)	appetitive, contentive, digestive, expulsive	(dilation and contraction)	imagination, reason, memory, five senses
principal members	liver/testicles	heart	brain
auxiliar members	mouth, stomach, intestines, veins, etc./uterus, vulva, penis, testicles	arteries, lungs, throat, etc.	sense organs, nerves, muscles

Table 2: The system of powers and sub-powers in the *Pantegni*.

A series of actions correspond to each of these powers; they are defined primarily as the movement of a certain power to accomplish its function.[40] The actions and the members upon which they operate are correspondingly classified as natural, spiritual and animal. The 'animated' members, characteristic of animals, respond to sensation

[38] See Constantinus Africanus (2011: 47v (206–07)), IV.17: 'Cum superius de naturali spirituali siue animata uirtutibus sit dictum, de actionibus uidetur esse dicendum. Quedam enim uirtuti naturali, quedam spirituali, quedam attinent animali. De unaquaque autem actione diximus cum de singulis disputaremus uirtutibus. Vnde intelligimus quandam simplicem unum operantem sicut in naturali appetitiua contentiua, digestiua, et expulsiua, in spirituali dilatare et constringere, in animali motus uoluntarius. Est et actio quędam composita quę duo facit uel plura sicut in naturali desiderium siue deportatio generare et nutrire. Desiderium enim ex duabus uirtutibus appetitiua et sensiua [*sic*] generatur. Deportatio rursus ex duabus uirtutibus, appetiua, et ex pulsiua. Generare enim ex triplici uirtute fit, mutatiua, formatiua et nutritiua. Nutrire faciunt uirtutes duę, augmentatiua et pascitiua. In spirituali, anhelitus dilatatione et constrictione componitur. In animali sensus duabus uirtutibus, una est mouens sensum ad sentiendum, altera quę sentit. Quę omnia potest intelligere cognita qualibet uirtute'.

[39] In general, the terms used by Constantine are not consistent. For instance, fantasy and imagination, and intellect and reason, are mostly treated as synonymous.

[40] See Constantinus Africanus (2011: 37v (166–67)), IV.1: 'Actiones nichil sunt aliud quam quidam uirtutis motus ad id quod efficitur'.

and voluntary motion. The instruments for the action of the power of sensation are the eyes, the organs of hearing and smelling, the nerves and the muscles. The nerves are responsible for the ability of the whole body to sense. They bring the exterior, sensible things to the brain, which arranges them. The nerves and the muscles do what the brain orders.[41] The 'spiritual' members are responsible for breathing and for the preservation of natural heat. Among these members are the heart, the lungs, the diaphragm and the arteries. The natural members are divided in two: the nutritive and the generative. The nutritive members (including the mouth, the stomach, the intestines, the liver, the veins) transform the food in the substance of the members of the whole body. The generative members ensure the regeneration of individuals through the members that can procreate, such as the uterus, the vulva, the penis and the testicles.[42]

The overall functioning of the powers in the body is resumed in the chapter on the spirits. For each power, there is a 'spirit'. Thus, there are natural, spiritual and animal spirits. The natural spirit originates in the liver and expands to the whole body through the veins. It directs and augments the natural power in the members and watches over its actions. This spirit comes from the fume of perfect blood that has been cleaned and purified from all humours in the liver.[43] The spiritual spirit originates in the heart and goes to all bodily members through the arteries.[44] In contrast with the veins, the

[41] See Constantinus Africanus (2011: 1v–2r (23–25)), II.1: 'In animatis principale est cerebrum, quia in ipso memoria ratio et intellectus sunt, et de ipso uirtus sensualis et motus uoluntarius uel alia menbra progrediuntur. Actionis suę adiumenta sunt oculi, auditus instrumenta odoratus, nerui, lacerti. Vnumquodque enim horum exteriora portat, ad cerebrum, quod sibi portata disponit. Nerui et lacerti mouentur ad opera a cerebro discreta, et disposita, et neruis ab ipso ad totum corpus sensualia feruntur'. See also Constantinus Africanus (2011: 1r (20–21)), II.1: 'Menbra autem animata fecit deus in omnibus animalibus propter sensus et uoluntarios motus. Sed in homine propter hoc, et propter intellectum, et rationem fecit cerebrum, et oculos odoratus, instrumenta, nares, auriculas, linguam neruos, et lacertos'.

[42] See Constantinus Africanus (2011: 1r–1v (21–23)), II.1: 'Actiones autem tres sunt. Spiritualis, naturalis, animalis, quibus corporis instrumenta sunt similia. Vnde menbra animatam uirtutem sequentia uocantur animata, et in aliis similiter … Menbra spiritualia facta sunt, propter flatus spiracula, et caloris naturalis conseruantia, ut sunt pectus et panniculi, eius cor et pulmo, cum suis canalibus fauces, diafragma et arterię. Naturalia menbra bipertita sunt, quedam nutritiua, quedam generatiua. Nutritiua cybum mutant, in menbrorum totius corporis substantiam. Omnia enim humana et bestialia corpora consumuntur, ab aere, et naturali calore. Necesse igitur fuit ut eorum consumptio, ad seruandam integritatem, cuiusque rei pararetur. Hec autem menbra sunt nutritiua os dentes os stomachi, stomachus, intestina, epar, spl[en], fel renes, uesica, uenę. Menbra generatiua sunt facta, ut specificarentur generalia, et indiuiduarentur specificata. Quia enim omnia indiuidua naturaliter consumuntur, necesse fuit ut per genitalia repararentur. Que sunt matrix, uel uulua, uirga testiculi, et spermatis uasa'.

[43] See Constantinus Africanus (s. XI: 25r), IV.18: 'Omnis ergo spiritus est tripertitus. Est enim naturalis, est spiritualis, est [ac] animalis. Naturalis in epate nascitur, unde per uenas ad totius corporis uadit menbra uirtutem naturalem regit et augmentat, actiones eius custodiens. Hic igitur ex perfecti sanguinis fumo nascitur, qui in epate mundificatur, et digestus ex omnibus humoribus clare depuratur'. For this passage as reversing the relationship between *virtutes* and *spiritus*, so that the powers are subservient to the spirits, see Rocca (2012: 651).

[44] See Constantinus Africanus (s. XI: 25r), IV.18: 'Spiritualis spiritus in corde nascitur uadens per arterias ad totius corporis menbra spiritualem uirtutem augmentans atque regens, actionesque eius custodiens'.

arteries have two membranes and transport not only blood, but also 'spirit'.[45] The spiritual spirit goes from the heart to the brain through the carotid arteries. When these arteries penetrate the skull to reach the brain, they divide and form a sort of net under the skull (also known as the 'miraculous net'). The two arteries that enter this net stretch across it. The spiritual spirit spreads through this 'net' many times. In this manner, it is purified and transformed in the animal spirit.[46] Afterwards, this spirit, subtler and worthier than the other spirits, goes forth from the two arteries that stretch over the net and enters the cavities in front of the brain (see Bertola, 1958: 51–52; Harvey, 1975: 15–16).[47] There it is purified from what is thrown away through the palate and the nose. In this state, it continues to the back of the brain through the middle cavity.[48] In the passage from the middle to the back cavity, there is a structure that looks like a worm. This structure is built from two long little pieces, similar to the human buttocks, positioned on the sides. Due to its disposition and composition, the worm can expand and contract itself, opening and closing a space that forms between the two pieces. When it shrinks, it allows the spirit to pass from the middle cavity to the rear one.[49] This happens when the spirit changes its nature. Once the spirit has passed,

[45] See Constantinus Africanus (2011: 10v (58–59)), II.12: 'Venę incipientes ab epatę fuere necessarię, ut sanguinem ab eodem ad menbra corporis nutrienda ferrent … Quę de una tunica sunt factę, non de duabus sicut arterie. Arterię enim spiritum recipiunt et sanguinem. Iste uero solum sanguinem'.

[46] See Constantinus Africanus (2011: 47v–48r (206–209)), IV.18: 'Hic enim spiritus a corde ad cerebrum per arterias ascendit, quę iuueniles dicuntur. Hęc arterie cum ad cerebrum ueniant craneum usque ad cerebri sedem penetrant, ubi multipliciter delusę telantur sicut rete subtus craneum dilatante. Deinde retę duę principales aggrediuntur, quę retortę super idem retę protenduntur. Spiritualis spiritus cum a corde progreditur, in telę modum multipliciter profusus, et ibi morans implicitus, tamdiu ibi digeritur quoad depuratus clarificetur, sicque animalis spiritus ab eo, generatur'. For the 'rete mirabile', see also Constantinus Africanus (2011: 12v–13r (66–69)).

[47] See Constantinus Africanus (2011: 23v (110–11)), III.11: 'Rete fuit necessitas, ut uitalem spiritum per iuueniles ascendentem uenas dequoquat, et in naturam animalis spiritus mutari faciat. Cum enim hic sit subtilior et dignior aliis spiritibus fecit natura retę, ubi inmorans uitalis spiritus dequoquatur, atque subtilietur, ut in naturam inmutetur animalis. Qui cum per duas uenas a tela exeuntes cerebri, uentriculos ingrediatur ibi, magis magisque subtiliatur'.

[48] Constantinus Africanus (2011: 48r (208–209)), IV.18: 'Post hic spiritualis recte per ambas arterias super rete retorfas [footnote: retortas] egreditur, et ad uentriculos prore cerebri dilabitur. Vbi iterum subtiliatus quod depuratum supererat eiecit, per suos mediatus, id est palato atque naribus ipse uero uadit ad uentriculos puppis, per uiam mediam medii uentriculi atque puppis'.

[49] See Constantinus Africanus (2011: 22r–22v (104–07)), III.11: 'Illud autem frustulum, uermis est uocatum. Cuius unum caput a fine pineę incipit, et in uentriculum puppis secedit. A cerebro duo longa exeunt frustula, uermis, lateralia, et nates hominum iunctas, assimilantia. Hęc medii lateralia sunt uentriculi, subtilibus operta pelliculis. Hę pelliculę, cum natibus sunt solidatę utrimque. Substantia uermis non natibus est similis. De pluribus enim compositus est frustulis, in modum concatenationis de subtilibus facte uentriculis. Nates eiusdem sunt substantię, sed uermis non est uniformis, quia in extremitate sua puppi cerebri iam uicina, ubi pellicularum finitur subtilitas, subtilis est et gibbosus. Vnde paulatim dilatatur, quo natiuum intersticium inde repleatur. Quibus sociatus unum corpus cum natibus efficitur. Vnde cum uermis in uię longitudine dilatetur, nates perfectissimę clauduntur. Cum uermis rugatur nates quoque aperiuntur, quia pelliculę gibbositati uermis iunctę cum eodem trahuntur. Quantitas foraminis fit ex rugatione uermis. Eius rugatio longitudinis est curtacio, latitudinis ampliatio, et in modum sperę conformatio. Iste uermis in dorso natium ligatur, cum duabus cordis. Quod fit, ne motu nimio, de suo moueatur loco. Est autem durior cerebro, ne forte patiatur quoquo-

the ‘worm’ returns to its former shape and closes the aperture. The spirit in the back of the brain builds motion and memory, while the spirit that resides at the front of the brain forms sensation and fantasy, and the spirit in the middle cavity brings about intellect or reason.[50]

The Galenic imprint of this overarching account of the operating of the soul in the living body is unmistakable. It deeply connects the soul with specific bodily functions and bodily parts. The principal powers with their corresponding actions and spirits act upon the human (and animal) physical make-up. In these passages, psychic (cognitive) and physiological functions are dealt with together. The subtle, yet material spirits accomplish these functions and connect successively the different sub-systems (natural, spiritual, animal) with each other.

As already mentioned, in the *Pantegni* the cognitive functions of fantasy, reason and memory are placed in concrete parts of the brain. The brain is thus conceived of as the place and foundation of the animal power. Its sub-powers (fantasy, reason, memory) are explicitly called ‘mind’.[51] The location of these powers in the three cavities of the brain and the role of the animal spirit in them is reiterated in several passages. The connection between these three sub-powers is examined in the chapter on the animal virtue in more detail:

> the power of imagination transmits what it forms and imagines to the intellect. The intellect judges and distinguishes what it really receives from the imagination or by the intellect alone … The [animal spirit] opens the members that are apt to act and to move voluntarily. The things that are only [from] the intellect are also sent to memory. Memory shapes the things that are in the intellect, preserving them, until it directs them to action (Constantinus Africanus, 2011: 45r (196–97), IV.9; cf. Harvey, 1975: 17).[52]

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modo. Cuius est iuuamentum, ut claudat foramen inter puppim et medium uentriculum, et intraturo animali spiritui aperiat, postquam intrauerit claudat’.

[50] See Constantinus Africanus (2011: 48r (208–209)), IV.18: ‘Quę non semper est aperta, quia in concauitate sua qua in corpore uermem assimilatur est clausa. Cum autem natura expetat ut spiritum hunc ad puppim mutat, rugatio uermis, spiritus eum transilit, et uermis se postea claudit ut prius fuerat. Spiritus autem qui ad puppim pertransit, motum ibi et memoriam facit. In prora inmorans sensum creat et fantasiam. Spiritus medii uentriculi, intellectus siue ratio fit’. For the elaboration of the *pneuma* in the lungs, heart and ventricles of the brain in Galen, see Rocca (2012: 633, 636–37).

[51] See Constantinus Africanus (s. XI: 24r), IV.9: ‘Hae tres uirtutes fantasia, ratio et memoria, mens uocantur, quibus ab inrationabilibus differimus animalibus, et maxime intellectu, quia aliae duae ex intellectu prodeunt’. For the difference between animals and humans with respect to the ‘perfection’ of these powers, see also Constantinus Africanus (2011: 37v (166–67)).

[52] ‘Virtus enim imaginationis, quę formatur et imaginatur, mittit et intellectui. Intellectus iudex et discretor est rei, quam ab imaginatione realiter siue solo intellectu suscipit. [Ad operanda manualia spiritus animatus.] Ille aperit menbra quę operi sunt habilia ut motum expleant uoluntarium. Quę in solo sunt intellectu memorię tantum mandantur. Memoria format intellectum posita ad custodiendum ea donec ad altum [*sic*] ducat’. Following Constantinus Africanus (s. XI: 24r), I read ‘actum’ instead of ‘altum’.

These sub-powers are thus presented as actively operating with the information first transmitted to the imagination. The animal spirit plays a role in transferring the information of the intellect to the memory. Intellect and memory deal with two kinds of objects: the ones received by the imagination and the ones produced only by the intellect. Memory seems not only to preserve these objects, but also to actively recall the images that are stored in it.

In the discussion of the causes of death, the brain is described as crucial to life: 'If the brain is damaged, the voluntary movement that goes from it to the chest is [also] damaged, so that breath is withdrawn and natural heat is extinguished'.[53] The substances that are expelled from the brain and the chest can also extinguish natural heat if they penetrate its cavities.[54] In a similar manner, the 'pulse of the brain' can be affected by congestion in the cavities of the back of the brain due to cold and dry humours.[55] Changes in the layers of the brain have consequences for the pulse, too.[56] On the other hand, exterior causes may affect the brain: drunkards, for instance, suffocate their natural heat because of the overflow of the veins and of the cavities of the brain.[57]

Cognitive impairments are related to the bad complexion of the brain in several chapters throughout the book. The 'mind' (fantasy, reason and memory) can be affected by the cold or warm complexion of the brain. For instance, a cold brain complexion causes people to turn dumb and stupid. If accompanied by 'phlegmatic humours', this complexion can affect the cavities, causing epilepsy. A hot complexion results in mental disorders.[58] As in the *Premnon physicon*, physical damage of the cavities of the brain results in damage to the faculties that operate in them. Thus, if the frontal part of

[53] Constantinus Africanus (2011: 43v (190–91)), IV.7: 'Si cerebrum corrumpitur motus uoluntarius ab eo progrediens ad pectus corrumpitur. Vnde post consequitur ut anhelitus auferatur, et calor naturalis extinguatur'.

[54] See Constantinus Africanus (2011: 44r (192–93)), IV.7: 'Tota substantia expellitur cerebro et pectore, nimiam incesionem patientibus. Quę cum usque in uentriculos eorum penetret, calorem naturalem extinguet. Huius caloris nutrimentum extollitur ex uenarum et arteriarum incisionibus. Vnde totus sanguis exiens, calorem extinguit naturalem'.

[55] See Constantinus Africanus (2011: 110r (456–57)), VII.9: 'Pulsus in congelatione quia morbus in cerebro est ex constipatione et in uentriculis puppis, ex humoribus frigidis et siccis, similis est litargicis, sed tamen durior et fortior, et minus diuersior, quod ex siccitate contingit. Humidas enim uirtutes organorum emollit'.

[56] See Constantinus Africanus (2011: 110r (456–57)), VII.9: 'Hii utrique morbi pulsum inicio sui faciunt thetinosum ex distensionibus pelliculorum cerebri, quę multitudinem collegerunt humorum'.

[57] See Constantinus Africanus (2011: 44r (192–93)), IV.7: 'Nimiis repletionibus, ut si homo humoribus, cibis quoque uel potibus adeo infarciatur, ut multis horum inconculcationibus [footnote: inculcationibus] * [*marginal note: calor naturalis] suffocetur, quod ebriosis solet ex uenarum et uentriculorum cerebri repletione, et si pinquissimis hominibus quibus uenę et arterie nimia inconculcatę [footnote: inculcatę] pinguedine adeo coartantur ut calor iste extinguatur'.

[58] See Constantinus Africanus (2011: 84r (352–53)), VI.12: 'Actio regitiua siue ordenatiua, est fantasia, ratio, et memoria. Quę omnia menos [*sic*] sunt uocata. Passio mentis, triplex est. Aut enim tota aufertur, et hęc ex frigida complexione substantię patitur. Que si paulatim cerebro accedat, homines reddit quasi dormientes, et stupidos et si frigiditas cum nimiis humoribus flegmaticis subrepat, et uentriculos cerebri subito impleat, et oppilari faciat, apoplexiam generat quod si subito et partim cerebri impleat uentriculos, partim uero non, epilemsia fit, aut mens minuitur'.

the brain is damaged, fantasy is impaired: one sees what is not there. If the middle part is damaged, all reason is lost, so that one is not able to discern. If the back of the brain is hurt, memory is either completely impaired or one forgets what one should do.[59] The obstruction of the cerebral cavities can also cause apoplexy and epilepsy. Apoplexy occurs when the three cavities are obstructed, so the sensible and mobile powers are impaired, and the sense organs and voluntary motion cannot function.[60] Epilepsy is like apoplexy, but on a smaller scale. Some of the cavities are obstructed, as well as the pathways for the nerves that move the body. When someone suffers from an epileptic seizure, he or she experiences pain together with the corruption of the senses.[61] Diseases that affect the brain like phrenitis or obstructions of the brain do not allow the motive power 'to pass to the spirit', and so this spirit is separated from the body.[62]

Affections of the brain thus have physical and psychological consequences. The brain, the principal organ of the animal power, is related to the activities of the spiritual power (preservation of natural heat, respiration). Brain damage or malfunctioning can indirectly cause changes in these activities, potentially leading to death. In addition, it can cause impairment to the cognitive faculties that occur in it (fantasy, reason, and memory) or to the powers that originate from it: sensation and voluntary movement.

The last two powers, sensation and voluntary motion, require not only the brain to operate, but the nerves as well: sensation takes place when the animal spirit goes from the cavities of the brain to the nerves.[63] The nerves responsible for sensation proceed

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[59] See Constantinus Africanus (2011: 84v–85r (354–55)), VI.12: 'Sed quia mens tripliciter est diuisa, in fantasiam rationem, et memoriam, quarum unaquęque principaliter suum locum uidentur optinere, necesse est et si paciatur una pars, illa actionem suam amittat, ceterę uero actionibus suis non priuentur. Si enim cerebri patitur propra inpeditur a suo cursu fantasia, ut aut tota inmutetur uideas, quę realiter non uidentur … Si media pars cerebri paciatur, aut tota ratio aufertur, non discernens discernenda, a discernendis sicut quidam de quo galienus dicit quia ex rationis defectione quecumque in domo habuit, uisus est proiecisse, quod fecit, quia ratione caruit, fantasiam, et memoriam bene sanam retinuit … Si puppis paciatur cerebri, memorię nocumentum fit, aut enim tota aufertur aut obliuiscatur omnium que facere debet …'.

[60] See Constantinus Africanus (2011: 146v (602–603)), IX.6: 'Apoplexia et epilempsia nascuntur ex uentriculorum cerebri constipationibus. Est autem apoplexia cum tres uentriculi cerebri oppilantur, et subito unde uirtus sensibilis et nobilis transire prohibentur, ut menbra sensibilia et motus uoluntarius aliquid non operetur. Cessant ergo uirtus et motus regitiuę uirtutis actiones, cessando inueniuntur'.

[61] See Constantinus Africanus (s. XI: 63r), IX.6: 'Epilepsia est cum totum corpus spasmum patitur, ut in terram cadat infirmum … Causa enim causa est apoplexia. Si tamen minor in fortitudine et uirtute. Causa enim quae epilepsiam facit non est in omnibus cerebri uentriculis, sed quedam oppilantur uentriculorum et uie neruorum menbra corporis mouentium'.

[62] See Constantinus Africanus (2011: 43v (190–91)), IV.7: 'Morbi officiales sunt apostemata, calida uel frigida, quę predicta patiuntur menbra sicut apostema cerebri, quod dicimus esse frenesim, uel opilationem suam sicut apoplexiam et epilempsiam siam in quibus morbis cerebrum clauditur, frigidis et congelatis humoribus ne uirtus motiua ad spiritum transire ualeat. Vnde consequitur, ut auferatur'.

[63] See Constantinus Africanus (2011: 45r (196–97)), IV.9: 'Virtutes sensibiles et motum uoluntarium prout diximus cerebrum facit, neruis mediantibus, quibus eorum instrumenta esse comprobantur, cum spiritus animatus a uentriculis cerebri ad menbra per neruos exeat'.

from the frontal part of the brain, and their softness accounts for their sensibility. The nerves responsible for motion are harder and come from the back of the brain.[64] The connection between the nerves and the faculties of sensing and moving can be shown when a nerve is damaged, because sensation and movement in the corresponding member ceases.[65] These passages of the chapter on the animal power show again the interdependence between a power of the soul (the animal power), a composite part (the brain) and simple parts (the nerves).

As mentioned earlier, the five (sub-) powers of the senses belong to the animal power: sight, hearing, taste, smell and touch. Each of them has a nature that is compatible with one (or two) of the four elements: sight is fiery, hearing is airy, smell is fumous (combines earth and water), taste is watery, and touch is earthy.[66] The chapter on the nerves refers in more detail to six pairs of nerves that proceed from the brain to the different sense organs, giving to the eyes the 'sense of sight', to the tongue and to the palate the 'sense of taste', to the ears the sense of hearing. They also bring the ability to feel to the nose, lips, gums, teeth and to the interior organs too.[67] The action of the animal power is to convert, and therefore 'sensation is nothing other than the alteration of the organs in the qualities of the things that they are to perceive'.[68] There is, then, a close relation between the qualities of specific objects of the world and the

[64] See Constantinus Africanus (2011: 45r–45v (196–99)), IV.9: 'In tractatu neruorum diximus a prora egredi neruos, facientes sensus, ut molliciem sentiat facilius. Quibus motus efficitur uoluntarius, a puppi egrediuntur, nec propter motum facile rumpantur'. For voluntary movement, see also Constantinus Africanus (2011: 47r (204–05)), IV.16: 'Virtus uoluntarii motus a cerebro per neruos egreditur, quia uel ab eo principaliter uel secundarię exeunt, sicut a nucha per quos hic sensus pertingit ad lacertos, ut per eum motus lacertis detur'.

[65] See Constantinus Africanus (2011: 45r–45v (196–99)), IV.9: 'Vnde intelligitur, quia si neruus incidatur, sensus et uoluntarius motus menbro cuius erat, auferantur. Solus sensus uel motus uoluntarius, sicut nerui fuerat uirtus'.

[66] See Constantinus Africanus (s. XI: 24r), IV.10: 'Virtutes sensuum quinque sunt, uisus, auditus, gustus, odoratus, et tactus. Virtus uisus subtilior est aliis omnibus. Quippe cum eius natura sit ignea … Post uisum, maior subtilitas sequitur auditum. Cuius sensus est aereus, et percussi aeris sonitus, quod uox [est] esse intelligitur. Vox enim nichil est aliud quam aeris tactus. Post auditum maior subtilitas sequitur odoratus. Cum enim natura sit fumea fumus uero inter terrestria et aquosa se habeat. Post odoratum subtilior est gustus, cuius natura aquosa est ad quem omnes pertinent liquores. Tactus crossior est omnibus quia natura sua est terrena utpote habenda in duris et mollibus asperis et lenibus calidis et frigidis. Horum singula sic sua explent officia, ubi ut mutent et aptent se in naturas rerum quas sentiunt. Quas cum tandem mens sentiat, intellectui preparat'.

[67] See Constantinus Africanus (2011: 8r (48–49)), II.10: 'Neruorum a cerebro exeuntium .ui. paria sunt, quidam ad oculos progrediuntur ut darent eis sensum, uisus alteri ad eosdem ut darent motionem. Aliorum quidam uadunt ad linguam, et sensum gustui dant, quidam ad timpora, ut motum commedendi prebeant. Isti quidam ad narium exeunt extremitatem, et usque ad labra, quidam ad ginguas, atque dentes tendunt, donantes eis tactum. Quartum uero priorum parium per palati summum ut ei donet gustum. Quinti pars uadit ad auriculas, ut auditum eis prebeat, pars ad latitudinem pectoralium lacertorum, ut uirtutem det motuum. Sexti paris pars tendit ad uiscera ut per eam sentiant pars ad lacertos gutturales ut eos moueat. Septimum uadit ad lacertos linguę atque gutturis, ut inde possint moueri'.

[68] See Constantinus Africanus (s. XI: 21v), IV.1: 'Actio uirtutis animatę quędam est conuertibilis sicut sensus, qui nichil est aliud quam mutatio menbrorum in qualitates rerum sensu capiendarum'.

ability of each sense power to perceive them. In this manner, internal and external material conditions must be satisfied for the power of sensation to work.

Pleasure [*delicia*] and pain [*dolor*] are also related to the power of sensation and to its ruling organ, the brain. The author discusses them in the context of the things against nature in the sixth book, immediately after dealing with the accidents of the animal power and the sense powers. While sensation is understood as the 'usual' transformation of the sense organ into the perceived object, pain and pleasure are explained as a deviation from this norm. Thus, they are not only an alteration, but a great or sudden alteration (see Salmón, 2018: 45). Pain occurs when a natural thing is transformed into an extra-natural thing—that is, when some bodily feature or state ceases to be such. Conversely, pleasure is the change of an extra-natural thing into a natural thing, such as illness into health.[69] This seems to convey, as in the *Premnon physicon*, the idea of pleasure as a returning to a natural state. Of all the senses, touch is the one that feels more pleasure or pain because, to some extent, the sense of touch and its object are separated from each other.[70] Touch cannot transform rapidly into the sensed thing and cannot rapidly be altered by this thing. This is not the case with the other senses: sight transforms completely into the sensed thing, as it takes on the colour of the perceived object. For this reason, it scarcely suffers pleasure and pain. The transformative ability of the other senses are between touch and sight.[71] Here again external material conditions and the characteristics of each sense power or organ account for pain and pleasure. A further passage explains that pain occurs 'when the affected part takes up one part from another part, and this latter part seems to suffer in the new (in the affected) part'.[72] This happens, for instance, if sight perceives a brilliant

[69] See Constantinus Africanus (2011: 87v–88r (366–69)), VI.17: 'Delectacio siue dolor habentur in omnibus sensibus. Horum utrumque sensum mutat in naturam rei sensę. Sed delectacio rei extra naturam in naturalem est mutacio, sicut infirmitatis insanitatem* [*marginal note: dolor rei naturalis in extra natura est transformatio est sicut sanitatis in infirmitatem]. Hęc si sint pauca, neque dolores faciunt, neque delicias, et si paulatim ueniant neque delicias neque dolores generant'. In the manuscript in the Hague, the lines referring to pain are missing. See also Constantinus Africanus (2011: 88r (368–69)): 'Si enim mali humores paulatim in humano corpore aggregentur, nulli dolores inde nascuntur, et exinanita paulatim humores nullas similiter gignunt delectationes. Sed si mutatio subita sit et magna, utraque generantur grauia'.

[70] For this idea in medical texts of the Late Middle Ages, see Salmón (2005: 66).

[71] See Constantinus Africanus (2011: 88r (368–69)), VI.18: 'Delectationes siue dolores in tactu nascuntur grauiores, quia tactus grauior est omnibus, neque in naturam rei sensę subito mutatur, neque ab ipsa re sencienda cito percutitur. Sunt ergo quoquomodo a se inuicem separata, tactus et res sense. Vnde cum paulatim tactui accedat, necesse est eum ledat. Alii sensus non tantum dolent siue delectantur. Visus enim ex toto in rem sentiendam mutatur, sicut ad colores. Vnde parum patitur dolores siue delectationes. Visus itaque et tactus, in aliorum positi sunt extremitatibus. Alii enim inter multum et parum sunt medii'.

[72] See Constantinus Africanus (2011: 88v (370–71)), VI.18: '…tunc tandem dolor sentitur, quia pars diuersa partem de parte suscipit, et pars in parte uidetur pati'.

white colour: sight is separated and dispersed. The same happens with the other senses: when the object of sensation is too intense, it tears apart its corresponding sense.[73]

This idea that the sensation of pleasure and pain is different for each of the senses is also present in the *Premnon physicon*, but the two texts work on very different premises. The *Premnon physicon* resorts indirectly to the notion of medium: if a sense requires a medium, thus, if it is separated from its object, it is purer. In the case of the *Pantegni*, this difference has nothing to do with the medium, but with the capacity of each sense to transform itself in its object. Of the five senses, touch is the worst at transforming itself: touch is, in a manner, more distant to its object than the rest of the senses are to their objects.

Pain is associated not only with the objects of sensation, but also with the channel of transmission, the nerves, and their origin, the brain. Without the nerves, there would be no sensation or voluntary motion in the bodily members, bones, ligaments, cartilages or glands. The *Pantegni* specifies here that some physicians say that pain is in the teeth of bone, because they seem to tremble and to experience pain. However, others say that there is no pain in the teeth, because the pain is in the gums and in the nerves, and the origin of the nerves is the brain.[74] We feel pain as well due to bad complexion, and pain is not the same for the whole body: we feel it in some members, and not in others, and we feel it in some members more, and in others less.[75]

As we have seen, in the *Pantegni*, pain (and pleasure) is, like sensation, related to the brain, the nerves, and the animal power. Pain plays almost no role in the discussion of emotions. The latter are dealt with in the last chapter of the book dedicated to the six 'non-naturals' (see Cohen-Hanegbi, 2017: 3). This chapter, entitled 'On the actions of the soul', set emotions in the context of the vital spirit and natural heat (Knuuttila, 2004: 214). Six emotions are distinguished here: joy [*gaudium* or *laetitia*], distress [*tristitia*],

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[73] See Constantinus Africanus (2011: 88v (370–71)), VI.18: 'Dolor in uisu de albo est colore quo separatur uisus, et dispergitur sicut calidum uel de colore nigro, qui adunatur tandem separatur, sicut frigidum. In gustu ex nimia acciditate [*sic*] doletur uel amaritudine quę partes separant linguę sicut solent calida facere uel ex pontico coadunante et constringente, sicut frigidum. In auditu ex maxima uoce siue acuta dolor nascitur, quia auditus separet sensum sicut albedo nimia uisum'.

[74] See Constantinus Africanus (2011: 7v–8r (46–49)), II.10: 'Nerui fuerunt necessarii ut sensum atque motum ferrent menbris corporis ossibus ligamentis, et cartilaginibus pinguedini et glandibus. In natura enim sua, nullum horum habet sensum neque motum, sed horum singula, prout dicemus fuerunt necessaria. Quidam medicorum dentes osseos sensus habere dicunt, quia labiis trementibus et ipsi tremere uidentur et dolorem patiuntur. Dolor autem non est sensus. Quod negant alii dicentes, dolorem illum esse in gingiuis et neruis. Quorumlibet neruorum fundamentum est cerebrum, cum uoluntarii motus atque sensuum fit firmamentum'.

[75] See Constantinus Africanus (2011: 88v (370–71)), VI.18: 'Non tantus dolor sentitur quando mala complexio diuersatur, neque per omne equale est corpus quia in aliquibus menbris, in aliquibus uero non, in quibusdam plus, in quibusdam minus…'.

fear [*timor*], anger [*ira*], anxiety [*angustia*], and shame [*verecundia*] (Knuuttila, 2004: 215).[76] As one can see, none of them is named pain [*dolor*] or pleasure [*delicia*]. This is consistent with the statement of Salmón, according to which pleasure and pain were related to emotions, but not themselves considered emotions (2018: 40).

The *Pantegni* offers a much more consistent view of the human body than does the *Premnon physicon*. The living body is understood in Galenic terms as composed in an ascending material scale and as the place where different faculties are at play. The material composition of this body corresponds to the activity of the different soul powers. It also underscores that the well-functioning of the soul powers is responsive to and, to a certain extent, depends on this material composition. The anatomy of the brain and of the psychic functions illustrates this point best: the animal power works with and through cavities, animal spirits, nerves, sense organs and organs able to move. One of the instruments of the animal power, the animal spirit, is also understood as material, although in order to operate it has to have gone through a process of subtilization. Brain damage or alteration of its normal anatomy results in impairment of the cognitive and sensory faculties. Sense perception seems to be conceived at the same time as the ability of the sense organ to match its object of perception and of the sense power to receive this alteration and to communicate it to the brain. In particular, the phenomenon of pain (and pleasure) can be understood as being grounded in a material conception—that is, in the transformation of bodily states or features.

Pain, Brain and the Body-Soul Relationship

Despite the differences in the overall understanding of the living body and the diversity of soul powers that operate within it, the *Premnon physicon* and the *Pantegni* consider the brain as one of the most important organs of the living body. The brain is a distinct characteristic of sentient beings—that is, of animals. The cavities of the brain are imagined as the locus of fantasy, reason and memory, as well as of sensation and voluntary motion. Alfanus's translation clearly links the power of fantasy with the five senses, while Constantine distinguishes more neatly between the powers that operate only in the brain and those that need the nerves as well, thus separating imagination and the five senses. The cerebral anatomy presented in both works allows the distinction of different psychological capabilities in specific parts of the brain. The cavities are explicitly understood as 'instruments' of the animal power or of the soul: they do not explicate by themselves, the existence of these capabilities.

[76] See Constantinus Africanus (2011: 77v (326–27)), V.37: 'Cum ergo ex accidentibus animę corpora mutentur, oportet eorum diuersitates dicantur, et circa corpora eorum actiones. Accidentia animę, ira, leticia, tristicia, angustia, timor, et uerecundia'.

In the *Pantegni*, where the underlying system of the living body is singular, some passages associate the operation of the different powers with the physical characteristics of one of their instruments—the 'spirits'. The increasing subtlety that this substance acquires going through different bodily organs enables the corresponding power to carry out its operation in the different organs. In particular, the animal spirit, which has already been purified in the 'miraculous net', goes through further modifications when entering each cavity of the brain, enabling the operation of the psychic powers of fantasy, reason and memory. The 'mind', as Constantine calls these three powers, depends for its functioning not only on the animal spirit, but also on further material conditions: normal brain functioning is affected by damage to the cavities, bad complexion, or deformation of the organ due to illnesses.

The explanation of pain in both works reveals profound dissimilarities concerning the notion of a soul as distinguished in faculties. The *Premnon physicon* treats pain [*afflictio*, sometimes also *dolor*] first in the discussion of the senses, considered in turn as part of the power of imagination. In this context, pain is described as a co-sensibility of the brain towards the change produced in the sense organ (and transmitted to the brain through the nerves). However, the proper place of pain is found in a more encompassing distinction of the soul into rational and irrational parts. The treatment of physical and non-physical pain is then set together with the discussion of emotions, where both are understood basically as affections. They are not a process in the brain, the product of some bodily change, but rather a 'passion of the soul' ['*passio animae*']. Pain is a conscious, irrational and passive experience: not the brain, but the soul suffers.

In the *Pantegni*, emotions are discussed among the six 'non-naturals'. The discussion of pain [*dolor*] focuses neither on its relationship with the psychic faculties nor on the material apparatus responsible for sensation—that is, in the nerves, the organs and the animal spirit (though we find several considerations of this kind in the books dedicated to the 'things against nature'). Rather, pain is understood as an abnormal case of sensation, where the normal process is interrupted due to some characteristic of the object (too intense) or due to the moment of apprehension of the object (too sudden). The phenomenon of pain, and also of pleasure, takes place when the material characteristics of the object meet the material characteristics of the sense organ: the 'parts' that trespass the boundaries between natural and non-natural (or the parts in new parts) are responsible for pain. Here, pain seems to be conceived as something that concerns only the organs and the alterations caused by the objects of the senses. Nevertheless, we also find the notion that pain can be felt only where there are nerves—and the origin of the nerves, as the many passages discussing the animal power and its relationship to sensation emphasizes, is in the brain. It is the brain, then, that suffers.

The *Premnon physicon* and the *Pantegni* thus offered to the Latin West not only two concepts for pain [*afflictio* and *dolor*], but also two accounts of it: pain as an affection of the soul and pain as an experience of the composite body-soul. The first places pain largely in the context of the discussion of emotions, developed in turn when dealing with the rational and non-rational parts of the soul. It encompasses also physical and emotional afflictions. The second understands pain within the framework of sense perception. It underscores the external and internal material characteristics that allow pain. Although both treatises present a more or less systematic approach to the body-soul relationship, the *Pantegni* in particular can be seen as a novel alternative to previous traditional interpretations: the soul is considered only in the context of its relationship to the body. Nevertheless, in explaining pain, both works put forward a specific terminology and a set of problems and distinctions. The short contextualization of pain at the beginning of this paper indicates that these were to have a long-lasting impact.

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