

Inventing Diagnosis: Theophilus' *De urinis* in the Classroom (*)

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SUMMARY

1.—Uroscopy and medieval medicine. 2.—Western urine doctrine before Theophilus. 3.—Theophilus and his *De urinis*. 4.—The text of Theophilus in the West. 5.—The «Chartres» and «Digby» commentaries. 6.—Theophilus in the classroom. 6.1.—The *scientia* and *doctrina* of urine: the *accessus*. 6.2.—Physiological context: the production of urine. 6.3.—The state of health: natural urine. 6.4.—From semiotics to diagnosis: thin, white urine. 6.5.—Theoretical re-framing of semiotics: the chromatic scale of urines. 7.—Comparison with the Digby commentary. 8.—Inventing diagnosis.

ABSTRACT

This paper shows how the two earliest Latin expositions of Theophilus' *De urinis* understood diagnosis in different ways. The «Chartres» commentator sees urine as a sign of physiological process and something which is derived from a disease state. By contrast, the Digby commentator is more concerned with how uroscopy functions at the bedside as a tool that enables us to infer disease states from urine. Though they understand the role of diagnosis differently, both commentaries reflect the new intellectual

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context of twelfth century medicine, where physical signs cease to be mere prognostic omens, and become tools for attaining knowledge of processes otherwise inaccessible to the senses.

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The twelfth century's new collective and curricular style of medical instruction, its *via scholaris*, re-defined medicine as a *scientia*, that is, a uniquely certain type of knowledge derived from principles and demonstrated by reason. It also identified it with *physica*, the branch of philosophy concerned with the natural world. As a *scientia* and a branch of philosophy, medicine was also *doctrina*, the kind of knowledge which could be conveyed by formal instruction, based on texts (1). In the words of Constantine the African's *Pantegni*, it became *medicina litteralis* (2).

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- (1) See PESENTI, Tiziana. *Arti e medicina: la formazione del curriculum medico*. In: Luciano Gargan; Oronzo Limone (eds.), *Luoghi e metodi di insegnamento nell'Italia medioevale (secoli XII-XIV)*, Galatina, Congedo editore, 1989, pp. 155-177; BYLEBYL, Jerome J. The Medical Meaning of *Physica*. [In: Michael R. McVaugh; Nancy G. Siraisi (eds.), *Renaissance Medical Learning: Evolution of a Tradition*] *Osiris*, 1990, 2nd series, 6, 16-41; JORDAN, Mark D. The Construction of a Philosophical Medicine: Exegesis and Argument in Salernitan Teaching on the Soul. [In: *ibid.*] *Osiris*, 1990, 2nd series, 6, 42-61, esp. pp. 60-61; O'BOYLE, Cornelius. Medicine, God, and Aristotle in the Early Universities: Prefatory Prayers in Late Medieval Medical Commentaries. *Bulletin of the History of Medicine*, 1992, 66, 185-209; SIRAIISI, Nancy G. *Taddeo Alderotti and his Pupils: Two Generations of Italian Medical Learning*, Princeton, NJ, Princeton University Press, 1981, chps 4-5; OTTOSSON, Per-Gunnar. *Scholastic Medicine and Philosophy: A Study of Commentaries on Galen's Tegni (ca. 1300-1450)*, Napoli, Bibliopolis, 1984; AUSÉCACHÉ, Mireille. Gilles de Corbeil ou le médecin pédagogique au tournant des XIIe et XIIIe siècles. *Early Science and Medicine*, 1998, 3, 191-192.
- (2) CONSTANTINE. *Pantegni*, edited by Marco T. Malato and Umberto de Martini, Roma, Istituto di storia della medicina dell'Università di Roma, 1961, praefatio, p. 39. Elsewhere in this paper, I shall cite from the edition of the *Pantegni* published in Basel by Heinrich Petri in 1539, and which Mark Jordan has identified as the more reliable of the two Renaissance editions: JORDAN, Mark. The Fortune of Constantine's *Pantegni*. In: Charles Burnett; Danielle Jacquart (eds.), *Constantine the African and 'Al, ibn al-'Abbās al-Magūs, The «Pantegni» and Related Texts*, Leiden, Brill, 1994, pp. 286-290. However, this edition does not contain the

The components of the *Articella* seem to have been chosen to illustrate these novel claims. The *Isagoge* of Johannitius, the *Aphorisms* and *Prognostics* of Hippocrates, and eventually after the mid-twelfth century, the *Ars medicinae* or *Tegni* of Galen furnished at once a classical pedigree and a complete theoretical framework for a medical science (3). These are texts about what doctors think and know, not about what doctors are supposed to do. But the *Articella* also contained two other less obviously theoretical texts, both of Byzantine provenance: the pulse treatise by Philaretus, and the handbook of uroscopy by Theophilus Protospatharios. As manuals of diagnostics, both texts have a distinctly practical savour: they are about the things that doctors do, not about what they think. Indeed, they may have been chosen for inclusion in the *Articella* precisely to counterbalance the collection's strongly theoretical orientation. It is worth remarking that the *Isagoge* originally contained material on pulse and urine which was excised in Constantine's translation (4).

preface. Since it also does not contain the *Practica Pantegni*, this section of the work, as well as the *Viaticum*, is cited from the Lyon edition of 1515, printed by Bartholémi Trot.

- (3) On the origins and development of the *Articella*, see KRISTELLER, Paul Oskar. Nuove fonti per la medicina salernitana del secolo XII. *Rassengna storica salernitana*, 1957, 18, 61-75; Bartholomaeus, Musandinus and Maurus of Salerno and other Early Commentators of the 'Articella', with a Tentative List of Texts and Manuscripts. *Italia medioevale e umanistica*, 1976, 19, 57-87; and revisions and expansions of the latter in his *Studia sulla Scuola medica salernitana*, Napoli, Istituto italiano per gli studi filosofici, 1986, pp. 97-151. On the *Articella* and medical theory, see JORDAN, Mark D. Medicine as Science in the Early Commentaries on 'Johannitius'. *Traditio*, 1987, 43, 121-145, and JORDAN, note 1, pp. 42-61. On the role of the *Articella* in providing a historical pedigree for medicine, see CRISCIANI, Chiara. History, Novelty and Progress in Scholastic Medicine», [In: Michael R. McVaugh; Nancy G. Siraisi (eds), *Renaissance Medical Learning: Evolution of a Tradition*]. *Osiris*, 1990, 2nd series, 6, 118-139, and KIBRE, Pearl; SIRAISSI, Nancy G. Matheolus of Perugia's Commentary on the Preface to the *Aphorisms* of Hippocrates. *Bulletin of the History of Medicine*, 1975, 49, 405-428.
- (4) JACQUART, Danielle. Principales étapes dans la transmission des textes de médecine (XIe-XIVe siècle). In: Jacqueline Hamesse; Marta Fattori (eds.), *Rencontres de cultures dans la philosophie médiévale: traductions et traducteurs de l'Antiquité tardive au XIVe siècle. Actes du colloque international de Cassino 15-17 juin 1989*, Louvain-la-Neuve/Cassino, Université catholique de Louvain/Università degli studi di Cassino, 1990, p. 257.

The purpose of this paper is to examine the fortunes of one of these practical texts, Theophilus' *De urinis*, in the academic medical milieu of the twelfth century. The commentaries on this text reveal much about how even uroscopy could be construed as a *scientia*, a *doctrina*, and a part of medical *physica*. They also throw light on the genesis of a new «philosophical» concept of diagnosis.

1. UROSCOPY AND MEDIEVAL MEDICINE

Few medical practices are more distinctively western and medieval than uroscopy (5). Pulse-diagnosis acquired a fully elaborated theoretical justification in Antiquity, but ancient uroscopy was a fairly marginal prognostic skill, with little in the way of a coherent physiological rationale, except in cases of urinary tract illness (6). The development of this

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- (5) Despite this, the historiography of Western uroscopy is very meagre. For a stimulating hypothesis on its rise and apparent decline in academic medicine, see McVAUGH, Michael R. Bedside Manners in the Middle Ages. *Bulletin of the History of Medicine*, 1997, 71, 201-223. Late Antique and Byzantine uroscopy has been studied in DIMITRIADIS, Konstantin. *Byzantinische Uroskopie*, Bonn dissertation, 1971, and in the brief survey by DIAMANDOPOULOS, Athanasios A. Uroscopy in Byzantium. *American Journal of Nephrology*, 1977, 17, 222-227. A valuable history of early medieval uroscopy in the Latin West has been sketched in KEIL, Gundolf. *Der Kurze Harntraktat des Breslauer 'Codex Salernitanus' und seine Sippe*, Bonn dissertation, 1969, and in KEIL, Gundolf. *Die urognostische Praxis in vor- und frühsalernitanischer Zeit*, Freiburg-im-Breisgau Habilitationsschrift, 1970. The latter, unfortunately, has not yet been published; I am grateful to Dr Keil for providing me with a photocopy of the typescript. See also KEIL, Gundolf. Die mittelalterliche Übersetzung vom Harntraktat des 'Bartholomäus'. *Sudhoffs Archiv*, 1963, 47, 417-455. Salernitan uroscopy has been surveyed by OLDONI, Massimo. Uroscopy in the Salerno School of Medicine. *American Journal of Nephrology*, 1994, 14, 483-487, and by RIHA, Ortrun; FISCHER, Wiltrud. Harndiagnostik bei Isaak Judaeus, Gilles de Corbeil und Ortolf von Beierland. Beobachtung zur Bearbeitungstechnik. *Sudhoffs Archiv*, 1988, 72, 212-224. The classical work, VIEILLARD, Camille C. *L'urologie et les médecins urologues dans la médecine ancienne. Gilles de Corbeil: sa vie, ses oeuvres, son poèmes des urines*, Paris, Librairie scientifique et littéraire, 1903, remains useful.
- (6) This relatively narrow definition of the scope of uroscopy is exemplified by HIPPOCRATES. *Prognostics*, 12, edited by W. H. S. Jones, Cambridge, Mass, Harvard University Press, 1923, pp. 24-28; by HIPPOCRATES. *Coacae praenotations*,

technique and its rationale was essentially the achievement of late Antiquity and the Middle Ages. The rationale was grounded in the three-stage model of digestion expounded most fully by Galen. Each stage produces a corresponding waste product: from the first digestion in the stomach come the faeces; from the second digestion in the liver, red bile, black bile, and urine; and from the third digestion in the members, a variety of residues, including the sediments in urine, sputum, sweat, hair, earwax and so forth (7). The premiss is that examining these superfluities after they emerge on the outside of the body will reveal something about the unseen digestive process within. Urine, however, is the easiest of these residues to obtain in a quantity sufficient to permit examination, and the easiest to differentiate and classify (8).

2. WESTERN URINE DOCTRINE BEFORE THEOPHILUS

Differentiating and classifying urines was one of the major projects of late Antique medicine. An embryonic system can be detected in

7.34.564 sq. In: É. Littré (ed.), *Oeuvres complètes d'Hippocrate*, vol. V, Paris, J.-B. Baillière, 1846, p. 712 sq.; and by HIPPOCRATES. *Aphorisms*, 4.68 sq. This point is made by ANGELETTI, Luciana Rita; CAVARRA, Berenice. Critical and Historical Approaches to Theophilus' *De urinis*. Urine as Blood's Percolation and Uroscopy in the Middle Ages. *American Journal of Nephrology*, 1994, 14, 283, and by WITTERN, Renate. Diagnostics in Classical Greek Medicine. In: Yosio Kawakita (ed.), *History of Diagnostics. Proceedings of the 9th International Symposium on the Comparative History of Medicine*, Tokyo, Division of Medical History, The Taniguchi Foundation, 1984, p. 78. On the weak concept of diagnosis in Hippocratic medicine, see PAGEL, Walter. Prognosis and diagnosis: A Comparison of Ancient and Modern Medicine. *Journal of the Warburg and Courtauld Institutes*, 1938-39, 2, 382-398. To be sure, the first book of the *Epidemics* takes a somewhat broader view of the usefulness of urine inspection, and uses analytical categories which later became systematized in uroscopy, namely texture, colour and sediment. However, *Epidemics I* was not available in Latin in the Middle Ages; moreover, Galen's commentary on the *Epidemics* survives only in Latin, and only for book six, which suggests that it had little influence in the Greek and Arab world in which uroscopy was developed.

(7) KEIL, note 5, p. 16.

(8) On later medieval schemata for analysis of sweat, sputum, faeces, skin-eruptions, as well as haematology (a diagnostic technique closely modelled on uroscopy), see KEIL, note 5, pp. 17-18.

Caelius Aurelianus' *Tardae passiones* and Celsus' *De medicina*. Aretaeus furnishes the first recorded explanation of how the kidneys separate urine from blood in *De causis et signis acutorum morborum* (9). But uroscopy as a diagnostic technique really developed in the Byzantine East, beginning with Oribasius and Aetius of Amida. It is interesting that uroscopy particularly appealed to medical writers with strong philosophical interests, such as Stephen of Athens (10) and Magnus of Emesa (11). Theophilus was the legate of this tradition.

Little of this reached the West before the early Salernitan period. There are very few Latin uroscopy texts written before 1100, and even fewer records of the use of uroscopy in a clinical context. Descriptions of clinical practice in the early Middle Ages mention diagnosis from pulse and occasionally haematoscopy (12), but rarely uroscopy (13).

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- (9) CAELIUS AURELIANUS. *Tardae passiones* 5.3.55-57, edited by Gerhard Bendz, *Corpus medicorum latinorum* 6.1, Berlin, Akademie Verlag, 1993, p. 886; CELSUS. *De medicina*, 2.4.8-9, 2.5.11-13, 2.7.11-13, edited by F. Serra, *Scriptorum romanorum quae extant omnia* 164-166, Pisa, Giardini, 1976, pp. 88-89, 91-92, 95-96; ARETAEUS. *De causis et signis acutorum morborum* 2.9, edited by Karl Hude, *Corpus medicorum graecorum* 2, Berlin, Akademie Verlag, 1958, pp. 30-31.
- (10) On the career and influence of Stephen of Athens, see BISCHOFF, Bernhard; LAPIDGE, Michael. *Biblical Commentaries from the Canterbury School of Theodore and Hadrian*, Cambridge Studies in Anglo-Saxon England 11, Cambridge, Cambridge University Press, 1995, p. 49 *sq.* Stephen composed a number of works on scientific and medical subjects, including a commentary on the *Aphorisms* of Hippocrates, edited by Leendert G. Westerink, *Corpus medicorum graecorum* 11.1, 3, Berlin, Akademie Verlag, 1985-1992, another on the *Prognostics*, edited by John M. Duffy, *Corpus medicorum graecorum* 11.1, 2, Berlin, Akademie Verlag, 1983, and a urine treatise edited in BUSSEMAKER, C. *Traité d'Etienne sur les urines*, publié pour la première fois d'après un manuscrit de la Bibliothèque royale. *Revue de philologie, de littérature et d'histoire anciennes*, 1845, 1, 415-438, 543-560. On this treatise, see ANGELETTI, Luciana Rita; CAVARRA, Berenice. The *Peri ouron* Treatise of Stephanus of Athens: Byzantine Uroscopy of the 6th-7th centuries AD. *American Journal of Nephrology*, 1997, 17, 228-232, and DIMITRIADIS, note 5, pp. 33-36.
- (11) See BUSSEMAKER, U. Cats. Über Magnus von Emesis und dessen Buch vom Harne. *Janus*, 1847, 2, 273-297; DIMITRIADIS, note 5, pp. 29-32.
- (12) For example, in the *Casus sancti Galli*, Ekkehard IV of St Gall tells how the great monastic physician Notker predicted, on the basis of the smell of the blood emitted by a patient's bleeding nose, that the patient would fall ill with smallpox:

DYNAMIS. Acta Hisp. Med. Sci. Hist. Illus. 2000, 20, 31-73.

The most common pre-Salernitan uroscopy text is Pseudo-Galen's *De urinis* (14). The Pseudo-Galen is a fusion of two texts: the urine treatise proper, and its variable addenda, the most popular of which was a «Catalogue of Urine Rules», possibly composed in the seventh century in western Europe. The core text provides a theoretical basis for uroscopy. It comprises an apology for the usefulness of the technique, a sparse physiological account of urine formation, a discussion of the technical requisites for urine inspection, and finally, a catalogue of urines of various colours and textures, in no particular order, together with their pathological significances. However, there is no attempt to explain the logic behind urine's semiotic role (15). The «rules» are bald formulae, almost all of which are prognosticatory, and almost exclusively for acute diseases and fevers (16). What is most interesting perhaps about Pseudo-Galen is that the inspection of urine does not always, or even usually, furnish a diagnosis. Diagnosis is the product of a whole array of symptoms and signs; the real value of uroscopy is prognosis (17).

HAEFLE, Hans F. (ed.). *Ekkehard IV. St. Galler Klostersgeschichte*, Ausgewählte Quellen zur deutschen Geschichte des Mittelalters 10, Darmstadt, Wissenschaftliche Buchgesellschaft, 1980, p. 240.

- (13) KEIL, note 5, p. 22, note 18. See also WALLIS, Faith. Signs and Senses: Diagnosis by Pulse and Urine in AD 1000. *Social History of Medicine*, 2000, 13, 265-278.
- (14) KEIL, note 5, pp. 22 and 25. Probably composed in the fifth or sixth century, this text was translated from Greek into Latin in the early medieval period. It was first edited by LEISINGER, Hermann. *Die lateinischen Harnschrift pseudo-Galens*, Beiträge zur Geschichte der Medizin 2, Zürich and Leipzig, Orell Füssli, 1925, and again by Gundolf Keil.
- (15) KEIL, note 5, p. 25.
- (16) E.g. «In quo de orina [*sic*] alba aut multa in acutis febris solitudine [*sic*] eiusdem egritudinis futuram nunciat»: KEIL, note 5, p. 62.
- (17) For example, Pseudo-Galen says: «Hi quidem colores urinae [i.e. red and tawny] frequenter a nobis uisi sunt secundum diuersitatem egritudinis.... Debet enim caute requiri utrum cum dolore an sine dolore sit, an uero husionem in uetro facit uel si calida est dum egerit ipsa urina ac si ueluti uisciditatis iacet, id est quidam stipticum sit. Ita diuisas etiam quam maxime et diligenter intendere nebulas quasdam quas greci nifias appellant, quia diuersitatem suam et in cunctanter demonstrat. Sed cum caute aspexeris, ibi repperies mala uel bone futurae discusionis signa, id est vitae et mortis»: KEIL, note 5, pp. 57-58.

3. THEOPHILUS AND HIS *DE URINIS*

When western students of medicine encountered Theophilus' *De urinis* in the eleventh century, they recognized a subject with which they were already somewhat familiar. However, Theophilus' treatment of this topic represented a wholly unprecedented order of sophistication.

Theophilus' life and career are very difficult to trace. We do not even know exactly when he lived, though the seventh century seems highly likely. He was a follower of Stephen of Athens (who flourished in the second half of the sixth and the beginning of the seventh centuries), and like Stephen, a prolific medical scholiast and writer (18). His *De urinis* summarizes and schematizes the entire Late Antique/Byzantine tradition of uroscopy. Though modern commentators tend to regard this uroscopic tradition as evidence of Byzantine empiricism (19), Theophilus, like Stephen before him, seems not to have been a clinician. His title *protospatharios* indicates that he was an official in the court bureaucracy, but he is also identified in the Greek manuscripts as a monk and a philosopher. He stands, then, in the tradition of the *iatrosophistae*, or physician-philosophers.

Theophilus' talent lay in synthesis and schematization. He analyzed urine under three aspects: it was a liquid substance, which might be «thick» or «thin»; it came in a range of colours from white to black; and it contained sediments which varied as to their position in the urine

(18) He wrote scholia on the *Aphorisms* of Hippocrates, treatises on pulse, urine and excrements, as well as a compendium of Hippocratic-Galenic therapeutics and a general work on anatomy and physiology in 5 books: see KRUMBACHER, Karl. *Geschichte der byzantinischen Literatur*, Handbuch der klassischen Altertumswissenschaft 9.1, 2nd edition, München, Beck, 1897, p. 614; BISCHOFF; LAPIDGE, note 10, p. 55. On the *De urinis* see ANGELETTI; CAVARRA, note 6. The Greek text has been edited by IDELER, Julius L. *Physici et medici Graeci minores*, Berlin, 1841, reprinted Amsterdam, Adolf M. Hakkert, 1963, pp. 261-283. The Latin text was edited from the mid-eleventh-century manuscript Einsiedeln, Stiftsbibliothek, MS 32 (1060) by KEIL, note 5, pp. 97-135: this codex, together with Auxerre, Bibliothèque municipale, MS 240, is the oldest witness to the text.

(19) ANGELETTI; CAVARRA, note 6, p. 285.

flask, their colour and their shape. Theophilus worked out the permutations and combinations of these three in an orderly manner, and linked them to the notion of *crasis*, the qualitative complexion of the body in health and illness. Underlying the entire treatise is the concept that illness is disorder of *crasis*, and that this disorder leaves an imprint on the urine. Heat and cold control the range of colours in the urine, while moisture and dryness determine its texture. Therefore, the visible aspect of the urine is a direct image of the complexional state of the body. Theophilus, significantly, is interested in the urine of healthy people, as well as of the sick.

Perhaps the most significant difference between Pseudo-Galen and Theophilus is that Theophilus presents uroscopy as a tool of diagnosis, that is, as a means to detect and identify a disease state, as distinct from predicting the outcome of a disease state, which is prognosis. Theophilus shared the pre-modern conception of disease as an event rather than an entity, a morbid change in the body driven by changes in the relationship of the elemental qualities of hot and cold, wet and dry. Therefore, diagnosis was essentially applied humoral physiology and humoral aetiology.

4. *THE TEXT OF THEOPHILUS IN THE WEST*

The date of the Latin version of Theophilus and the identity of the translator continue to be a matter of debate. It is not even certain whether the translation pre- or post-dates the work of Constantine the African. Its companion text, Philaretus on pulses, was certainly available in Salerno in Constantine's time, for Alfanus of Salerno (d. 1085) used it in his own *De pulsibus* (20). But doubts persist about Theophilus, perhaps because Constantine the African, in the prologue to his translation of Isaac Judaeus' treatise on urines, says that he could find no reliable, authoritative work on the subject in Latin, and so elected to translate an

(20) CREUTZ, Rudolf. Der frühsalernitaner Alfanus und sein bislang unbekannter 'Liber de pulsibus'. *Sudhoffs Archiv*, 1937, 29, 57-83; BLOCH, Herbert. *Monte Cassino in the Middle Ages*, 3 vols, Cambridge, Mass, Harvard University Press, 1986, vol. 1, p. 98.

Arabic work (21). Did he know Theophilus' book, but not consider it «reliable and authoritative»? It is impossible to prove this, but it is not unlikely. Constantine's interests slanted towards the clinical (22). Isaac situates uroscopy at the bedside, and in a clinical context: he is interested, for example, in the quantity and frequency of urination, whether it is painful, and so forth (23). He also gives detailed instructions for the examination process (24), and he discusses the meaning of various colours and textures of urine in a very nuanced way. One might say that for every rule Isaac gives, he has two exceptions, which is perhaps an index of his clinical realism. Isaac is realistic as well about the limitations of uroscopy; it is highly reliable for analyzing some conditions, less so for others (25). Above all, Isaac is interested in whether the urine is a good sign or a bad sign, and what it prognosticates about the patient's case (26). This is a handbook for the practising doctor. It is certainly not a text for teaching. It is diffuse, repetitive, and unsystematic. It

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- (21) «In latinis quidem libris nullum auctorem invenire potui. qui de urina certam et autenticam cognitionem dederit. Unde ad arabicam linguam me deverti. in qua quemdam in huius modi notitia admirandum repperi. quem ego latine lingue ad transferendum destinavit dare..». [FONTANA, Eugenio (ed.). *Il libro delle urine di Isacco l'Ebreo tradotto dall'arabo in latino da Costantino Africano*, , Pisa, Giardini, *Scientia veterum* 67, 1966, p. 143]. Keil (note 5, p. 83) argues that Constantinus Africanus' apparent ignorance of Theophilus means that this text could not have been translated before 1070, or later than its earliest manuscript witnesses, i.e. ca. 1150. On the other hand, he also remarks that the translator's terminology is redolent of early medieval texts, and quite free of Arab influence (p. 84), and that the script and presentation of the Einseideln codex recall Carolingian and even pre-Carolingian practices. This suggests that the archetype of the Latin Theophilus pre-dates, and perhaps considerably, the end of the eleventh-century (p. 92). On the other hand, Jacquart (note 4, p. 257) argues that the Theophilus translation came from the same milieu, and was made at the same time as, or slightly before, the Constantinian translation of Johannitius.
- (22) KEIL, note 5, p. 20. Peter the Deacon says that Constantinus first attracted attention in Salernitan medical circles for his interest and skill in uroscopy: see BLOCH, note 20, vol. 1, p. 99.
- (23) Cf. FONTANA, note 21, pp. 159-160.
- (24) FONTANA, note 21, pp. 152-154.
- (25) FONTANA, note 21, pp. 155-157.
- (26) FONTANA, note 21, pp. 156-157.

schematizes practical matters (27) but not theoretical ones. There is plenty of interesting theoretical matter in the treatise, but apart from the description of the generation of urine in the opening chapter, it is scattered and unconnected.

Theophilus is in many ways exactly the opposite: he ignores the clinical context, gives no instructions for conducting a urine examination, downplays prognosis in favour of diagnosis, and is concise and systematic. Since the *Articella* was assembled for teaching, it comes as no surprise that Theophilus and not Isaac was chosen to represent uroscopy, though as we shall see, Isaac was used as a resource by those who studied Theophilus. The biggest surprise, perhaps, was that uroscopy was represented in the *Articella* at all. This has much to do with the philosophical coloration that Theophilus had given the subject, a philosophical coloration that the first *Articella* commentaries did their best to enhance.

5. THE «CHARTRES» AND «DIGBY» COMMENTARIES

These earliest commentaries, dating from the twelfth century, are all part of sets of commentaries on all the texts of the *Articella*. Two of these series are anonymous—the Chartres and Digby group—and two are ascribed to known figures in the contemporary world of scholarly medicine, Bartholomaeus of Salerno (fl. ca. 1175) and Maurus of Salerno (d. 1214).

The Chartres and Digby commentaries probably represent the oldest stratum of *Articella* commentaries, because unlike the Bartholomaeus and Maurus sets, neither contains a commentary on Galen's *Ars*, a text which was incorporated into the *Articella* only after the middle of the twelfth century. If the primitive *Articella* was in place by about 1100, this would seem to date the Chartres and Digby glosses to the period ca. 1100-1150, but there are textual complications which may forbid such easy conclusions.

(27) For example, the seven conditions of urine inspection: see note 24.

The Chartres commentary derives its name from the manuscript Chartres, 171, a twelfth-century codex which was destroyed in the bombing of Chartres Cathedral library in 1944 (28). Though the manuscript is generally thought to have been written at Chartres, this is by no means established; indeed, its palaeographical characteristics may indicate another, perhaps English, provenance (29). Nonetheless, it was definitely in Chartres by the later twelfth century. Interestingly, the Chartres library also possessed a twelfth century manuscript of the *Articella*, minus Galen, but including Constantine's *Pantegni* (no. 160) (30).

Though the Chartres manuscript has perished, save for the few folios photographed by Loren MacKinney, its commentary on Theophilus survives in two versions: London, British Library, MS Royal 8.C.IV, fols. 163r-166r (s. XIII-XIV) [L], and Erfurt, Stadtbibliothek, Amploniana, MS F 276, fols. 1r-3v (s. XIII) [A] (31). The London version of the

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- (28) See description in *Catalogue générales des manuscrits des bibliothèques de France. Départements*, Paris, Plon, 1890, vol. 11, p. 90, and discussion by BURNETT, Charles. The Contents and Affiliation of the Scientific Manuscripts Written at, or Bought to, Chartres in the Time of John of Salisbury. In: Michael Wilks (ed.), *The World of John of Salisbury*, Oxford, Basil Blackwell for the Ecclesiastical History Society, 1984, pp. 129-130 and 139-140. The opening pages of all the treatises in Chartres, Bibliothèque municipale, MS 171 were photographed by Professor Loren MacKinney before the war. These photographs are now in the Library of the University of North Carolina at Chapel Hill. I am grateful to Professor Michael McVaugh for bringing this fact to my attention, and for arranging for me to obtain copies.
- (29) The scribe of Chartres, Bibliothèque municipale, MS 171 exhibits the following «English symptoms»: trailing-headed a, final t with downward tick at the end of the headstroke, x with a long left-hand stroke curling around the base of the preceding letter, and a slight overall backward slope: see KER, Neil R. *English Manuscripts in the Century After the Norman Conquest*, Oxford, Clarendon Press, 1960, pp. 35-37. These characteristics are also visible in Chartres, Bibliothèque municipale, MS 160, the contemporary exemplar of the *Articella*: see TRIBALET, Jacques. *Histoire médicale de Chartres jusqu'au XIIIe siècle*, Paris, Vigot, 1936, p. 68 (where it is mistakenly identified as MS 170). At this stage, I can only offer this as a very tentative possibility. In my projected edition of the Chartres and Digby commentaries on Theophilus, I hope to test this hypothesis more rigorously.
- (30) Described by BURNETT, note 28, p. 139.
- (31) The London manuscript also contains the Chartres commentary on the *Prognostics*, as well as the Digby commentaries on the *Aphorisms*, *Prognostics*, Theophilus and

Theophilus commentary begins with the same incipit as did the lost Chartres manuscript, but it breaks off incomplete. The Erfurt recension begins with a slightly different incipit (which I shall explain shortly), and contains a major lacuna in the section on the formation of urine, but it ends with the same explicit as did the lost Chartres manuscript (32). The London and Erfurt versions are in fact the same commentary, or almost so.

The London and Erfurt texts in fact look like transcripts by two students of the same professor's lecture. Though not always verbally identical, they are always extremely close in wording and order. However, one version will provide a fuller exposition than the other, though neither is evidently more complete. Moreover, it does not seem possible to explain their divergences from the known behaviours of scribes. Rather, the variations suggest that the same matter is being processed by two different minds. There is strong, though circumstantial, evidence that this matter is being taken in orally, not read from a text. Sometimes one reporter will summarize in a few words what the other will dilate upon. Sometimes one will not quite grasp a point that the other conveys very clearly. It also seems that one student arrived in class on time, and the other was late. The Chartres commentary begins with an *accessus*, which is complete in the London version, but which begins in Erfurt in mid-stream, with the *intentio*.

In the circumstances, only a very limited comparison of the Chartres manuscript to the London and Erfurt codices is possible. Certainly, the beginning of the commentary in Chartres 171 resembles that of the

Philaretus. The Erfurt manuscript contains the Chartres commentaries on the *Aphorisms* and Philaretus, besides the one on Theophilus. For descriptions, see WARNER, George F. ; GILSON, Julius P. *Catalogue of Western Manuscripts in the Old Royal and King's Collections*, London, British Museum, 1921, pp. 229-232, and SCHUM, Wilhelm. *Beschreibendes Verzeichniss der Amplonischen Handschriften-Sammlung zu Erfurt*, Berlin, Weidmannsche Buchhandlung, 1887, pp. 184-186.

(32) In his study of Chartrian scientific manuscripts of the twelfth-century, Charles Burnett (note 28, p. 145) classed the Erfurt commentary as a text unrelated to the Chartres/London it, but as Kristeller recognized, the London and Erfurt versions are virtually the same commentary: see KRISTELLER, note 3, p. 76.

London recension, but the fact that the Erfurt version begins in the middle of the *accessus* and omits much of the first 24 sentences of the Chartres/London version leaves very little material for comparison, given that only a column of the beginning of the Chartres version is preserved on film. Nonetheless, it can be said that where London and Erfurt diverge, Chartres reads with London. Unfortunately, the London manuscript ends incomplete, whereas the final folio of Chartres (fol. 59r) survives. In comparing this to the Erfurt text, we find that while the Chartres text is generally of superior quality, the exposition in the Erfurt text is often fuller (33). In short, Erfurt is not just a corrupt version of Chartres/London, but a distinct recension.

The significant differences between London and Erfurt fall into roughly three categories:

A. *Fuller exposition in one manuscript than in the other*

E.g.

London fol. 165ra: Cum id est [*recte*: enim] durus fuerit humor unde febris efficitur. ante eiciuntur. alii humores quam ille.' unde deterius.
Erfurt fol. 2rb: Cum enim durus sit humor unde hec febris fit. si antequam decoquatur. id est ante vii accessiones detur cataricum. potius purgantur alii humores quam ille.' unde deterius contingit.

B. *Collapsed lemmata*

E.g.

London fol 163rb: *Medicus* quidem *ratione* quia in theorica studuerat. *Inexpertus uero re[m]* id est non exercens se in practica.
Erfurt fol. 1va: *Medicus ratione. Inexpertus uero re* quia in theorica studuerat. non exercens se in practica.

C. *Incomplete sentence in one manuscript, complete in the other.*

E.g.

London fol. 163va: He autem uene usque ad portam uenam locatam in sima epatis.

(33) For example, Chartres, MS 171, fol. 59ra5-7: «In complexionibus enim pinguis urina mingitur cum ypostasi non possunt iungi». Erfurt, Stadbibliothek, MS Amploniana, F 276, fol. 3vb40-42: «In complexionibus bene istos colores coniungo primum. qui<a> in hiis complexionibus. ubi pinguis urina mingitur cum ypostasi non possunt iungi colores significantes indigestionem. ut albus et similia».

Erfurt fol. 1va: he autem uene usque ad portam uenam in sima epatis locatam deducuntur. ubi efficitur secunda decoctio caliditate ipsius epatis.

These variations have to be evaluated in the context of substantial verbatim or near-verbatim agreement throughout. No. 1 can be explained by one student growing weary, or falling behind in shorthand, and deciding to summarize instead. No. 3 might be due to lapse of attention, or perhaps stopping to sharpen a pen. It should be noted as well that Erfurt becomes progressively more like London as the commentary proceeds. Does this suggest that one or other of the students needed to «settle into» the shorthand process during the first phase of the lecture?

The Chartres commentary's method is to paraphrase freely and expand on Theophilus' text section by section, often with extensive excursuses. At the end of each section, it adds some brief and discontinuous glosses of interesting or obscure phrases and terms in the section. It is not interested in walking the reader line through Theophilus, but in conveying the larger contours of his meaning, and in opening up the text to questions and elaboration. One might describe it as a *lectura* with additional *glosule*.

The Digby group of commentaries is named after its oldest and only complete witness, Bodleian Library Digby 108 (s. XII). Like the Chartres commentaries, this group contains no glosses on Galen's *Ars*. However, the manuscripts of the Digby group suggest that there is a link between this group and Bartholomaeus of Salerno. Manuscript Bern A 52 substitutes Bartholomaeus' commentary on Philaretus for the Digby one. Vatican, Reg., MS lat. 1908 contains the Digby commentaries on Theophilus and Philaretus, accompanied by Bartholomaeus' commentary on Galen's *Ars*. Moreover, in Cambridge, Peterhouse, MS 251, the Digby commentary on the *Prognostics* is actually attributed to Bartholomaeus' student Petrus Musandinus, to whom some of Bartholomaeus' commentaries in the manuscript Winchester, Winchester College, MS 24 are ascribed (34).

(34) KRISTELLER, note 3, pp. 77-79; on Winchester, Winchester College MS 24, see *ibid.* pp. 59-60.

The text of the Digby commentary on Theophilus also bears some striking similarities to Bartholomaeus, but its resemblance to the Chartres commentary is closer. In fact, the Chartres and Digby commentaries are much closer to each other than either is to Bartholomaeus, though entire sections of all three texts match almost verbatim (35). They also share many structural features; for example, they raise the same *quaestiones*. But there are significant differences as well. Where Chartres prefers to use the text of Theophilus as a spring-board for more independent commentary, Digby sticks much more closely to the lemmata. The resemblances among the three are especially evident on the «glossing» level, i.e. when dealing with the specifics of Theophilus' text. On the «commentary» level, i.e. when jumping off from the text to dilate on a point, the three commentaries are more independent, and in some cases, widely divergent. This suggests that a common body of *glosses* on Theophilus lies behind all three texts, and that it was on the basis of these foundational glosses that each author built up his own *commentary*.

My hypothesis that the Chartres and Digby commentaries are related to, but not derived one from the other, diverges from the conclusions drawn by Mark Jordan from his extensive work on the Chartres and Digby Johannitus commentaries. In the case of the Johannitus commentary, Jordan argues that Chartres is a «teaching summary» of Digby, because Digby contains everything found in Chartres, but not *vice versa*, and because Chartres seems to be a simplified, pared-down rendition of Digby (36). That this is far from being true of the Theophilus commentary will be made evident in what follows. Which of us is correct must be left to the judgement of other scholars; but it is not impossible that we are both right, in which case we are faced with the prospect that not all the commentaries grouped in the Chartres and Digby collections are by the same author, or from the same milieu. Evidently, the way forward is to compare the contents of the different commentaries *within* each group,

(35) The Maurus commentary is the odd man out. Maurus does not seem to be using the same text of Theophilus as the other three, and the «foundational glosses» which I posit underlay the Chartres, Digby and Bartholomaeus glosses (see below) are absent in Maurus.

(36) JORDAN, note 1, pp. 43, 45-53; see also JORDAN, note 3.

as well as *between* groups—a task which clearly ranks high on the agenda of future *Articella* research.

The «foundational glosses» which I posit underly the Chartres, Digby and Bartholomaeus glosses all make use of Constantine the African's corpus of medical writings, particularly his translation of Isaac Judaeus, the *Pantegni*, and in the case of the Chartres and Digby commentaries at least, probably also the *Viaticum* (37). Above all, the three commentaries bear the unmistakable signs of the new collective and curricular medical teaching: a strong interest in theory, especially in aetiology and humoral physiology; a marked taste for schematization, and for pungent and aphoristic summaries; an interest in *quaestiones* raised by the text; and a concern, albeit tacit, to relate Theophilus to the other elements of the *Articella*, especially Johannitius.

This strong resemblance justifies the following method for this paper. Because I want to examine in some detail the strategies for interpreting Theophilus—and interpreting uroscopy itself—I shall concentrate here on the Chartres commentary, and add a few remarks of a comparative nature on the Digby text. I shall also confine myself to five sections of Theophilus' text which offer the richest lode of material reflecting the commentator's sources, approaches and ideas. These are: (1) the prologue, including the commentator's *accessus*, because it defends uroscopy's claim to be considered a *scientia*; (2) the account of how the

(37) Chartres and Digby cite only Isaac Judaeus directly, but Bartholomaeus also quotes directly from the *Pantegni*. However, there is some fairly solid evidence that Chartres and Digby used the *Pantegni* and the *Viaticum*, which will be discussed below. The Theophilus commentaries show none of the influence of Nemesius which Mark Jordan found to be so prominent in the Chartres and Digby Johannitius commentaries (note 1, p. 49). However, I am inclined to accept Jordan's conclusion that these earliest commentaries are Salernitan products. An alternative thesis, that the *Articella* was assembled and its earliest commentaries composed in northern France, has not received much support: see MORPURGO, Piero. *I commentari salernitani all'Articella*. In: Monkika Asztalos, John E. Murdoch; Ilkka Niiniluoto (eds.), *Knowledge and the Sciences in Medieval Philosophy. Proceedings of the Eighth International Congress of Medieval Philosophy, Helsinki, 24-29 August 1987*, Helsinki, Publications of Luther-Agricola Society, series B 19, 1990, vol. 2, pp. 97-105, and MORPURGO, Piero. *Filosofia della natura nella Schola Salernitana del secolo XII*, Bologna, Cooperativa libraria universitaria editrice Bologna, 1990.

body makes urine, because it establishes the connexion of uroscopy to physiology and anatomy which justified that claim; (3) the discussion of «natural» urine, because it re-writes uroscopy in terms of humoral theory; (4) the pathological significance of urine which is thin and white, because it illustrates how the Chartres commentator defines diagnosis as a kind of experimental physiology, rather than (in Guldolf Keil's phrase) a form of «medical divination» (38); and finally (5) the discussion of the spectrum of colours found in urine, because it marks, I believe, the initial stages of reflection on the problem of the elements.

6. THEOPHILUS IN THE CLASSROOM

6.1. *The scientia and doctrina of urine: the accessus*

All of the twelfth-century commentaries on Theophilus begin with that hoary classroom technique, the *accessus*. However, each frames the *accessus* somewhat differently. To put the Chartres commentary's *accessus* into perspective, I have drawn up a table comparing its *accessus* to those of the Digby commentary, and the commentaries of Bartholomaeus and Maurus of Salerno. High hopes have been pinned on the *accessus* as a clue to the origin of these commentaries (39), but in this case, the *accessus* shows the complex interconnexion of these texts; it does not establish any linear relationship (40).

The Chartres family has been distinguished from the Digby group on the grounds that Chartres has a six-part *accessus*, while Digby uses seven categories (41). However, this may be a distinction without a

(38) KEIL, note 5, 14-15.

(39) Especially by MORPURGO, note 37 (1987), pp. 100-102. For critique of his approach, see JORDAN, note 1, pp. 47-48; cf. JACQUART, Danielle. Aristotelian Thought in Salerno. In: Peter Dronke (ed.), *A History of Twelfth Century Western Philosophy*, Cambridge, Cambridge University Press, 1988, p. 414, note 29.

(40) The *accessus* scheme adopted by all these commentaries is broadly modelled on that used by Boethius in his *accessus* to the *Isagoge* of Porphyry: see MINNIS, Alastair J. *The Medieval Theory of Authorship*, London, Scholar Press, 1984, pp. 18-28.

(41) BURNETT, note 28, pp. 129-130.

TABLA I

Comparison of accessus in Chartres, Digby, Bartholomew and Maurus

<i>Chartres</i>	<i>Digby</i>	<i>Bartholomaeus</i>	<i>Maurus</i>
<i>London BL Royal 8.C.IV fol. 163r</i>	<i>Bodleian, Digby 108 fol. 76r</i>	<i>Main Text: Winchester 24 fol. 157v Variant: Erfurt Amplonian 4E fol. 58v</i>	<i>Paris, B.N. lat. 18449 fol. 145r.</i>
materia	materia	intentio	materia
modus tractandi	intentio	causa intentionis (variant: operis)	intentio
intentio	causa intentionis	utilitas	intentionis causa
utilitas	utilitas	ad quem partem philosophie spectet	utilitas
cui parti philosophie supponatur	cui parti philosophie supponatur	quo genere doctrine utatur	suppositio
causa (titulus)	divisio titulus	divisio titulus	ordo tractandi titulus

difference. The Chartres commentator explicitly says that he will consider six categories, but in fact he adds a seventh, the *titulus*. Digby does not formally declare how many categories constitute its *accessus*. Chartres' emphasis on the number six may have been influenced by the *Pantegni*, which presents a six-category *accessus* (42). However, neither Chartres nor any of the other commentaries follow the *Pantegni's* form of *accessus*: intention, utility, title, part of doctrine to which it pertains, name of author, and divisions. It should be noted that Chartres and Digby share the same terminology (except for *modus tractandi/diuisio*), but the order of categories is not the same. Maurus and Digby, on the other hand, employ the identical categories, in the same order, but again with some

(42) CONSTANTINE. *Pantegni*, Theorica 1.2, Basel, 1539, pp. 1-2. Haly Abbas starts with 8, which Constantine reduces to 6: see JACQUART, Danielle. Le sens donné par Constantin l'Africain à son oeuvre: les chapitres introductifs en arabe et en latin. In: Charles Burnett; Danielle Jacquart (eds.), note 2, p. 79. It should be noted that the Chartres Theophilus commentary uses the same *accessus* format as the Chartres Johannitius commentary: JORDAN, note 1, p. 46.

small variations of terminology. In particular, Maurus, like Chartres, eschews *diuisio* in favour of *ordo tractandi* (Chartres: *modus tractandi*). Bartholomaeus uses *diuisio*, but comments that it is in fact inappropriate, as Theophilus' treatise has no divisions, though one can speak of an *ordo* (43). This may be why Maurus does not use the term *diuisio*, and actually substitutes Bartholomaeus' term *ordo*. But what about Chartres? Did the Chartres commentator read Bartholomaeus, or vice versa? Bartholomaeus complains that pedants think that every book has to have a *diuisio* because it says so in the *Pantegni*. If the Chartres commentator was aware of the *Pantegni*, this would furnish some evidence of his critical and independent attitude. Nonetheless, this tangled web should alert us to the pitfalls of attempting to use *accessus* as a sort of genetic marker for the affiliation of commentaries.

The Chartres, Digby and Maurus *accessus* also include the category *materia*, which is something of an oddity, in that it usually belongs to the extrinsic or subject *accessus*, not the *accessus circa librum*. This strikes me as quite deliberate. The unglamorous and technical subject of uroscopy needed some explaining if it was to be accepted as *doctrina*, something that deserved to be taught from texts, in schools. We shall see in a moment how the Chartres commentator handled this (44).

(43) «Que libri diuisio. in rei ueritate nulla est. quidam tamen diuisionem assi<g>nante conantur. decepti ex quibusdam uerbis que in pantegni habentur. dicitur enim ibi VII [*sic*] esse inquirenda in principiis librorum. Inter que enumeratur libri diuisio. Vnde in omnibus libris diuisionem assignare uolunt. Nos autem concedimus ubique inquirendum esse. sed non ubique assignandum. ubi scilicet nulla est. hec autem penitus nulla est quare assignanda \non/ est. Sed loco diuisionis potest inquiri ordo. qui talis est..». (Erfurt, Stadbibliothek, MS Amploniana, Q 174 fol. 58vb).

(44) One might add as well that Maurus abbreviates Chartres/Digby's «cui parti philosophie supponatur» to the terser «suppositio» (Paris, Bibliothèque nationale, MS lat. 18499, fol. 145rb), but Bartholomaeus puts it very differently: «ad quem partem philosophie spectet» (Erfurt, Stadbibliothek, MS Amploniana, Q 174, fol. 58vb). This phrase is found verbatim in Gundissalinus, *De diuisione philosophie* [MORPURGO, note 37 (1987), p. 100], whose formula for *accessus circa librum* also uses *intentio*, *utilitas*, *titulus* and *distinctio libri*. Gundissalinus seems to have done most of his writing in the 1150s, i.e. about the same time as, or slightly earlier than Bartholomaeus, but how the two men came to share identical terminology for the *accessus* is not clear.

The Chartres commentary on Theophilus begins by plunging directly into the *accessus*. The subject matter of Theophilus' book is urine, its colour and its sediment. The manner in which Theophilus treats the subject (says the commentator) is first by defining urine, and then describing it. Theophilus distinguishes urines according to substance (thin, thick, and in-between), and according to their colours, showing how one colour arises from another (as we shall see, this is a particularly Chartrian touch). Then he shows (*ostendit*) which kinds of substance can be combined with which colours. Finally, he defines and distinguishes between different kinds of sediment (*hypostasis*). The Chartres commentator's choice of verbs is telling, for definition, description, distinction, demonstration are the methods of a *scientia*, and they elevate uroscopy to a higher, «doctrinal» plane.

The Chartres commentator also characterizes Theophilus' intention in markedly philosophical terms: it is to discuss the essence [*essentia*] and formation of urine, and to demonstrate its variations (45). Moreover, the utility of the work is also conceived in a theoretical way: it provides secure knowledge about health, sickness, and the neutral state (which is a faint echo of Theophilus, though probably derived from Johannitius), and the causes of these things (which is not in Theophilus) (46). The term «cause» (*causa*) defines uroscopy as an adjunct of aetiology.

(45) L fol. 163ra: «Intentio uero theophili est essentiam urinalis effusionis cum loco generationis ipsius et formationis. ostendere. eiusdemque differentias in substantia. colore. et sedimine. cum suis significationibus. demonstrare».

(46) L fol. 163ra: «Vtilitas uero est firma cognitio sanitatis. egritudinis. et neutralitatis. cum causis eorum». Cf. Theophilus: «Nam ypocras de urinis exponens. et aliud alibi in tractatibus suis sparsim tangens. et genera. et species. et differentias earum. et ex eis cognitiones et precognitiones. futuris partium dispositionibus preter naturam et in sanis corporibus. et in acutis egritudinibus minus habentem doctrinam relinquit». (KEIL, note 5, p. 97). Johannitius: Theoretical medicine is divided into three parts «i<d est> in contemplationem rerum naturalium et non naturalium et earum, quae sunt contra naturam, ex quibus sanitatis, aegritudinis et neutralitatis scientia procedit..». [MAURACH, Gregor (ed.). *Isagoge ad Technē Galieni*. *Sudhoffs Archiv*, 1978, 62, p. 151]. For problems connected with this admittedly working edition, see JORDAN, note 3, pp. 124-125, note 16, and FISCHER, Klaus-Dieter. *Verbesserung zur Isagoge des Johannitius*. *Sudhoffs Archiv*, 1983, 67, 223-234.

Significantly, the commentator does not mention that inspection of urine might serve prognostication, or indeed, any clinical purpose whatsoever. Not surprisingly, the part of philosophy to which this book pertains is *physica*. The commentator is rather emphatic that uroscopy is an exclusively theoretical science in which «contemplation alone operates» (47). The unnamed source of this schema is Johannitius, who divides medicine into theory and practice, and defines theory as «contemplatio naturalium» (48). The cause of Theophilus' work is the prolixity and lack of order in the works of Hippocrates, Galen, and Magnus: in short, it was composed in the interests of *doctrina*.

Theophilus says that urine reveals «obscure things» (*obscuras res*). The commentator interprets these «obscure things» not as the uncertain outcomes of disease, or even as the diseases themselves, but rather as the internal organs (especially the liver) and the digestive virtue which makes blood. He adds that because the followers of Galen, Magnus and the others did not know urines, they consequently did not know the internal organs (49). In short, for the Chartres commentator, uroscopy is primarily interesting as a key to anatomy and physiology (50).

(47) L: fol. 163ra: «physice supponitur tantum per theoricam. In hac enim scientia sola contemplatio operatur». Cf. parallel passage in Digby (note 97).

(48) See note 46 above; however, it should be noted that Maurach did not use the two earliest manuscripts of the *Isagoge*, namely Paris, Bibliothèque nationale, MS nouv. acq. lat. 1628 and Monte Cassino, MS 225 (both s. XI, in Beneventan script), and which both read «in contemplationem naturalium ex quibus sanitatis..»: see NEWTON, Francis. Constantine the African and Monte Cassino: New Elements and the Text of the *Isagoge*. In: Charles Burnett; Danielle Jacquart (eds.), note 2, p. 33, note 56 and figs. 1 (p. 43) and 2 (p. 4).

(49) L fol. 163rb: «*Obscuras res* id est in efficaces operationes. et obscuros *intellectus* id est inexplicabiles et falsos sunt. Vel habent obscuras res id est epar. et alia interiora que patiuntur sunt eis obscura. De obscuris uero habent obscuros intellectus. *Nam urinarum* et cetera. Vero quia non habent cognitionem urine. non habent cognitionem interiorem partium. quia si haberent cognitionem urine. et haberent cognitionem illarum partium».

(50) It is noteworthy that at this point the Erfurt version departs from the London version to dilate on the ability of urine to reveal *crasis*: «*Obscuras* id est graues uel maledicans. et res que paciuntur. ut caput. pulmo. stomachus. et *intellectus* id est quomodo debent intelligi patientes partes uel passure. et quid paciantur. et

6.2. *Physiological context: the production of urine*

After defining urine as «the filtrate of the blood» (*colamentum sanguinis*), Theophilus' treatise provides a brief anatomical account of how it is produced. When food is turned into blood in the liver, the lighter red bile rises to the top, and is taken up by the gall bladder through its duct positioned near the liver. The spleen bears off the earthy matter, the dregs of the blood so to speak, by its duct. A watery superfluity is left with the blood, so that it can pass through the branches of the chelic vein, and thence to the kidneys. There it is turned into urine, and transmitted to the bladder. If blood is clear and pure, its superfluity will be likewise. But if for some reason the operative virtue of the blood is impeded from carrying out its work, the urine will appear thin and white, or thick and white. These urines are the product of imperfect and crude digestion, whereas others are the superfluity of an overheated and adust blood.

The Chartres commentator finds this account inadequate, and proceeds to supplement it with an improved anatomical and physiological background, culled *extra librum* (51). This account stresses that the production of urine has an anatomical setting as well as a physiological context, which is exactly what was announced in his *accessus*. For his material, the commentator turns to the opening chapter of Isaac Judaeus' treatise on

quomodo. et unde. et ex quo tempore. Vnde subdicit. *Nam urinarum apta* id est congrua secundum tempus et passionem facit nos cognoscere. *non apparentes locos*. sicut epar infirmum. et splenem. et renes. et *quomodo dispositi sunt* loci id est quomodo diuerso modo positi sunt in sanitate uel in egritudine uel neutro. Et hoc exponit quod sequitur. *Et secundum qualem crasim* id est habitudinem uel temperanciam. Ea enim confirmacio est predictorum locorum. Temperancia dico aut secundum calidum et humidum. uel secundum cetera. que distemperanciam nature uel detrimenta paciuntur. *Extra naturam* id est in hiis que sunt non naturales. *Preter naturam* id est nondum infirmati sed egrotare parati. et secundum qualem cras[s]im et ideo addit. *Eius enim que sanguinem operatur*. hoc addit ut ostendat cuius professionis sit locus ubi nascitur id est epar et a quo discernitur id est in senibus». (fol. 1va)

- (51) L fol. 163rb: «Premisso prologo agit de urina per diffinitionem. Sed priusquam ponamus illam diffinitionem quedam sunt notanda extra librum ut melius pateant illa que sunt in libro».

urines, as well as an as yet unidentified anatomical source with a strongly teleological bias, redolent of the *Second Salernitan Demonstration* (52).

After being digested, the food passes into the *duodenum*, so called because it is twelve fingers in length. It then goes to the *jejunum*, which is so called because it takes nothing for itself. From the jejunum, the liver attracts the liquid part to itself through the mesenteric veins, which are like leeches (a rather disturbing analogy, not found in Isaac). This phase of the process gives the commentator a chance to digress on the phenomenon of attraction in general. All attraction, he says, is caused either by heat (like oil in a lamp) or by an instrument (as air is moved in the arteries, or water in canals, or iron by a magnet), an analogy drawn from the discussion of digestive action in *Pantegni Theorica* 4.2 (53).

The Chartres commentator's anatomical excursus in fact exceeds considerably the requirements for any account of the production of urine, especially in its lengthy and circumstantial description of the various branches of the portal vein and their functions. After dilating on these, and on the roles of the stomach, gall bladder and spleen, he returns to the theme of the formation of urine. It is in the portal vein,

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- (52) Jordan has argued that the Digby commentator and the author of the *Second Salernitan Demonstration* are one and the same person on the basis of a strong resemblance between their respective discussions of vision: JORDAN, note 1, pp. 48-49. However, it should be noted that while the author of the *Second Salernitan Demonstration* claims to have composed commentaries on Johannitius, the *Aphorisms*, and Philaretus, there is no mention of Theophilus. Moreover, Digby's discussion of the bladder (London, British Library, MS Royal 8.C.IV fol. 179ra) mentions the two holes through which urine enters, and the evidence provided by animal dissection (compare to Chartres text cited in note 55 below). This passage is not found in the *Second Salernitan Demonstration*: see ed. in RENZI, Salvatore de. *Collectio salernitana*, Napoli, Tipografia del Filiale-Sebezio, 1853, vol. 2, p. 398. Finally, both Chartres and Digby used anatomical terms not found in the *Second Salernitan Demonstration*, e.g. *uena chilis*.
- (53) Basel, 1539, p. 82. Cf. LAWN, Brian (ed.). *The Prose Salernitan Questions*, Auctores Britannici medii aevi 5, London, Oxford University Press for the British Academy, 1979, B 47 (p. 23), where the analogies of the canal and the wick are used in the context of a discussion of magnetic attraction. Lawn points out, however, that Urso of Calabria used the same material in his commentary on Hippocrates' *Aphorisms*. This digression on attraction is not found in the Digby commentary.

he says, that the food first receives the subtle texture and red colour of blood. The colour is actually imparted to the blood by the red liver itself (54). This is a rather interesting idea, not only because Theophilus nowhere explains why blood should be red, but because the Chartres commentator is obsessed with the issue of how things in general, and urine in particular, actually change colour. Here he seems to suggest (although it is not explicit) that physical contact with the red liver dyes to blood red. More on this subject will follow later.

After the body members have extracted the nutriment from the blood, the remaining watery liquor descends by two branches of the *vena chilis* into the kidneys. The urine thus formed in the kidneys descends to the bladder. There are two openings in the bladder: a small one on top by which it is filled, and a larger one below by which it is emptied. Animal dissection however does not show the smaller opening. Why? Because it is constricted by the cold, like the pores and the openings of nerves (55).

Now at last, the commentator feels that the stage has been adequately set, and he can actually turn to Theophilus' words. But those very opening words—that urine is the filtrate of the blood—immediately provoke a *quaestio*. Is it a filtrate of blood alone, or of blood and the other humours? The inspiration for this *quaestio* is Isaac Judaeus, who says that urine is the filtrate of all the humours (56). The commentator provides two solutions. First, red bile and black bile, being by nature dry, cannot flow. Therefore urine can only be the filtrate of blood and

(54) L fol. 163va: «In hac autem porta sublimitas ciborum primum recipit modum et colorem sanguinis. quia cum ab epate ibi decoquitur. in suum colorem conuertit».

(55) L fol. 163va-b: «Sunt autem in uesica duo foramina. unum superius et paruum quo impletur uesica. alterum inferius. et magis qua euacuatur. Paruum tamen animali occiso non apparet. Clauditur enim per restrictionem frigoris sicut pori. et foramina neruorum». As mentioned above (note 52), this information is not from the *Second Salernitan Demonstration*, or any of the the other texts identified and translated by CORNER, George W. *Anatomical Texts of the Earlier Middle Ages*, Washington DC, Carnegie Institute, 1927, nor does it derive from *Pantegni Theorica* 3.33. The Digby commentary mentions *two* small openings through which the bladder is filled, but not the opening by which it is emptied.

(56) FONTANA, note 21, p. 144.

phlegm. Nonetheless, we may as well say that urine is the filtrate of blood alone, because blood is superior in dignity and quantity. Alternatively, urine is said to be the filtrate of blood because, although all the humours are formed in the liver, they do not each appear under a separate and distinct form, but all mixed up together, and this mixture appears as blood, because the substance of the liver is a bloody colour, and it is this which imparts a uniform bloody colour to the whole mass (57). It is interesting to observe that the commentator's *quaestiones* have already gone beyond the open-ended mode of the *Salernitan Questions*, and are weighing the opinions of various authorities, albeit unnamed authorities (58).

Theophilus' discussion of the passage of urine from liver to bladder raises a second *quaestio*: why do the kidneys, although they are close to the bladder, not receive the urine through separate vessels, as do the gall bladder and spleen? The commentator offers a functional explanation: if the urine were drawn off directly to the kidneys, the capillary veins would burst, or become completely blocked by the thick blood, and the posterior members would lack nutriment. Nature has made the capillary veins so narrow that only the watery substance of phlegm and blood can pass through them. But his curiosity is not entirely satisfied: why has Nature made these veins so small? His answer is interesting and original: the aforementioned posterior members, being bony, do not need as much blood as do the fleshy members and hence they can attract nourishment even from these tiny veins (59).

(57) L, fol. 163vb: «Vel ideo urina dicitur coleratura sanguinis. quia licet in epate omnes humores formantur non tamen unusquisque in suam singularem formam determinatur sed confuse ut illa tota collectio sub sanguine appareat quia et substantia epatis talis coloris est unde tota illa massa quasi sanguinea apparet».

(58) In the case of the Johannitius commentary, the presence of *quaestiones*, in the view of Mark Jordan, distinguishes the Digby from the Chartres commentary (JORDAN, note 3, p. 135; note 1, pp. 49-53). Both the Chartres and Digby commentaries on Theophilus contain *quaestiones*.

(59) L 163vb-164ra: «Hic facit quendam questionem quare similiter lumbi non accipiunt urinam per proprios meatus cum sint prope epar. sicuti splen et fel. propria suscipiunt. et dicit quia prouida natura hoc fecit. Si enim esset ibi ampla uia per quam urina ad renes descenderet. capillares uene a sanguine penetrande. uel eius grossicie rumperetur. uel omnino clauderetur. et sic nutrimentum deficeret

The Chartres commentator is likewise not satisfied with Theophilus' bald statements about the qualities of urine, because they do not explain *why* some urines are thick or thin, white or red. So he fills in the gaps, with an account based on the action of heat. If the watery nutriment on arriving in the liver does not meet with heat, it will not change colour, and its substance will be thin and white. This is a rather different explanation for why blood is red than the one offered earlier, namely contact with the liver. The commentator may imagine that the liver will only impart its dye to the blood by heating it. In any event, it is the universal property of watery substances, in the absence of heat, to be thin and white. Therefore all thin, white urine signifies indigestion (60).

6.3. *The state of health: natural urine*

One of the most striking innovations of Theophilus' treatise was its attention to what he called «natural urine» or urine in the state of health. This is a symptom of Theophilus' orientation towards diagnosis in the more «philosophical» sense of the term, for by definition healthy urine does not prognosticate anything, and whatever it «diagnoses», it is not a disease.

Theophilus cites Hippocrates (*Prognostics* 12) to the effect that good urine is one which has a sediment which is white, uniform (*planam*) and even (*equalem*), a substance neither thin nor thick, and an appropriate colour. The way Theophilus handles this quotation from Hippocrates is

posterioribus membris. Ideo autem illas capillares uenas ita strictas natura constituit. a ramosa uena ad quilin distinctas nisi esse<t> transitus aquosi flegmatis et sanguinis. ne si ample esset posteriora membra plus quam necesse esset attraherunt. Cum enim ossosa sunt. non tamen indigent nutrimento sanguinis quantum carnososa. Ideo rotunde sunt uene ille. quia melius potest omnis transire per paruum rotundum quam per triangulum».

- (60) L fol. 164ra: «*Propter hoc igitur*. Quandoque urina est colamentum sanguinis ergo propter hoc aliquando apparet subtilis et est omnis urina alba. siue sit spissa. siue sit clara. sic genereat indigestionem. Si enim aquositas in ieiuno intestino ad epar tracta. non inuenerit calorem. mutantem colorem uel substantia<m> eri<t> tenuis et alba. Aquosorum enim proprium est nisi calore ignis inuertentur esse tenua et alba. Ita igitur omnis urina tenuis et alba indigestionem significat».

telling, for Hippocrates is in fact not discussing the urine of healthy people; rather he is describing the quality of urine in fever patients who are likely to make a full and swift recovery. Theophilus has in fact rewritten a clinical prognosis as a physiological axiom (61).

The Chartres commentator introduces the subject of natural urine in a matter-of-fact way: since urine varies so much, it is best to start from what is natural. But he is clearly fascinated with the problems posed by the concept of «natural». Theophilus says that any departure from the Hippocratic norm exceeds the bounds of nature and is therefore pathological, but the Chartres commentator disagrees. Thin urine does not *ipso facto* indicate disease: for example, a healthy young man who drinks a lot will pass out much of this beverage undigested, but that does not signify a defect in the heat of the liver (62). This sounds somewhat like the debates about the «latitude of health» found in later commentaries on Galen's *Ars* (63), but the Chartres commentator may not have had access to the *Ars*. However, one of the *Salernitan Questions* deals with exactly this problem. Why do healthy people with plenty of natural heat produce colourless urine? The answer is that when healthy people drink, input equals output (64). Since this same explanation turns up in Maurus of Salerno's *Regulae urinarum* (65), it may suggest other sources apart from my hypothetical «foundational glosses» for the commentary.

(61) «Vrina bona est sicut dicit ypocras. albam et planam et equalem ypostasim habens; manifestum quidem est quum consequente substantia moderata. et colore oportuno quod sit diffinitio diffiniens perfecta». KEIL, note 5, p. 99. Cf. HIPPOCRATES. *Pronostica* 2: «Urine is best when the sediment is white, smooth and even for the whole period of the illness until the crisis, for it indicates a short sickness and a sure recovery» (note 6, p. 25).

(62) L fol. 164ra: «*Preter naturam* dicit. non contra que licet hec [hac] non tamen statim significat egritudinem. sed aliquando significat nimiam receptionem epatis. indigestam urinam facientis quod est uidendum in iuene sano nimium sitente propter aliqua occasione qui si auide biberit. epar inde multum suscipit. et non ualens digere. indigestum emittit non tamen significat defectionem caloris epatis».

(63) Cf. OTTOSSON, note 1, chp. 4.

(64) LAWN, note 53, B320 (p. 151).

(65) RENZI, note 52, vol. 3 (1854), p. 34.

Despite its intrinsic interest, this chapter of Theophilus was, from the Chartres commentator's perspective, pedagogically flawed. The Hippocratic definition of natural urine is grounded in the condition of the sediment. But Theophilus puts off discussing sediment until later in his treatise, and even there, does not furnish a physiological account of urine sediments. The Chartres commentator, as usual, wants to know *why* white sediment is a sign of good urine. This demands a full-dress explanation of sediment itself.

Sediment is the product of the third digestion which takes place in all the members. The members of the body attract blood from the liver through the veins for their nutrition, and convert it into their own substance. Since all the members are innately white—we know this because any flesh drained of blood looks white—they convert the blood into something white (66). Once again, we encounter the Chartres commentator's fascination with the problem of coloration. He imagines this dealbation of the blood as a process analogous to the original pigmentation of the blood by the liver; it happens by physical contact, and the commentator possibly implies as well that the heat of the third decoction mediates this transformation, just as that of the second decoction was responsible for making the blood red. Isaac Judaeus' chapter on the white colour of natural *hypostasis* provides an interesting contrast. There, the white colour of the sediment is also the result of the perfect digestive action of the members. But Isaac's logic is that coction must result in change. Since the second digestion has already changed the blood by making it red, the third digestion must change it by making it white (no other colours seem possible). This is confirmed by the visible products of the third digestion, namely breast milk and sperm, as well as the digestion of apostemes which produces white pus (67). Notice that Isaac

(66) L fol. 164rb: «Ypostasis enim habet fieri in tertia decoctione que fit in omnibus membris. Cum enim singula membra attrahant sanguinem ab epate per uenas ad nutrimentum sui. decurrente sanguine per uenas in membra uicina. per poros uenarum sanguinem sibi attrahunt. illumque in suam substantiam mutant. et colorem id est albedinem. Membra enim alba sunt. Quod potest uideri si sanguis exceptatur. tunc enim carnes albe apparent. Sicut enim epar in sui colorem id est ruborem mutat humiditatem attractam. et ita et membra sanguinem attractum mutant in sui colorem id est albedinem. et sibi incorporant».

(67) FONTANA, note 21, p. 201.

nowhere states that the members are innately white, nor does he imagine the members transforming the blood into something similar to themselves. For the Chartres commentator, on the other hand, the white sediment is a sign that the members are healthy. He says that when the members transform even the dregs of blood into their own colour in the third decoction, it signifies that they are very strong (68).

The proper precipitation of the sediment in the body is reflected by the behaviour of the sediment in the urine flask: it should settle to the bottom in an even way, and remain there. Failure to settle to the bottom denotes «windiness» and consequently, undigested humours. What is not in Theophilus or Isaac is the Chartres commentator's observation that sediment settles in the flask because it is dregs (*fex*) and therefore heavy and therefore naturally goes down. If it does not, it is because it is being unnaturally borne up by «windiness» (69). Isaac Judaeus says that the sediment should seek its «natural place» at the bottom of the flask (70), but does not relate it to the abstract idea of heaviness and lightness. Chartres' interest in issues of natural philosophy are very evident here.

Theophilus claims that time is a factor in the analysis of urines, but unlike colour or sediment, time gets little attention in *De urinis*. Indeed, it is not always entirely clear what Theophilus means by time. Chartres concludes that what is at issue is the time at which the urine sample is collected. For help here, he turns to Isaac Judaeus, this time to Isaac's lengthy chapter on the technique of urine inspection (71). In this chapter, Isaac also gives very detailed instructions on choosing the correct light source, rotating the urine flask, moving it up and down etc.

(68) L fol. 164rb: «Cum enim membra in tertia decoctione etiam fecem sanguinis mutant in colorem sibi similem. ualida significatur».

(69) L fol. 164rb: «Hic uero ypostasis fundum debet petere naturaliter. Est enim grauis. quia est fex sanguinis tertia decoctione. uel iam quasi membris incorporari cepit quorum grauium est semper infima petere. Si uero in medio urine [MS: urina] appareat. significat uentositatem dominari. que ad fundum residere non sinit sed sua uentositate sustentat. Si uero in sumo maiorem uentositatem».

(70) E.g. FONTANA, note 21, p. 209: «si extra naturam sui loci exeat..».

(71) FONTANA, note 21, pp. 152-154.

However, the Chartres commentator omits all this material. He is only interested in the timing of urine collection, because this alone relates to the physiological themes that are so important to him.

Isaac says that it is best to wait until the end of the night to collect urine because during the day, nature is intent upon external things. At night, she is no longer occupied with supervising the senses, and can devote herself to digestion. Hence, if we collect the urine too soon, we will err in our judgement of its state (72). The Erfurt recension of Chartres supplements Isaac with some interesting specifics. This third digestion is completed in 12 hours. We must not only not collect urine before this period has elapsed, but we should also be suspicious of urine collected after 12 hours. If we let her work overtime, Nature may accomplish in more than 12 hours what she would usually accomplish within 12 hours, and the urine will give a misleading appearance of being healthy (73). The manner in which the Chartres commentator has thought through the physiological implications of Isaac's instructions is quite remarkable.

6.4. *From semiotics to diagnosis: thin, white urine*

Theophilus now proceeds to show which substances match up with which colours, and to link substance and colour to conditions of health and disease. Because the colour white comes before other colours, and thin effusion precedes the other qualities, he deals first with the combination of white colour with thin substance. Thin, white urine signifies many things for Theophilus, and I shall list only a few here. If passed in large quantity, it signifies diabetes, which is due to a hot distemper of the loins, causing them to attract moisture to an excessive degree. In ephemeral

(72) FONTANA, note 21, pp. 151-152.

(73) A fol. 2ra: «Et *tempus etiam debet esse consequens* id est conueniens quando plena preesse digestio esse facta id est per XII horas .III. possit esse perfecta sicut appropinquante iam die. Que autem ante XII horas colligit<ur> etiam imperfecte temperatis [*recte*: temperata]. indigesta uidebitur. cum nondum tempus perfecte digestionis aduenit. Si autem post XII colligatur natura quod in XII horis facere non potest. postea fortasse faciet et illa uidebitur sana».

fevers it signifies «a diminution of the humour». It is also a sign of obstruction [*emphraxis*], for example in cases of nephritis, incipient quartan fever, and dropsy. When people experiencing pain in the neck, head and shoulders pass thin white urine, it heralds dizziness and fainting [*lipotomia*] (74).

The Chartres commentator's main objective in this section is to explain *why* what Theophilus says is true—why such conditions must of necessity lead to thin, white urine (which is something that Theophilus does not explain)—and to couch that explanation in terms of a fully humoral aetiology. To begin with, why does Theophilus say that thin, white urine «precedes all the others?» The Chartres master's explanation takes syllogistic form, of which he is quite self-conscious. The colour white signifies indigestion, and all the other colours digestion. But indigestion is prior to digestion, for that which is undigested can be digested and decocted; but that which is decocted cannot return to a raw state. Therefore the colour white is prior to the other colours. Or else it is prior because it takes on all the other colours, while the others do not take on whiteness (this will be the starting point of his analysis of the colours of urine in the next section) (75). Thin substance precedes the other substances because thinness signifies indigestion and thickness adustion. What is undigested precedes what is digested or burnt. Therefore, thin substance precedes moderate and thick substance. The London version of the commentary observes that the two syllogisms are analogous (76).

(74) KEIL, note 5, pp. 100-102.

(75) The source of this observation is Isaac Judaeus: FONTANA, note 21, p. 185.

(76) L fol. 164vb: «*Albus color precedit alios colores hoc modo. Albus color significat indigestionem. omnes uero alii digestionem. Indigestio uero prior est digestionem. Nam illud quod est indigestum. potest digeri et decoqui. Illud autem quod est decoctum. non reuertitur ad cruditatem. Ergo albus color prior est aliis coloribus. Vel ideo prior est quia suscipit omnes alios colores. alii uero non suscipiunt albedinem. Tenuis substantia precedit alias substantias. quia tenuitas significat indigestionem pinguedo adustionem. Prius est quod indigestum est quam quod [in] digestum uel [MS: in] combustum. Tenuis ergo substantia prior est mediocri et pingui. Locus a cetero in utroque sillogismo».*

The Chartres commentator also transforms Theophilus' bald equations of thin, white urine with certain diseases into elaborate pathographies, for which urine provides the demonstrative semiotic clue. For example, he fills in the logical steps in Theophilus' description of diabetes. Because it is the property of heat to attract, the overheated kidneys, as if parched with thirst, are always attracting to themselves watery substance from the liver, even though what they attract is undigested. Because decoction cannot take place in the kidneys, the moisture readily passes to the bladder, whence it exits as a flux of thin urine (77). This is a good illustration of the Chartres commentator's strategy. Theophilus' diagnosis is something of a «black box»: thin, white, abundant urine signifies diabetes, a disorder of excess heat, which attracts moisture. What the commentary does, is explain *why* the resulting urine will then be not only abundant (as one might naturally anticipate) but also thin and white: the moisture unnaturally drawn off from the liver is undigested, and the kidneys cannot digest it.

An even better example is furnished by the commentator's analysis of Theophilus' statement that white, thin and abundant urine in cases of ephemeral fever signifies that the fever is abating because the humours are being evacuated. Why should this abatement produce white, thin urine? The commentator answers that ephemeral fever comes from corrupt phlegm. If phlegm abounds in the urine, then it stands to reason that the sickness is being evacuated (78). Theophilus does not

(77) L fol. 164vb-165ra: «Vrina talis *multa* in quantitate. *similis* id est continua in tempore *significat diabetem* id est transitum urine frequentem; fit enim aliquando in renibus nimia distemperantia caloris propter nimium calorem. uel aliam causam. Quoniam uero caloris est attrahere renes quasi siticulosi semper sibi attrahunt aquositatem ab epate. attractam licet indigestam. epar a stomacho. stomachus ab exterioribus. Vbi quia non est locus decoctionis. conuenienter transit ad uesicam. Vnde fit tenuis fluxus urine». The source of this explanation has not been traced: it is very different from that put forward by Isaac Judaeus (FONTANA, note 21, p. 161) but matches on a number of points *Pantegni* Theorica 6.34, and even more so *Viaticum* 5.19, Lyons, 1515, fol. 163rb.

(78) L fol. 165ra: «Vrina et cetera. *Alba et tenuis et multa in febris amphimeris* id est cotidianis. *significat febrem* illam *deficere* propter *huiusmodi humores* qui euacuatur. Cum enim cotidiana habeat fieri ex flegmate. si flegma habundet in emissione urine egritudo necessario euacuatur».

say that ephemeral fevers are caused by corrupt phlegm; the commentator drew this information from Constantine (79).

6.5. *Theoretical re-framing of semiotics: the chromatic scale of urines*

Another of Theophilus' innovations was to present the colours of urine in the form a chromatic spectrum from light to dark, starting from white and its shades («milky white», «light grey» [*glaucus*], camel-hair grey [*carapos*]) and running through yellow (pale yellow [*subpallida*], «somewhat tawny» [*subruffus*], tawny [*ruffus*], reddish [*subrubeus*]), red [*rubeus*] and its variants (flame-red [*ypicotheron/iperitheron*], blood-red [*ericon*], wine-red [*inopos*], blue-grey *kianon* [=cyanon], «dusky» [*fuscus*]), green [*claron* or *cloron*] and charcoal-grey [*pelicinon/pelithinon*], to black. The notion of arranging the colours in such a spectrum is not found in Isaac, who deals with the colours of urine in apparently random order: white, black, green, grey, yellow, red, purple and pink.

The Chartres commentator is clearly impressed by Theophilus' spectrum. He is particularly taken by the idea that each colour is made from the colour that precedes it, beginning with white, which is the first amongst colours. It seems to suggest to him the notion that the humours which underlie and determine urine are not entities, but rather points on a spectrum. The commentator says that if choleric matter is added to white, the result is a colour which is white-ish [*subalbidus*]. If more of this same choleric matter is added, what eventuates is pale yellow [*subpallidus*]. If you add still more choleric matter, it becomes somewhat tawny [*subruffus*]. Then if more is added, it becomes tawny, and so forth. The image here of a painter beginning with white pigment, and progressively

(79) It should be noted that Johannitius distinguishes «ephemeral» and «cotidian» fevers: ephemeral fevers are seated «in animo», while fevers arising from corrupted humours are «putrid». Of these, cotidian fever is caused by morbid phlegm: MAURACH, note 46, p. 160. But it will be noted that the commentator equates *amphimeris* with *cotidianis*: so does Constantine in *Viaticum* 7.6, Lyons, 1519, fol. 168rb, and in *Pantegni Practica* 3.32, Lyons, 1519, fol. 90vb, but not in *Theorica* 8.4. Since the *Practica* of the *Pantegni* was assembled over some time, and no manuscript earlier than 1200 survives, it seems most likely that the commentator was using the *Viaticum*.

adding more and more red (80). The commentator seems to have picked up on an idea enunciated by Theophilus himself, who says that if white urine receives an *infectio* of red bile, it becomes *subpallida*. If it then receives *infectionem maiorem*, it becomes *pallida* (81). The word *infectio* was destined to become an important one for later Salernitan commentators on the *Isagoge* such as Bartholomaeus and Maurus, for whom it came to denote the process by which one element, coming into physical contact with another, exchanges qualities with it. Danielle Jacquart has documented the use of *infectio* in this context. She argues that *infectio* represented an experiment in solving the problem of how the elements, qualities and humours are altered and combined—a problem posed by the *Isagoge* of Johannitius. This problem eventually incited the Salernitans to explore the potential of Aristotelian natural philosophy (82). I would venture to

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- (80) L fol. 165rb-165va: «Nota in isto tractatu IIIor genera colorum constitui. albi. scilicet. rubicundi. uiridis. et nigri. et latitudines eorum id est species. quomodo unaquaque ex alia procreetur ascendendo ab albo. qui est primus usque ad alios colores. *Est igitur* et cetera. IIII sunt principales colores. albus. rubicundus. uiridis. niger. Quorum unusquisque habet plures species. et unus ex alio habet fieri. Verbi gratia. Si albedini addatur colericus color subalbidus inde est principaliter. tamen ab albedine efficitur. ut decoctio semicrude carnis posite super carbones. que primum incipit pallescere. Subpallidus est albus. cui si plus parum adhuc colere addatur. efficitur pallidus. Si adhuc plus. fit subrufus id est subcitrinus. qui assimilatur auro ueniente de celtica regione. unde ut purus aurum solet uenire. deinde si plus addatur. rufus efficitur id est citrinus sicut orizon aurum uel eurizon. Eurizon bona radix interpretatur per quam bonum aurum accipimus. Deinde si plus fit subrubeum principante quidem rubore similis guico id est croco ortolano. deinde rubeum sicut crocus uerus orientalis. deinde epirecon [*recte*: yperitheron] fit id est subrubicundum factum ad aquoso sanguine. quasi splendor id est rubor. si superueniret. quod etiam uocatur *finicon* id est dactilicon. quasi sunt dactili. deinde uero si *euriton* id est rubicundus sicut ipse sanguis *sine dolo* id est adustione. Deinde fit *inopos* cum aliquid ingreditis iungitur rubicunditati. *ut uinum nigrum* id est nigredo aliquantulum commiscetur rubori. aut fit ut uinum profundius in nigretudinem. Si plus nigredinis ei addatur. fit purpureus sicut colore epatis. Deinde si plus nigredinis addatur. fit kianon colore ut garus».
- (81) «Si uero infectionem recipiat aliquam fellis alba urina secundum primam quidem rationem subpallida fit. ut decoctio semicrudis carnis. Si uero permanet tempore aliquo decoctio. infectionem maiorem faciens perficit pallidum colorem». (KEIL, note 5, p. 102).
- (82) JACQUART, note 39, p. 419.

guess that Bartholomaeus chose this word (and Maurus its synonym *contagio*) because it was used by Theophilus to designate the gradual transformation of white urine by red bile (83). They simply generalized the specific meaning given to it in *De urinis*. Indeed, in the copy of the Digby commentary preserved in Royal 8.C.IV, *infectio* is used to describe the alteration of blood by the presence of other humours, which will be visible in the urine (84). Perhaps it was this broader issue which motivated the Chartres commentator's marked interest in how things change colour.

Finally, the Chartres commentator returns to Theophilus' statement that time is an important factor in judging urines. Time, he concludes, must actually affect the colour and substance of the urine, not just the sediment. Therefore more is involved than just the time of collection. The Chartres commentator concludes that the age of the patient must also be a factor. Here again he turns to Isaac Judaeus, to borrow the first of Isaac's chapters on the effect of the «non-naturals» on the quality of urine. Adolescents should have a well-coloured urine, for natural heat prevails in them, but because they eat all the time, and too much, their urine appears turbid and not well-cooked. In young men the urine is thin and tawny because of an abundance of choler, and in mature men, it is thin and white, because mature men are melancholic. Here the commentator departs from Isaac, who says that the urine of mature men is citrine. Instead, he picks up Johannitius' schema linking the humours to the stages of the life cycle. In fact the commentator uses Johannitius' and not Isaac's terms for the ages of man (85). According

(83) Isaac enunciates a somewhat similar idea (FONTANA, note 21, pp. 170-171) where he describes colours as compounds of other colours (e.g. purple is a combination of black and red), and the Chartres commentator has certainly read Isaac, because he uses Isaac's terms for some of the colours, e.g. *rubicundus* and *lividus*. But Isaac does not organize his colours as a spectrum.

(84) Digby commentary, L fol. 179rb: «Si queratur quomodo \ergo/ aliorum humorum intensio \\aliter infectio//. per urinam cognoscitur. cum eorum non sit superfluitas? R<espondeo>. intentione \\uel infectione// illorum hic sanguis uariatur. quia aliquando uariatur. qui aliquando colericus. aliquando flegmaticus. aliquando melancholicus efficitur. quam sanguinis infectionem. uel alternationem per urinam. que ipsius est superfluitas cognosci oportet».

(85) A fol. 2va: «Item uidendum est de tempore. et primum secundum etates. Adolescentia enim bene coloratam debet habere urinam. Naturalis enim calor in illis perualet.

to the *Isagoge*, melancholy is associated with the mature years (86). Melancholy is cold and dry, so melancholic urine is white and thin. The Chartres commentator goes on to link the colours of urines to the seasons when the corresponding humour dominates. This is not found in Isaac, but may be a development of Johannitius' schema linking elemental qualities, ages of life, and seasons (87).

7. COMPARISON WITH THE DIGBY COMMENTARY

The Chartres commentary opens a window onto a school where medicine is studied from an aggressively theoretical standpoint. The Digby commentary, however, reveals a rather different world.

On the whole, the Digby commentary is not as tightly organized and crisply argued as Chartres, and is rather more repetitious. Though every bit as committed as Chartres to establishing uroscopy on a rigorously humoral basis, Digby lacks Chartres' single-minded drive for logic and scientific coherence. For example, the syllogism through which Chartres proves why thin, white urine should be considered first is more loosely presented in Digby (88). Whereas in every disease discussed under the

sed propter assiduum et frequentem comestionem. turbida et non bene cocta apparet. Item etsi naturalis calor magis in etate illa preualeat. intenditur tamen non in qualitate. que colorat bene. sed in quantitate. In iuuenibus uero tenuis urina. et rufa est propter habundanciam colericam. In quibus magis intenditur naturalis calor in qualitate quam in quantitate. Non enim crescunt. quod est opus quantitatis. In senibus enim tenuis et alba est. Senes enim melancholici sunt. In senio autem turbata et mala propter habundanciam frigiditatis et humiditatis et propter destructionem naturalis caloris». Johannitius and Chartres call the first age *adolescentia* (MAURACH, note 46, p. 155); Isaac, *pueritia* (FONTANA, note 21, p. 163).

(86) MAURACH, note 46, p. 155.

(87) A fol. 2va: «In temporibus autem similiter considerandum est. In uere namque debet esse sanguinea. ibi enim sanguis excrescit. In estate uero colerica. In autumpno melancholica. in hyeme flegmata. Si uero in hyeme sit sanguinea. uel in uere flegmatica significat habundanciam uel sanguinis uel fleumatis sicut et in aliis». Cf. MAURACH, note 46, p. 155.

(88) See note 76 and compare to Digby (London, British Library, MS Royal 8.C.IV, fol. 180vb): «Albus enim color alios colores precedit hoc modo. Albus enim

rubric of thin, white urine, Chartres is concerned to demonstrate exactly why that disorder would produce that kind of urine, Digby seems less compulsive: for example, Digby's discussion of ephemeral fever in relation to thin white urine does not mention that ephemeral fever is caused by phlegm, an omission which from Chartres' aetiological perspective rather obviates the entire point (89). But above all, the Digby commentator (as indeed Bartholomaeus and Maurus) is much more interested in clinical matters than the Chartres master is. When the Digby commentator uses Isaac Judaeus, he tends to follow him more closely than Chartres does. Where Chartres edits out Isaac's instructions for how to inspect urine in the flask, Digby includes them, almost verbatim (90). Chartres mentions

significat indigestionem. Alii uero digestionem uel adustionem. Indigestio uero prior est digestionem. Illud enim quod indigestum est. potest digeri. Quod uero digestum est ad cruditatem nequit reduci. Vel ideo prior. quia omnes colores suscepit. Alii uero non suscipiunt albedinem. *Si quis* dicat. Nonne uidimus rubore et citrinitate aliisque coloribus de subito corpore ablatis. corpus remanere album? Ad quem dicimus impossibile est albedinem succedere. nisi prius colores illi remoueantur. quod non est ita de albedine. Iterum tenuis substantia alia precedit. Prius enim tenuitas est ibi dum nondum est facta ebullitio qua inspissatur».

- (89) Digby, fol. 181va: «Talis ueniens *in febris amphimerinis* id est cotidianis. et *multa*. significat febris *solutionem. et deficere probos humores* qui euacuatur». Cf. note 78.
- (90) Digby, fol. 179vb-180ra: «Quomodo sit colligenda notandum sit. Colligatur in uase uitreo. albo. et claro. et rotundo in fundo. ad uesice similitudinem \uel modum/. et operiatur ne frigidus aere corrumpatur. sed in naturali perduret colore. sicut exit a corpore. neque de uase in uas mutetur. ne forte mutando aer frigidus subineret. neque de loco in locum portetur. quia ex deportatione turbida efficitur. uel ingrossatur. et in ueritate cognoscenda decipitur. Rotundum uas ad modum uesice ideo oportet esse. ut parua loci [*illeg.*] facta uideatur. et sicut in uesica iacuit. sic in uase \uitreo// reponatur. clarum ideo. ut quid interius sit subtiliter uideatur. Quanta colligatur. tota scilicet quia melius tota quam pars. Actionem corporis ostendit. et iterum quia quantitas ipsius optime est consideranda. Item quia aliquando sedimen cum urina egrediens in principio m̄c/[nec]tionis ut ita dicam egreditur. Aliquando in fine. Quecumque ergo pars urine abiciatur. fortasse sedimen cum ipsa diffunditur. Quod si in calice appareret. intuentis iudicium certificaret. Si multotiens colligitur. diuersis in uasis reponatur. ut per se uniuscuiusque proprietates appareat. Quo tempore sit consideranda. Oportet ut cum a uesica exierit. antequam ab aere corrumpatur. inspiciatur. Quomodo uideatur in loco scilicet lucido solis splendore opposito. Vas in dextra teneatur. In sinistraque manu re<c>tus moueatur. ut claritas. uel turbulentia ipsius uideatur. et leuiter motus postea requiescere permittatur. ut leuitatem ypostasis et uelocitatem

that good sediment should settle on the bottom of the flask in the form of a pine cone, but the explanation is very elliptical. The Digby commentator is much clearer and more detailed about what this pine cone shape means (91). In short, one gets the impression that he is certainly more interested, and possibly more experienced, in the actual practice of uroscopy. Even when Digby mirrors Chartres quite closely, little details reveal the former's more clinical orientation. For example, Digby's discussion of diabetes is almost identical to the one in Chartres, but Digby adds that diabetic patients experience unquenchable thirst (92).

motionis uideas. Si necesse sit ad candelam uideri.' similiter fiat. Quotiens uideat.' tribus uicibus \scilicet/ et intermissiue quiescat. Vrina enim postquam exiit.' mutatur in uase multis modis. Aliquando enim mingitur tenuis.' et maneat tenuis. Aliquando mingitur tenuis.' et \postea fit// spissa. Aliquando mingitur spissa.' et manet sic. Aliquando spissa egreditur.' et postea redditur tenuis. Quod ut sciatur.' ter uidenda est scilicet statim postquam exiit. et paulo post. et iter postea tercio. et cum interuallo. Si infrig<i>detur.' non debet recal<i>fieri; quia aliquando turbida et alba ex pigricia caloris naturalis ad complementum sui exit. et postea [calore exteriori apposito.' substantia clarescit. et sumpto: *excised?*] calore extrinseco.' a calore naturali mutatur. et cum in se prius indigesta esset.' digesta uidetur. et sic cum medici necessario fallitur». Cf. FONTANA, note 21, pp. 152-153.

- (91) Chartres (L fol. 164rb): «Plana quoque id est continua. et ad modum pinee debet esse. cum ex calore in tertia decoctione omnium membrorum decoquatur. unde exiens modum pinee. in forma debet retinere. Quam formam si habuerit perfectam temperantiam caloris in corpore sine aliqua uentositate significat perfecta». (The section in which this passage would be found is missing in Erfurt). Digby (Royal 8.C.IV fol. 180rb): «Substantia uero plana id est continua; ut sit acuta superius grossa inferius. ad modum pinee que forma est ignis in quo notatur quod calor preualet in digestionem naturali. et inde formam accipit ignis». Where this notion that urine sediment should look like a pine cone comes from is not known. Isaac does not say this. However, he does say that good hypostasis should settle to the bottom of the flask in the form a heap, wide at the bottom and narrowing to a point at the top, like a flame. A few lines later, he adds that the heart is shaped like a pine cone, because it is the seat of the natural heat (FONTANA, note 21, p. 205). Digby has evidently grasped Isaac's main point, which is to link the heat of digestion to the shape assumed by the sediment.
- (92) Digby commentary, L fol. 181rb: «*Vrina etiam talis. multa* in quantitate. et *similis* id est continua. in tempore *significat diabetem* id est id est [*sic*] transitum frequentem. fit aliquando in renibus nimia caloris distemperantia propter nimium laborem. uel aliam causam. Quoniam uero caloris est attrahere. renes quasi siticulosi

Where Chartres condemns the sediment-free urine of athletes as «unnatural» Digby takes a more neutral and pragmatic approach: these people are obviously healthy, so in this case, urine without sediment must be natural (93). Like Isaac, but unlike Chartres, Digby is interested in the effect of all the «non-naturals» on the state of urine; Chartres is only interested in the seasons, because unlike the other non-naturals, the seasons have qualities which link them to the humours. The converse is that Digby is somewhat less interested in issues which could be classified as natural philosophy than is Chartres: Digby, for example, is not curious about why blood is red. The commentator views the chromatic spectrum of urine as a scale running from indigestion through to overdigestion, from excess cold to excess heat, not as an illustration of how colours emerge one from the other (94).

semper attrahunt sibi aquositatem ab epate attractam. licet indigestam. epar a stomacho. stomachus ab exterioribus ubi quia digestionis \uel decoctionis// non est locus conueniens. et renes in retentione sunt debiles.' statim transit ad uesicam et exit. Vnde fit continuus fluxus urine et sitis indeficiens. cum renes saturari non possunt. humiditatem attractam retinere nequeunt». Cf. note 77.

- (93) Chartres (L. fol. 164va): «Queritur autem quare illas solas naturales dicat. ubi ypostasis alba apparet. cum sepiissime in urina robustorum nulla uideatur ypostasis. Et dicimus quia robusti non sunt perfecte temperati sed in calore intensi. Qui calor etiam fecem sanguinis <que> in tertia decoctione debet esse ypostasis consumit. ideoque urina eorum non iudicatur naturalis». Digby (fol. 180va): «Queritur quare illas solas naturales dicat. ubi est ypostasis alba. et cetera. Cum sepiissime in urina robustorum et sanorum nulla uidetur [*corr. to uide[r]atur*] ypostasis. et dicimus quia hoc contingit ex caloris fortitudine. Tantus est in eis calor qui superfluitatem tercie digestionis omnino consumit. uel per sudorem expellit. et hoc nullum malum. si sedimen in urina eorum non appareat». Digby also picked this up from Isaac, who twice mentions Galen's dictum that the urine of healthy people often does not have sediment: see FONTANA, note 21, pp. 149 and 207. Notice that Chartres refers to these people as *robusti* and Digby as *robusti* and *sani*. Isaac calls them *sani*.
- (94) Digby fol. 182ra: «[Urine which is *pallida*] significat principium digestionis et frigiditatis dominium. sed tamen coleram admisceri ex qua commixtione aliquantulum coloratur. Si plus colera ritendatur ut calor frigiditati equipolleat. fiunt mediocres colores. Rufus et subrufus. Si plus deinde intendatur colera ut calor preualeat.' fiunt rubeus et subrubeus. Deinde si plus adhuc.' et subrubicundus et rubicundus. Deinde inopon. cum aliquid nigredinis iungitur cum rubicunditate. Si plus nigredinis addatur.' fit purpureus sicut color epatis. Si adhuc plus.' kianon. cuius coniunctionis regula talis est. Si albo colore superueniat splendor id est rubor et postea adueniat plurimum

But perhaps the most striking difference, in view of the theme of this paper, is the Digby commentator's attitude towards the relationship of urine and diagnosis. The commentary opens with the observation that the functions of the human body are not simple, but multiform, and so there is not one, but many signs by which they can be read. In short, urine inspection is only one of an array of diagnostic strategies; a very practical perspective (95). Digby goes on to identify the potential reader as someone concerned to restore or conserve the health of the human body, who should bestir himself as a diligent investigator to find out from these superfluties what is going on inside the patient (96). Theophilus' book is thus primarily useful for doctors, though «no one doubts» that it belongs to *physica*, «because it deals with the contemplation of things» (97). The «hidden things», which the Chartres commentator sees as the inner organs of the body, are interpreted by Digby as the *diseases* of the inner organs [*passiones interiorum membrorum*] (98). In

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- nigredinis.' fiat kianon. Deinde fit fuscus ex albo et nigro equaliter coniunctis. Deinde fit uiridis per adustionem colere. Deinde peritron \\uel pelithmon// id est liuidus color qui profundior est fusco. scilicet nigredinem. et fit ex albedine et nigredine. principaliter tamen nigredine. fit enim hic color si nimia frigiditatis dominetur sanguini. qui dat liuiditatem. sicut possumus uidere in labiis qui propter frigus liuescunt. quibus si magnum frigus accesserit.' efficiuntur nigra. Sic et urina. fit \et/ [enim: *expunged*] nigra \ex/ nimia adustione». Cf. note 80.
- (95) Digby commentary, L fol. 177va: «Sicut in humano corpore non simpliciter sed multiformiter fit oppositio [*corr. in marg.* operatio]. ita omnis operationis non una sed multa signa apparent. Quorum quedam signa in egestionibus. quedam in pulsibus. quedam in urinis. Ceterorumque signorum subiectis constituta sunt. Item sicut aliquando sanitati. aliquando egritudini. aliquando neutralitati subiicit.' sicut eius alteritatis \\uel alterationis// diuersas significationes repperiuntur».
- (96) Digby commentary, L fol. 177va: «Merito igitur quisquis humani corporis status [*illeg.*] uel conseruandos suscepit diligens inuestigator insudet ut per quasdam superfluitates a corpore egredientes quicquid \\aliter quid// interius elaboretur. sagaci coniectura perpendat. Quorum theophilus non ignarus. hunc libellum de significationibus urinae ad communem omnium medicorum utilitatem composuit».
- (97) Digby commentary, L fol. 177va: «Physicae hunc libellum supponi nemo dubitat. cum de rerum contemplationibus agat».
- (98) Digby commentary, L fol. 177va: «Ex his manifestis quantum ad illos \\qui// habent. uel habuerunt. res obscuras. id est in efficaces operationes. et obscuros intellectus \\id est inexplicabiles sententias.// Vel habent obscuras res id est passiones interiorum membrorum sunt eis obscurae. id est latentes. ut epatis et similibus. et inde obscuros habent intellectus».

short, while Chartres pulls uroscopy away from the bedside and re-frames it as the experimental adjunct of physiology and anatomy, Digby never forgets that its purpose is to tell the doctor at the bedside what is wrong. In the end, the Digby commentary is interested in deducing diseases from urines; Chartres is interested in deducing urines from diseases (99).

8. *INVENTING DIAGNOSIS*

When Theophilus entered the classroom in the twelfth century, he was subjected to a process of expansion and re-arrangement the aim of which was to make him more comprehensible and coherent to students who had already studied Johannitius. To put it another way, the fact that Theophilus was part of the *Articella* determined how the commentators handled him. Theophilus' willing submission to his new role as semiotic corollary of humoral physiology and pathology allowed his commentators to «invent diagnosis»—both in the medieval sense of «discovering»

(99) It might also be added that Chartres' and Digby's responses to *quaestiones* are not identical. Digby's different reply to the question of why robust people have no sediment in their urine has already been mentioned. But his answer to the question of whether urine is a filtrate of all the humours also differs from that of Chartres: «His queritur an urina sit colamentum \\\sanguinis solius. an sanguinis.' et aliorum humorum \ et si sanguinis et aliorum humorum/ est colamentum.' cur sanguinis solius colamentum dicitur. Et dicimus quia est colamentum// sanguinis. et aliorum humorum. sed dicitur sanguinis solius colamentum. quia tota massa illa in epate.' sanguinea uidetur. et maior est ibi quantitas sanguinis quam aliorum humorum. et ex dignitate quia ipse solus ad nutrimentum est necessarius. uel dicamus quod sit colamentum solius sanguinis non aliorum humorum. Sanguis \enim/ primam digestionem habet in epate. cuius est colamentum urina. Alii humores in suis receptaculis digeruntur. et a se superfluitates emittunt. Si queratur quomodo \ergo/ aliorum humorum intensio \\\aliter infectio//. per urinam cognoscitur. cum eorum non sit superfluitas? R<espondeo>. intentione \\\uel infectione// illorum hic sanguis uariatur. quia aliquando uariatur. qui aliquando colericus. aliquando flegmaticus. aliquando melancholicus efficitur. quam sanguinis infectionem. uel alternationem per urinam. que ipsius est superfluitas cognosci oportet. Vnde qualiter alii humores se habent.' perpenditur. cum sanguis eorum intensione uel remissione uarietur. \\\Vnde \uel inde/ urina// necessario permutatur. Quidam eam uocant colamentum sanguinis». Cf. note 57.

diagnosis, and in our modern sense of creating it. As the Chartres commentary bears witness, uroscopy thus suggested to the more theoretically-minded medical teachers of the twelfth century the possibility of examining disease processes apart from clinical imperatives. But as Digby reveals, the more clinically oriented saw it as a paradigm for a whole array of other diagnostic strategies, and the vehicle by which the new medical *scientia* could be carried to the bedside.