



“*Sanguisuga aura:* Leeches, Markets and Medieval Medicine” ©

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University of Wisconsin
**SCHOOL OF MEDICINE
AND PUBLIC HEALTH**

Dept. of Orthopedics & Rehabilitation
Medicine

Medieval Studies

Institute for Research on Poverty

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Waisman Center / LEND

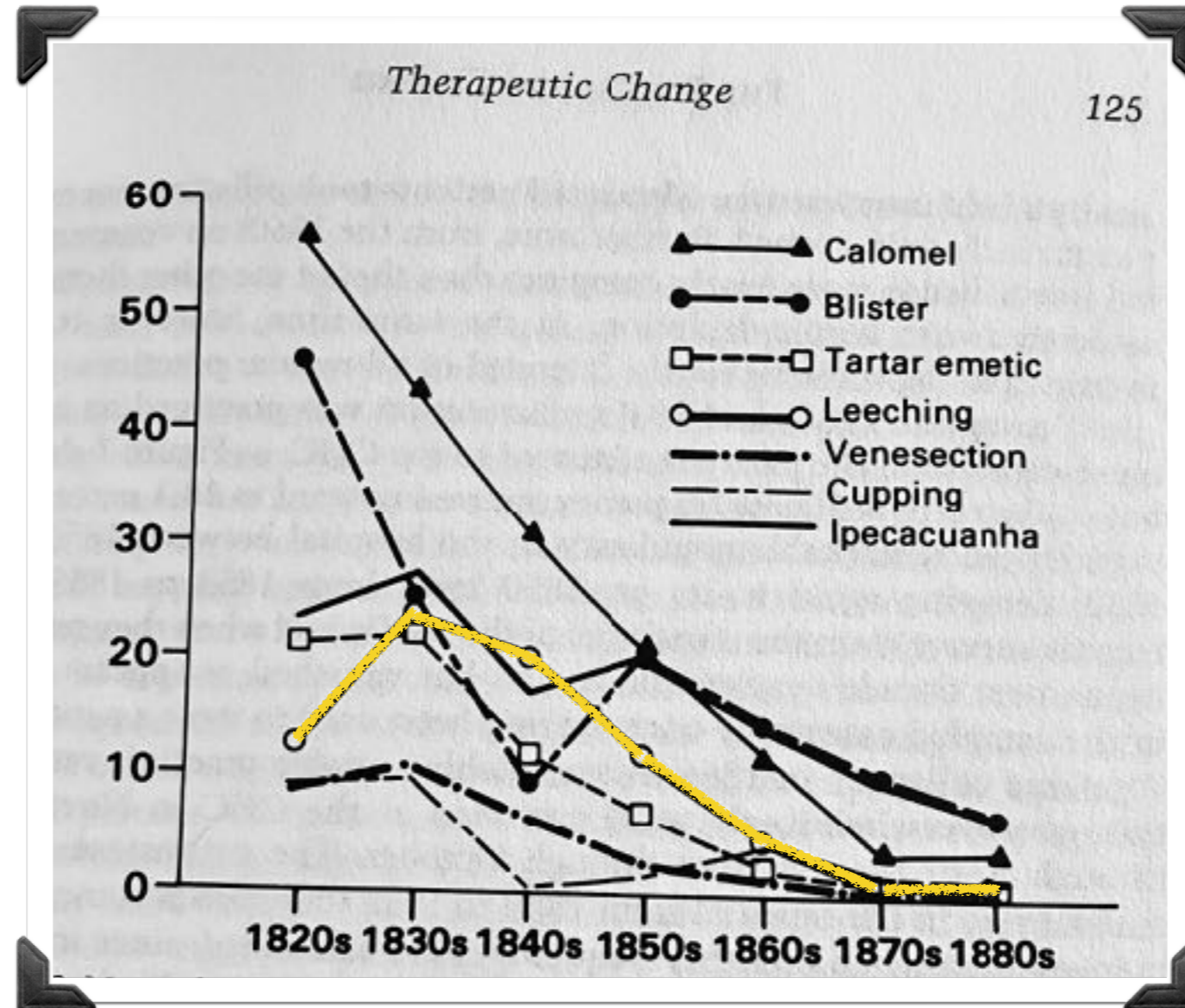
Visual Culture Studies

Disability Studies

University of Wisconsin

Thanks to Prof. Mindy Schwartz for:
Asking about primary sources for use of
leeches in the Middle Ages!

- Med School -> grad school to enhance my previous grad school work in Old English (*læce*), a most riveting experiences, was reading John Harley Warner's The Therapeutic Perspective with shifts in leeching (both senses) in 19th-century America.



Leech Therapy

Information for patients

The leech will be attached for between 30-60 minutes. Once the leech has finished feeding, it may fall off or be removed. Each leech is used only once and is humanely disposed of.



CLM 733, fo. 32r

Jean de Saint-Amand (c. 1230 - 1303)

magister

at

University of Paris
Faculty of Medicine

~20 texts

>1,000,000 words on
medieval medicine

'THE NEW GALEN'

**TADDEO ALDEROTTI
(BOLOGNA)**

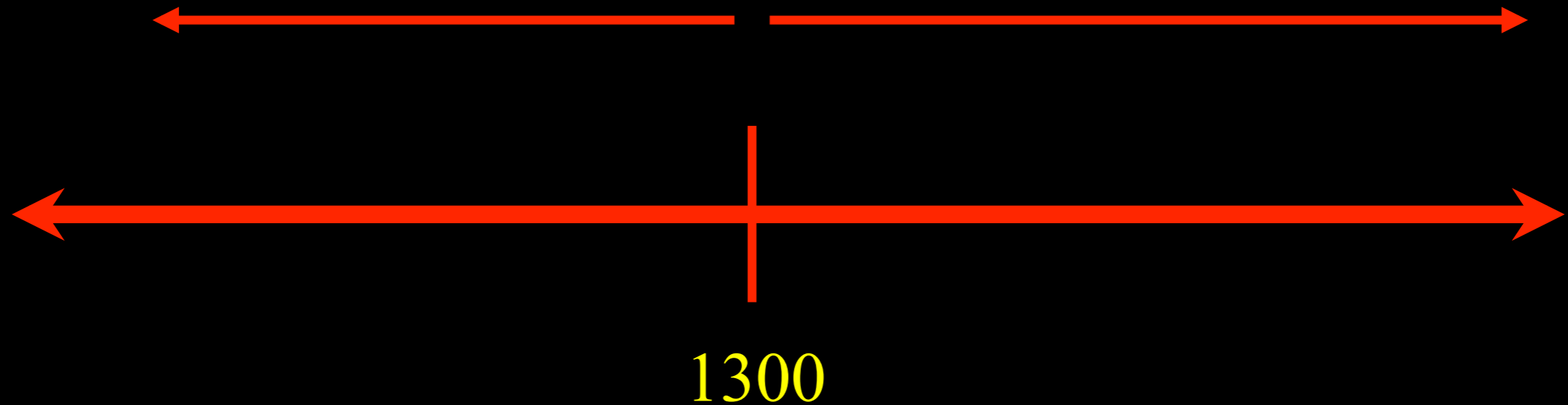
**JEAN DE SAINT-AMAND
(PARIS)**

**ARNAU DA VILLANOVA
(MONTPELLIER)**

“New Galen”

Textual absorption

Theoretical argumentation



Tabula super Antidorarium Nicolai



◆ “... a must-read for doctors interested in knowing more about the science of medicines. ... with the text of Saint-Amand, the bloodletting doctrine in the *Canon of Avicenna* was introduced into Latin medical literature. This is precisely the place where the character of phlebotomy as a universal evacuation is underlined for the first time. From then on, it is not unusual to find, in general works dedicated to medicines...”

Pedro Gil-Sotres, *Scripta minora*, pp. 63-79 and quote from PG-S e Luke Demaitre, *AVOMO*, IV, p. 92.

HEALTHCARE
IN EARLY MEDIEVAL
NORTHERN ITALY

More to Life than Leeches



Clare Pilsworth

BREPOLS

Complex Modern Historiography

- Clare Pilsworth's compelling Healthcare in Early Medieval Northern Italy (Turnhout: Brepols, 2014), pp. 1, 5, and 100 & subtitle "More to Life Than Leeches:" intriguingly finds little to no leeching in early medieval medicine (in northern Italy and beyond).
- P. 1, includes the homonymic Old English epithet.

Curriculum linguae

- Introduction
- The language of leeches
 - *Hirudo/Sanguisuga*
 - *Léce*
 - *Sanctu*
- 'Places' of leeches (and medieval implications)
- 'Airs': Theology and leeches
- 'Waters': Zoology
- Medicine
- Conclusion



Valenciennes Mun Lib Ms 320

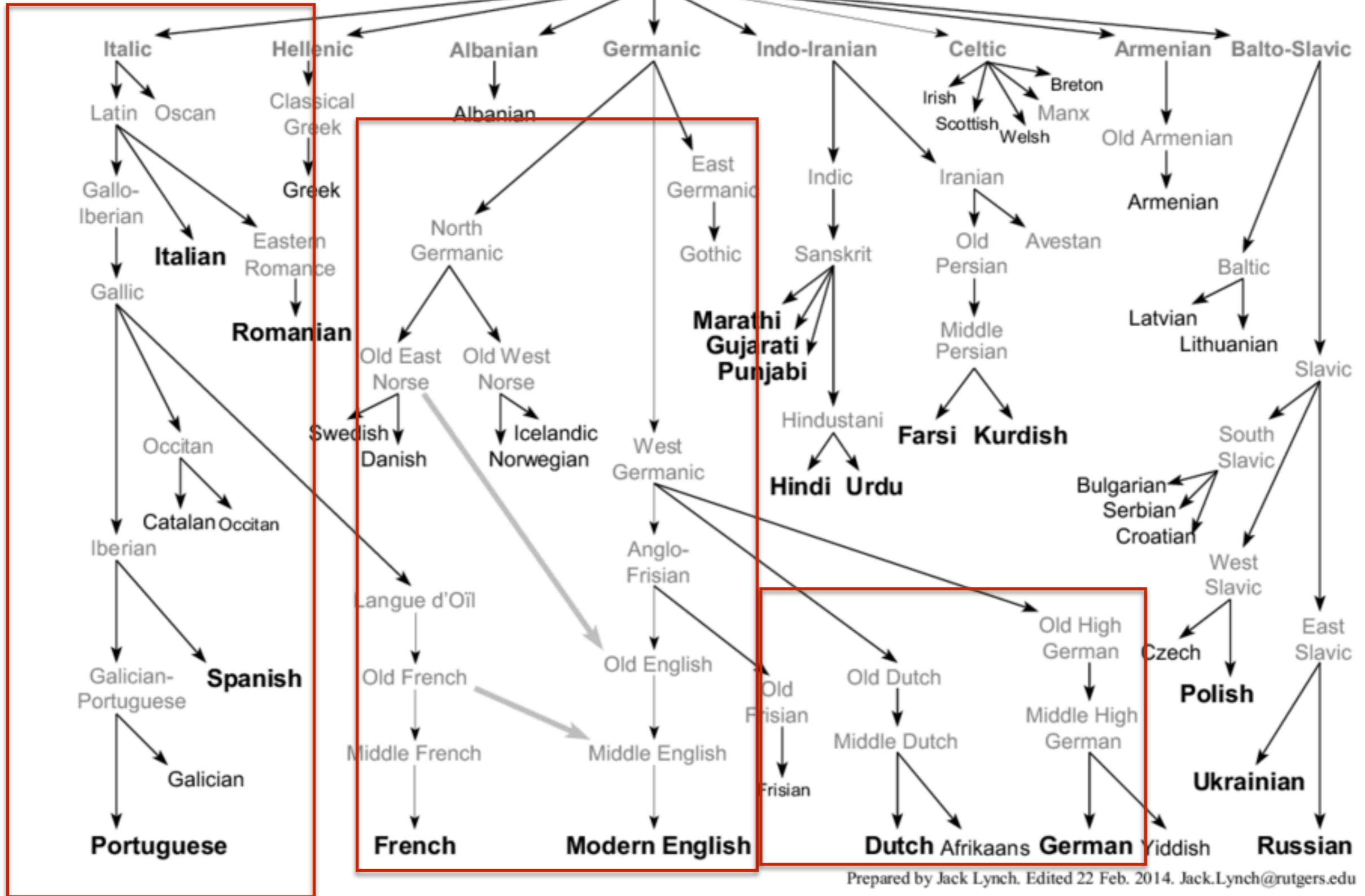
Medical Use of Leeches:

- > 3500 years ago with Babylonian and Egyptian as well as Greek, Mayan, Vedic, and Aztec bloodletting

Etymologies

- Alaq (Arabic)
- Jalagalu (Telugu)
- Jalu (Hindi)
- Jiganey (Kannada)
- Jaluka (Sanskrit)
- Attai (Tamil)
- Jonk (Urdu)
- Salook (Turkish)
- Zalu (Persian)

Proto-Indo-European





Complicated etymology

Some suggest from suffix-related to '*testudo*,' 'tortoise,' but no 'hiru-' stem is known; possibly no-stem '*hiru-*' 'intestines' having a wormlike shape, but non-constructable, so may be cognate, non-IE loanword(s)

Hirudo

Plautus



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literally, ‘blood’ (*sanguis*)
+ ‘sucker’ (*sugo*)

Pliny

Sanguisuga

ancient, inherited
compound word

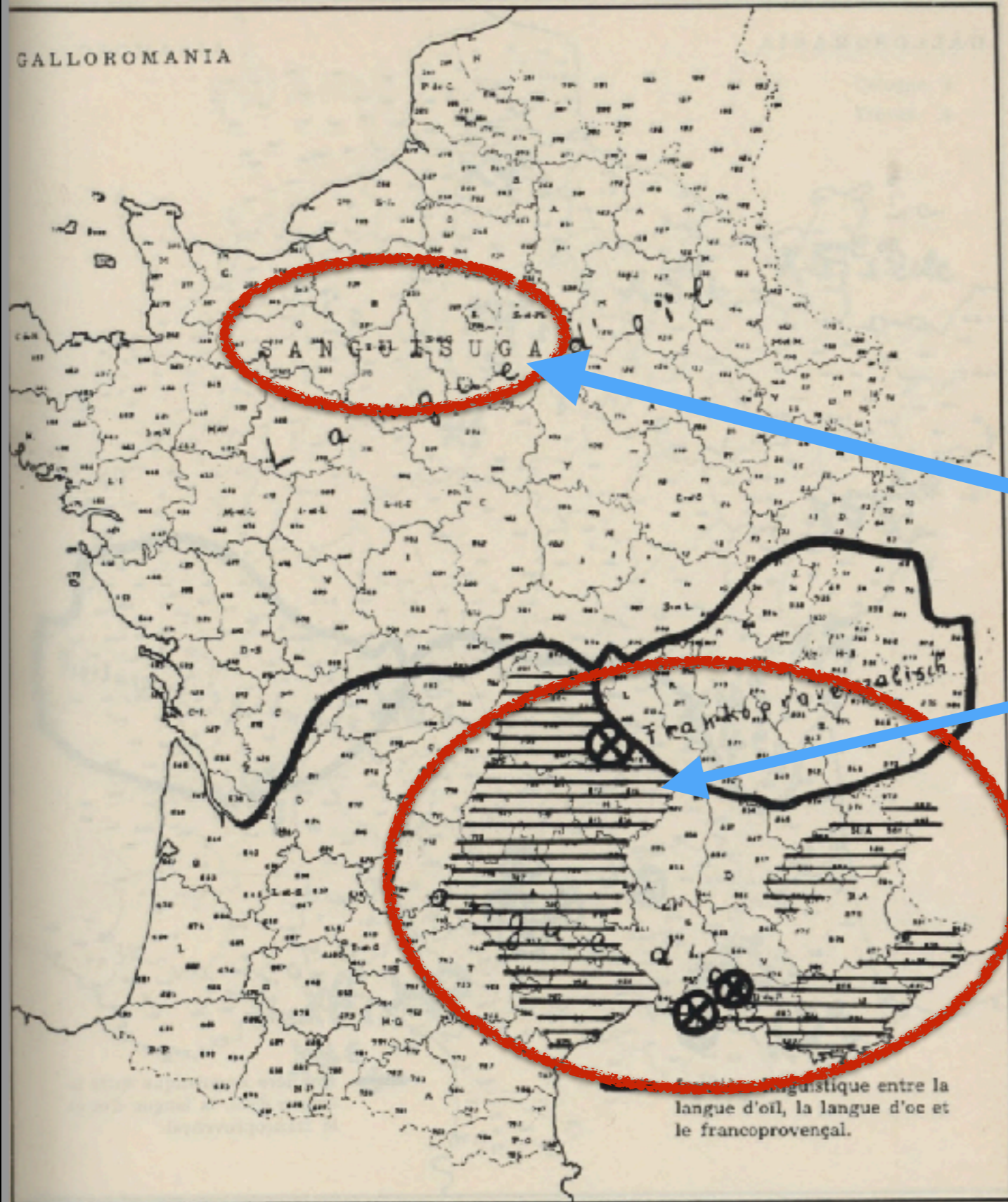
(1st c.): “I notice that it has generally begun to be called *sanguisuga*.” NH 8,29

Sangsue

Hirudo

Plautus

Re: “the application of *hirudo*, which are commonly called *sanguisuga*” Caelius Aurelianus (fl. 5th c.) *Chron.* 3, 2, 25 & “which we [doctors] call *hirudo*” I.1.13



From the first century CE, *sanguisuga* progressively replaced *hirudo*, though at times it did so geographically

C. Schmitt, "Genese et typologie des domaines linguistiques de la Galloromania," *Travaux de linguistique et de littérature*, 1974;12:: 31-83, at p. 73.

Fig. 11

HIRUDO dans la Galloromania.

- ⊗ d'après ALF 1189
- ≡ d'après le FEW



BnF, MS Latin 13396 fol. 1v

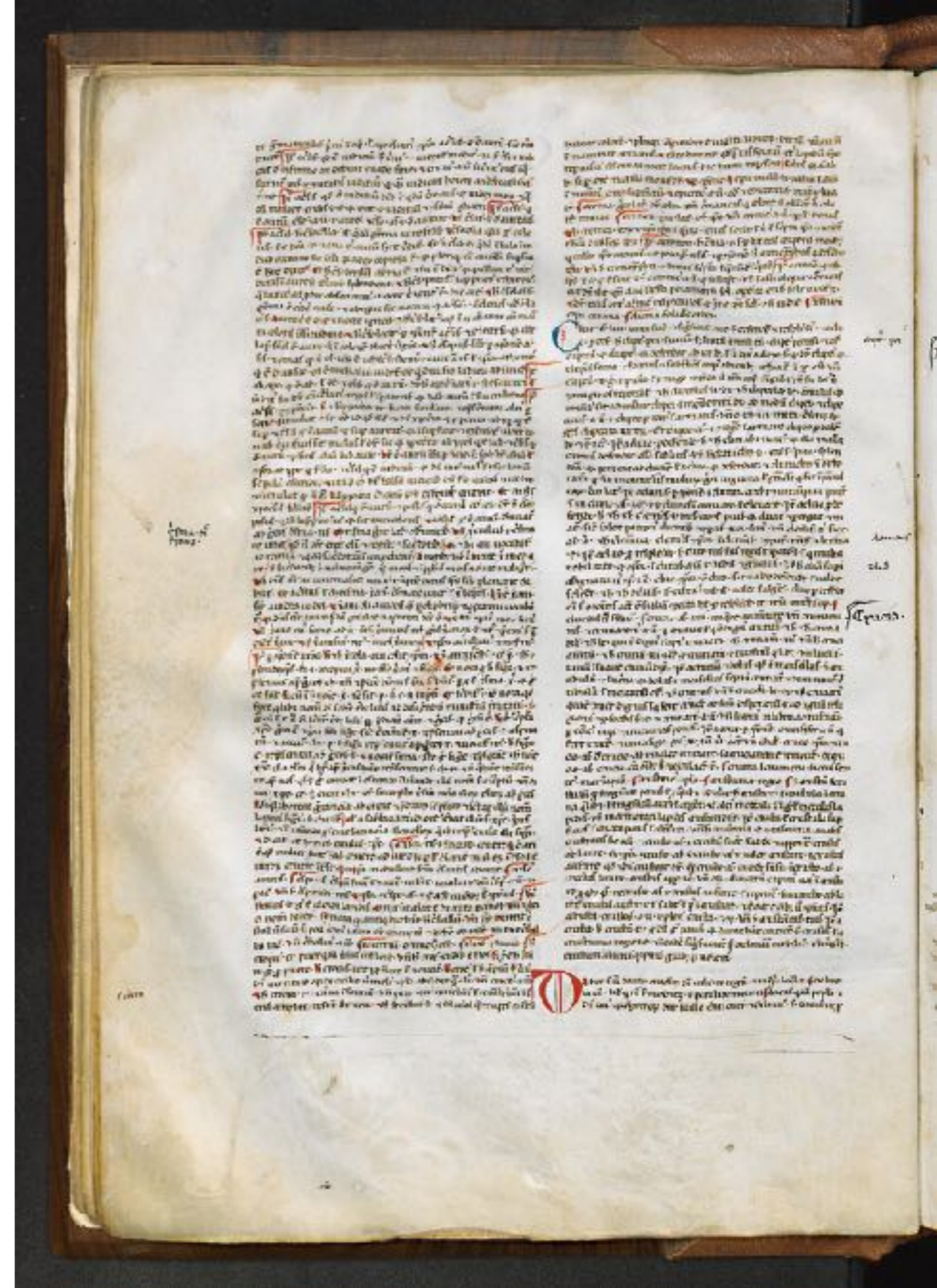
Isidore of Seville (c. 560-636)

- *Etymologies*
- Speaks of the entomologic meaning
- No medical meaning / use

348 XII. 5. 3: “The leech, *sanguisuga*, is an aquatic worm so named because it sucks blood. It conceals itself in drinking water, and when it reaches the cheeks or somewhere else, it adheres, and sucks blood. When distended with blood over its capacity, it vomits what it has drunk, and again sucks fresher.”

Uguccione da Pisa (c.1130-1210)

- ***Derivationes*** arguably the most broadly-circulated and important medieval encyclopedic dictionary
- **Alphabetical** by principal lemmas of simple words
- Uses method of **iterative derivational lexicography** (*disciplina derivationis*)
- **Cites** directly sources with (~ 2500 quotations)
- **Dante** used the *Derivationes* throughout his life and cited them in the *Convivio* (IV.6.5)



Biblioteca Medicea Laurenziana MS 27 sin. 5, 90rb (1236)

Derivationes

- *Hirudo*
- “Item ab hereo hec hirduo -nis, idest *sanguisuga*, quia carni adhereat, unde Oratius (*ars* 476) ‘non missura cutem nisi plena curoris hirudo’; unde hirudineus, -a -um et hirudininus -a -um in eodem sensu.”

Derivationes

- *Sanguisuga*
- “Sanguis compositure exsanguis -e idest extra sanguinem, et hec *sanguisuga* -ge, idest vermis aquatillis scilicet *hyrundo*, quia sanguinem sugat...”

Complicated etymology

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Pliny

Sanguisuga

Hirudo

Plautus

ancient, inherited
compound word



Sangsue

Pr-Ger

*lēkja-

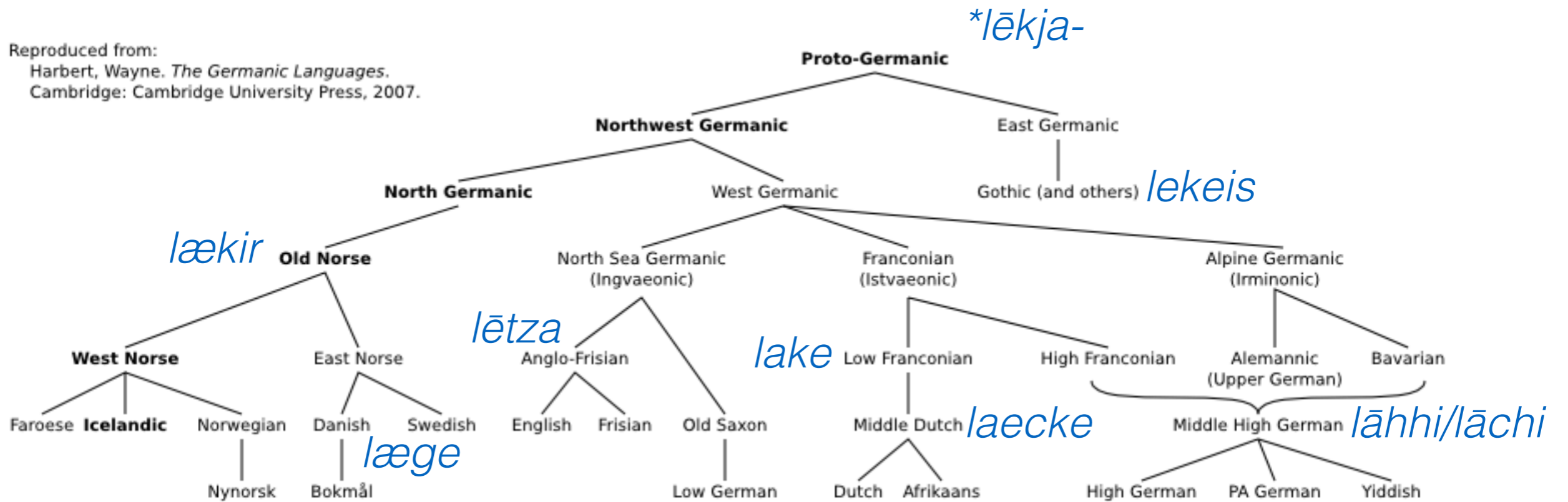


leech

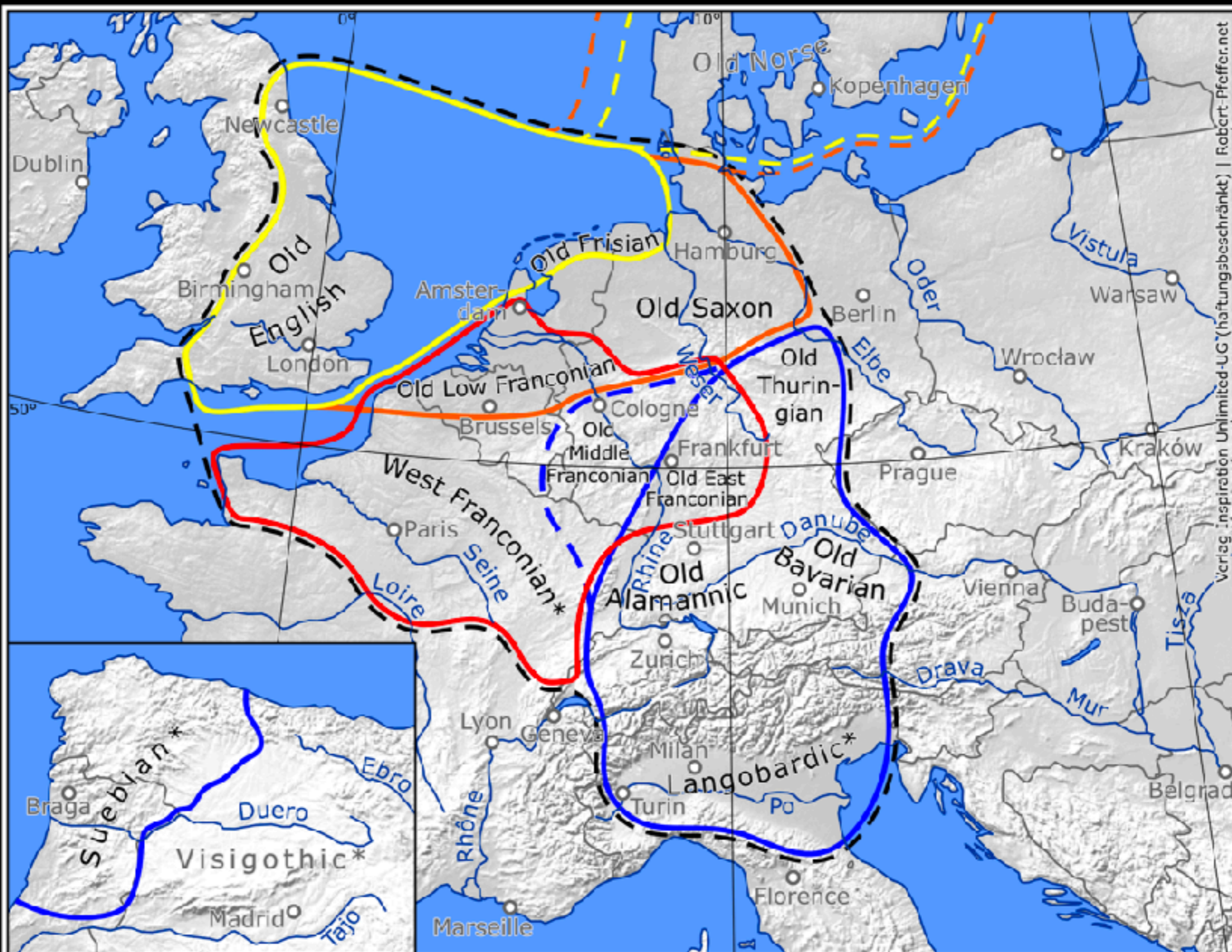


'Leech'

Reproduced from:
 Harbert, Wayne. *The Germanic Languages*.
 Cambridge: Cambridge University Press, 2007.



- *lēkja- Proto-Germanic
- lekeis Gothic
- lækir ON
- læge Da
- leech E
- lētza O Fri
- lake O Du
- laecke M Du
- lāhhi/lāchi OHG



YELLOW: North Sea Germanic (Anglo-Frisian) **RED:** central West Germanic (Proto-Franconian)
ORANGE and **YELLOW:** northern West Germanic **BLUE:** eastern and southern West Germanic
 The dashed lines in the north denote similarity of northern Germanic with North Sea Germanic (yellow) and with northern West Germanic (orange).
 * Superstratum, i.e. language of the upper class in mostly Romance-speaking areas

Old English

- The ‘longitudinal’ **language of occupation** / colonization of England from the invasion of the Angles, Saxons, and Jutes [? Frisians] (5th c. to 11th c.) over that of the occupied (Celtic, Common Brittonic, and Latin)
- Language of **elite status and learned power** divided amongst the emergent seven kingdoms in England
- Divided roughly into 3 (or 4) **constituent dialects**

Dialects of
Old English
c. 800
(scattered
across the
Heptarchy of
kingdoms)



Old English

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- Language of **elite status and learned power** divided amongst the emergent seven kingdoms in England
- Divided roughly into 3 (or 4) **constituent dialects**
- Consolidated (in large measure) into **West Saxon under Ælfred the Great** (r. 871-899) and the Winchester school of Ælfric

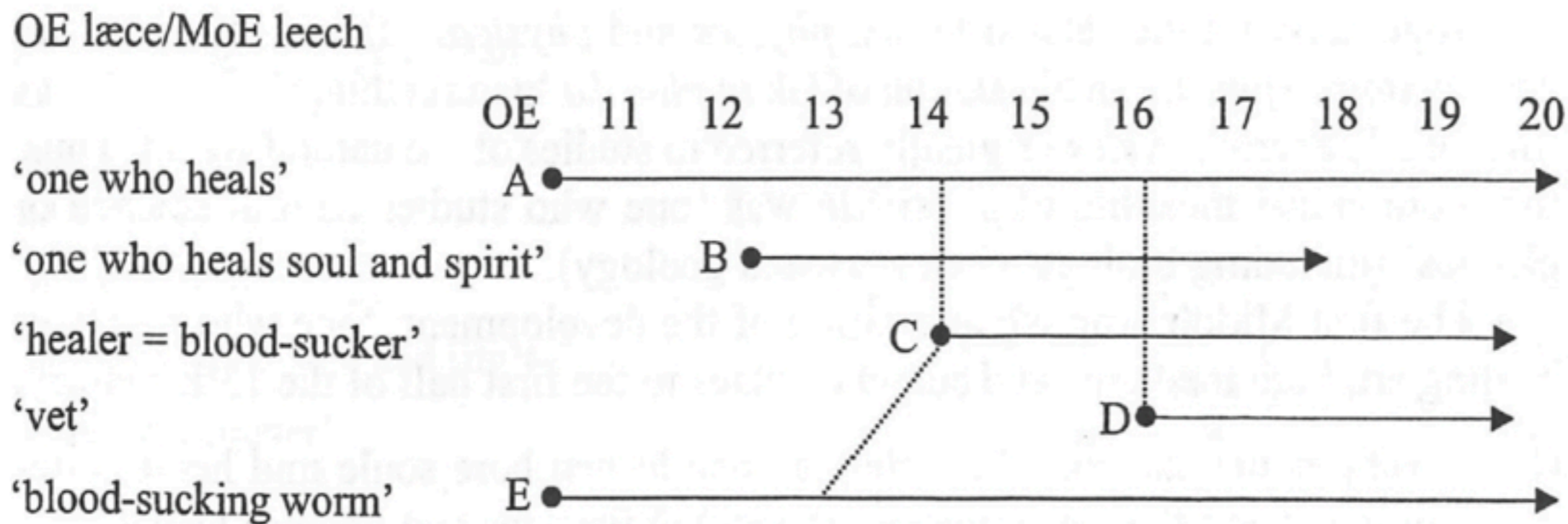


Fig. 1. Semantic development of *leech* according to Sylwanowicz (2003, 157)

Marla Sylwanowicz, "Leech, Doctor, Physician: On the Loss of Prototypical Meanings," *Anglica*, 2020, 29(2): 151-64 at p. 157

PIE: *leig-* (~tying/binding) -> tying/binding -> ligature, league, religion

PIE: *leg-* (~speech, ? magical healing) -> lecture, intelligent, legend {though from Pokorny's Indogermanisches etymologisches Wörterbuch, II, I see "leg-" to take care about"}

- *lǣce*: leech (worm), a. 900 CE
- MDu cognate to *lieke/lake*

- *lǣce*: doctor, c. 900 CE
- cognate to 'healer':
 - OFr *letza*
 - OSx *laki*
 - OHG *lakki*
 - ON *læknir*

lǣce ? artificial linkage, perhaps by popular etymology

Láce as animal and healer:
A “false cognate”

– Willis, *Linguistic Orphan*, PhD diss,
UMCP, 2018, p. 2, n. 3 (emph. mine)

Physician



Leech



Leech



PIE: *leig-* (~tying/binding) -> tying/binding -> ligature, league, religion

Possibly

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- Madden, *Word Frequencies* (1952), p. 238: 12
- Madden and Magoun, *Word Count* (1964), p. 6: 322
Fairly common (even compared with particles

-læce

- Adjective Suffix

Dictionary links

- [OED](#) [NED](#) [MED](#) [DOE](#) [DOEC](#) [PIE](#)

Grammar

-læce, an; f. v. scín-læce: -læce; adj. v. eáp-læce

Wright's OE grammar

§119; §274; §311; §354;

and efen-læce.

LÆCE

(n.)

es; m.

A LEECH ♦ **doctor** ♦ **physician** ♦ **a leech**

Entry preview: Spl. læcas) weccan aut medici suscitabunt, Ps. Th. 87, 10. Ðeáh ða woroldlecon læceas [Hat.

læce-cræftig

(adj.)

adj.

Entry preview: Skilled in medicine

Arestolobius wæs háten án cing hé wæs wís and læcecræftig hé ðá gesette forðon góðne morgendrænc wið eallum untrymnessum ðe mannes líchoman iond styriap there was a king named Arestolobius, he was wise and skilled in medicine, for

læce-seax

(n.)

es; n.

Entry preview: A surgeon's knife Se læce hýt ðonne his læceseax under his cláðum medicus abscondit igitur ferrum medicinale sub veste, Past. 26, 3; Swt, 187, 9

eáp-læce

(adj.)

-læcne (-lác-); adj.

Entry preview: Bið þ

eáðlæcnere, 284, 23, 29. v.

un-eáplæce, -læcne

læce

Entry preview: Voc. i. 22, 28. v. riht-, un-, weorold-læce. Add On læces mere, C.D. v. 325, 19. On læcemere, vi. 72, 25. Tó læces forða, 9, 11.

On læces ford, 120, 9

læce-cynn

(n.)

es; n.

Entry preview: The race of physicians or surgeons

Náefre [ic] læcecynn on folcstede findan meahthe ðara ðe mid wyrtum, wunde gehælde never could I find on the battlefield the leeches, those who with herbs my wounds would heal, Exon. 102 b; Th. 288, 20; Ps. 6, 10

læce-sealf

(n.)

e; f.

a plaster ♦ *malagma*

Entry preview: A medicinal salve or ointment, a plaster; malagma, Wrt. Voc. i. try preview: Se getýda læce ðæs heofonlican læcedómes ægðer ge ðá hálan lærde ge ðám unhálum læcedóm eowde peritus medicinae coelestis apostolus non tam sanos instituit, quam infirmis medicamenta monstravit, Past. 397, 15-17.

læce-seax

(n.)

es; n.

Entry preview: A surgeon's knife Se læce hýt ðonne his læceseax under his cláðum medicus abscondit igitur ferrum medicinale sub veste, Past. 26, 3; Swt, 187, 9

un-læce

(n.)

es; m.

An unskilful physician

Entry preview: An unskilful physician Hú unlæcas (cf. unwise læcas, 232, 8)

wénaþ ðæt ðæt sié lendenáldl, Lchdm. ii. 164, 8

læce-finger

(n.)

es; m.

The leech-finger

Entry preview: Sing on ðíne læce-finger paternoster, Lchdm. i. 394, 2. [In later times it was the fourth finger e.g. Halliwell in his Dictionary quotes from a MS. of the 15th cent.

Linked entry: **gold-finger**

læce-dóm

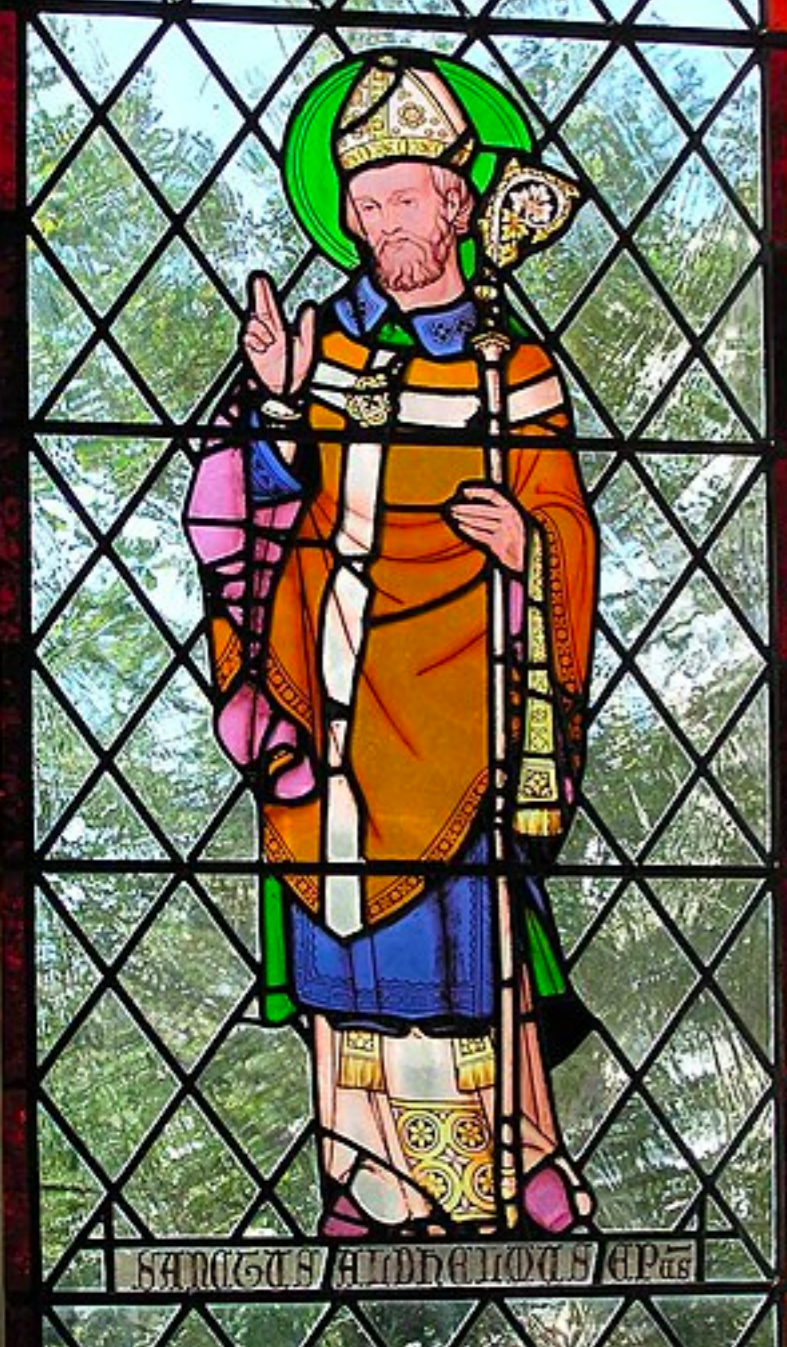
(n.)

es; m.

Medicine ♦ **a medicine** ♦ **remedy** ♦ **cure**

Entry preview: Medicine, a medicine, remedy, cure Læcedóm medecina, Wrt. Voc. 74, 5; Lchdm. ii. 16, 9-27. Lécedom, Kent. Gl. 148. Læcedóm malagma, Wrt. Voc. ii. 75, 59; cura, 92, 61. In untrymnisse wæs ðú læcedóme in infirmitate sis medecina, Rtl. 105, 13. On ðare

læce-dóm



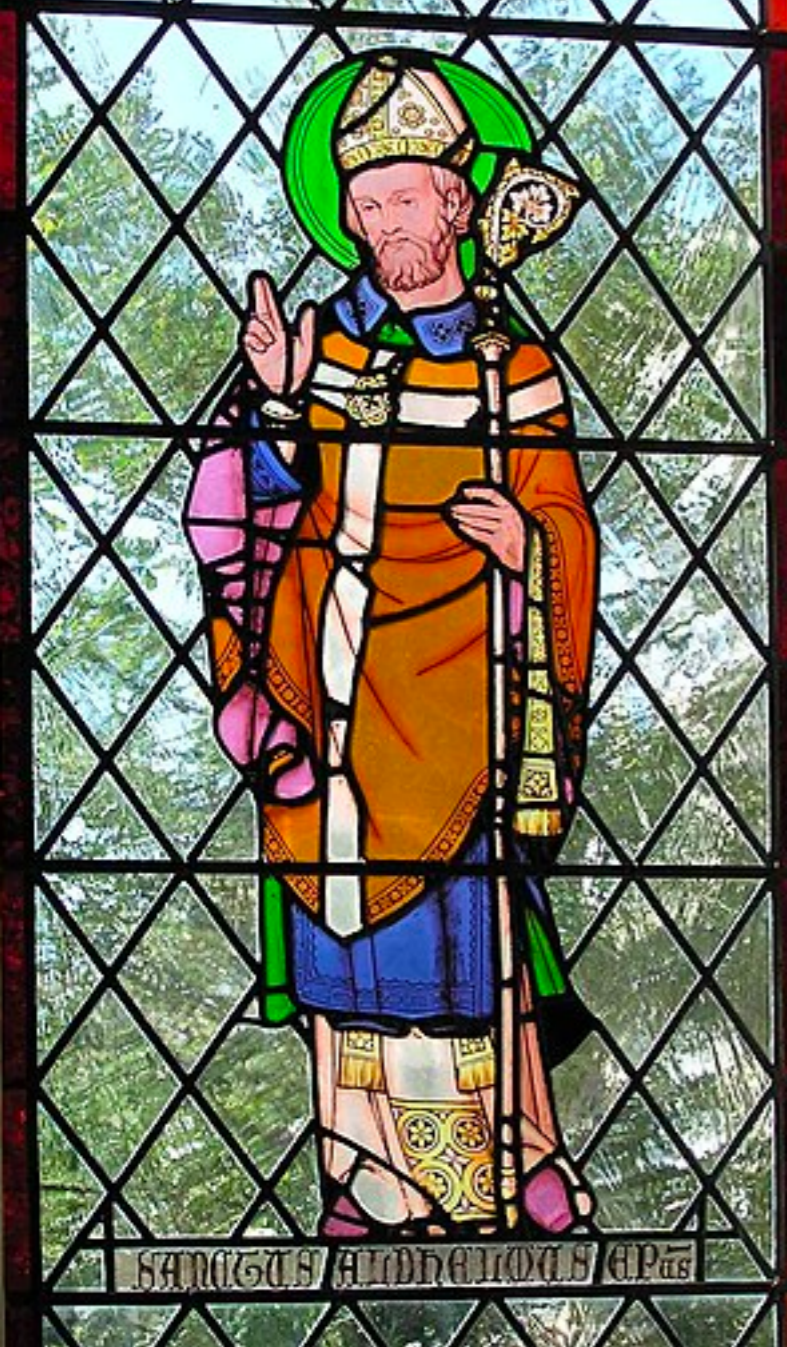
Malmesbury Abbey from 1928

- Aldhelm of Malmesbury (late 7th / early 8th c):
- *Riddles*, xliii: MGH Auct. ant. 15, p. 116, Rudolf Ehwald, hrsg. (Berlin, 1919) :

“But I bite unfortunate bodies with three-furrowed wounds and so bestow a cure from my healing lips.” [emph. mine]

Figure.1 Mouth of the bloodsucking Medicinal Leech (Brown FA., 1950)





Malmesbury Abbey from 1928

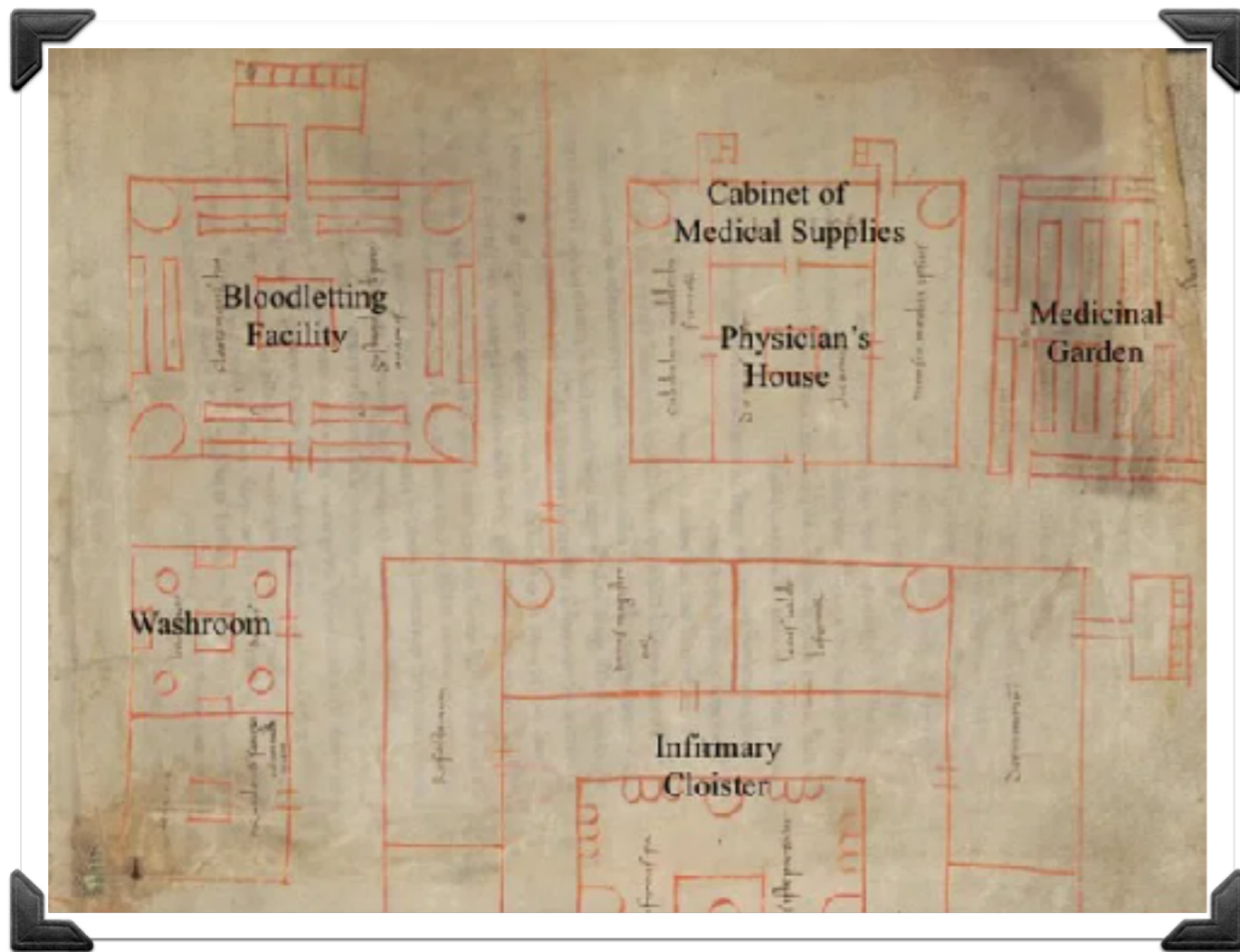
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“But I bite unfortunate bodies with three-furrowed wounds and so bestow a cure from my healing lips.”

- Apparently nowhere else in Old English, do we see a health-related reference to the leech-worm.



- Ælfric's Winchester School translated *Benedictine Rule*



Monastic Life: Rules and the Plan of Saint Gall (820-830) - bloodletting occurred regularly and affected architecture and policies

In Ely, monks were bled six times a year in cohorts; at Barnwell seven; bleeding could be performed in the *dormitory* or *infirmary*; the Benedictines in England had a house in an outer district; at Durham, the blood house floor was paved and “twelve earthen dishes” brought for use at the blood house [disposal?].

Flemming (1928), p. 775



- Ælfric's Winchester School translated *Benedictine Rule*
- Monks required to be bled multiple times a year

Could Ælfric's Winchester School standardization of OE with its penumbral OE tr. of the *Benedictine Rule* and use of *laece*, be part of the updrive of *laece*?

Anglo-Norman (Insular Norman)

- The **'temporary' language of occupation** / colonization of England from 1066 to ~1499
- Language of **elite status** and learned power over the language of the conquered, Old English (think conventional Robin Hood compared to Guy of Gisbourne)
- As an **idiolect** it represented upward mobility, and yet **comparative inferiority** to Continental French
- Ultimately **overturned** (to a large extent) by **Middle English/English** (think Chaucer then Shakespeare)

“Pur facre cheveux crestere: Pren sansues d’eauwe e les quisez mult bien en eawe, puis ostés de feu e lessez refreider. E quillez la cresse sus la eawe e oignez ceo que vous voidrés. E sachez que chevelure crestera.” [Sloane 962 (S), emph. mine]

“Il le trouera en sa herde Schal he fynde in his floe / Si treit le sang vn sangsue / So drawith blode the watzlrleche / Come venteuser de char crue / As the ventuser of rawe flesch / Oisel heit escarrie”
[MS.Camb. Univ. Lib. Ee. 4. 20, fol. 16r, emph. mine]

A shift

- *Medicus* and *physicus* begin to enter more clearly into administrative documentation (c. 1090s to 1150s)



(1990)

The Medical Meaning of *Physica*

*By Jerome J. Bylebyl**

DURING THE LONG INTERVAL from the fifth century B.C. to the early modern period, the classical traditions of medicine and natural philosophy underwent repeated interactions, resulting in significant overlaps of content and method. The two disciplines nevertheless retained distinct identities through most of this coexistence, with the notable exception of a medieval phase in which scholars tended to conflate them.¹ By the ninth century the word *physica*, without having lost its classical meaning of “natural philosophy,” was beginning to displace *medicina* as the designation of medical learning (as distinct from practice), and during the twelfth century *physica* came to refer to both the learning and the practices associated with rational medicine. Similarly, by the early Middle Ages *physici* (natural philosophers) were being cited as literary authorities on specifically medical issues,² and during the twelfth century the singular *physicus* became a preferred alternative to *medicus* (healer) for designating an individual medical expert. After prevailing for several additional centuries, these usages passed out of currency in continental Europe, stranding the English words “physic” and “physician” as major vestiges.³

A shift

- *Medicus* and *physicus* begin to enter more clearly into administrative documentation (c. 1090s to 1150s)
- Shift of *medicus* to *minutori* (bloodletter) (“John” under Henry II)
- Wlmarus the *minutor* (charter at St Pauls’ cathedral 1138 / 1152)
- Patronymic: Martin le Leche, William le Leche, Roger le Leche
PRO Ms Ancient Deeds, A 12132 (p. 190,n.6)
- Lewis le Leche, Getz, p. 77
- There were female leeches, “la laece” (Getz, p. 95 n. 24)

King Henry III (England) and the Holy Blood Relic



Corpus Christi College, Cambridge, *Corpus MS 16, fo. 215r*

Simultaneous with a
rebirth of dissection and
reliquary dismemberment



Leeches' Impact on Place Names

Her sputelað seo gecpydrædnes ðe ('Here the Word is revealed to thee'). Old English inscription over the arch of the south portico in the 10th-c St. Mary's church, Breamore, Hampshire

Læce (English)

Place Names

The image displays a map of South West England with a red pin marking the location of Lashbrook. A detailed inset map shows the Lashbrook area, including the River Lash and the village of Lashbrook. A legend in the bottom right corner provides options for map features:

- Satellite
- Modern
- NLS 1888-1913
- Tithe Map Overlay
- Maps Boundaries
- Maps Names
- Hide/display markers

Information for the selected location (Lashbrook):

Id Number	32
Id Name	Waun Gelod
Occupier	John Lewis
Owner	Thomas Lloyd Esquire

Map features include the Bristol Channel, Exmoor National Park, and Dartmoor National Park. The map also shows the B4548 road and the location of Lashbrook relative to other towns like Bideford and Taunton.

Waun Gelod (Welsh)

Place Names

Id Number 32
Id Name Waun Gelod
Supplier John Lewis
Idowner Thomas Lloyd Esquire
[View Map](#)
[View Apportionment](#)

The map shows the Waun Gelod area in North Wales. A legend in the bottom right corner includes: Satellite (radio button), Modern (blue dot), NLS 1888-1913 (radio button), Tithe Map Overlay (checkbox), Maps Boundaries (checkbox), Maps Names (checkbox), and Hide/display markers (checkbox with checkmark). An inset map in the top right shows the location of the area within North Wales, with an orange box highlighting the specific region. The main map features a green circle with the number '2' and a blue pin with the number '56' near the location.

The map shows the entire country of Wales. A legend in the bottom right corner includes: Satellite (radio button), Modern (blue dot), NLS 1888-1913 (radio button), Tithe Map Overlay (checkbox), Maps Boundaries (checkbox), Maps Names (checkbox), and Hide/display markers (checkbox with checkmark). An inset map in the top right shows the location of Wales within the United Kingdom, with an orange box highlighting the country. The main map features an orange circle with the number '100' in the southwest of Wales. Labels on the map include Amlwch, Holyhead, Bangor, Caernarfon, Pwllheli, Gwynedd, Ceredigion, Carmarthen, Swansea, Powys, Herefordshire, Merthyr Tydfil, Rhondda Cynon Taf, Monmouthshire, and Newport.

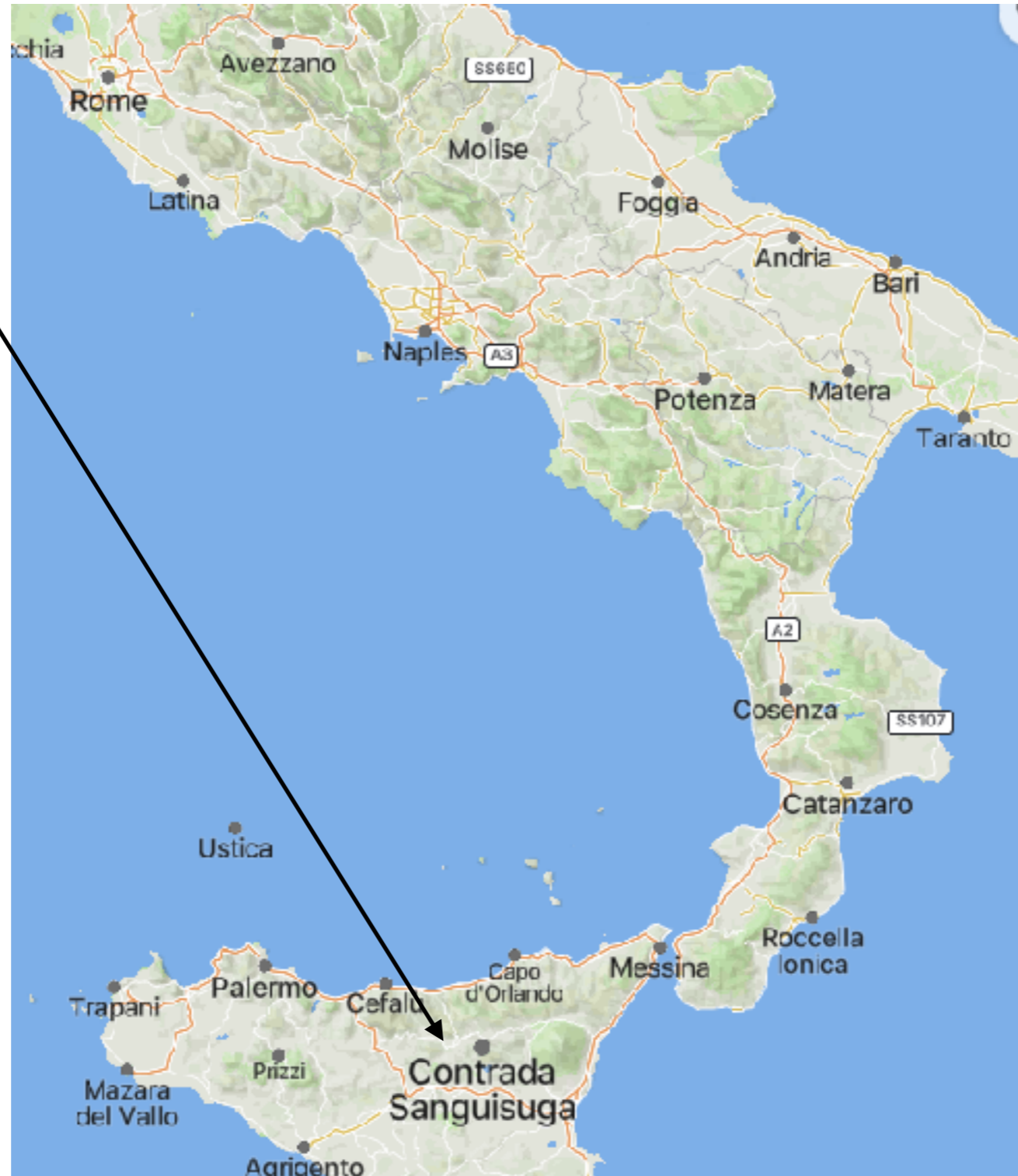
Sangsue (French)

Place Names



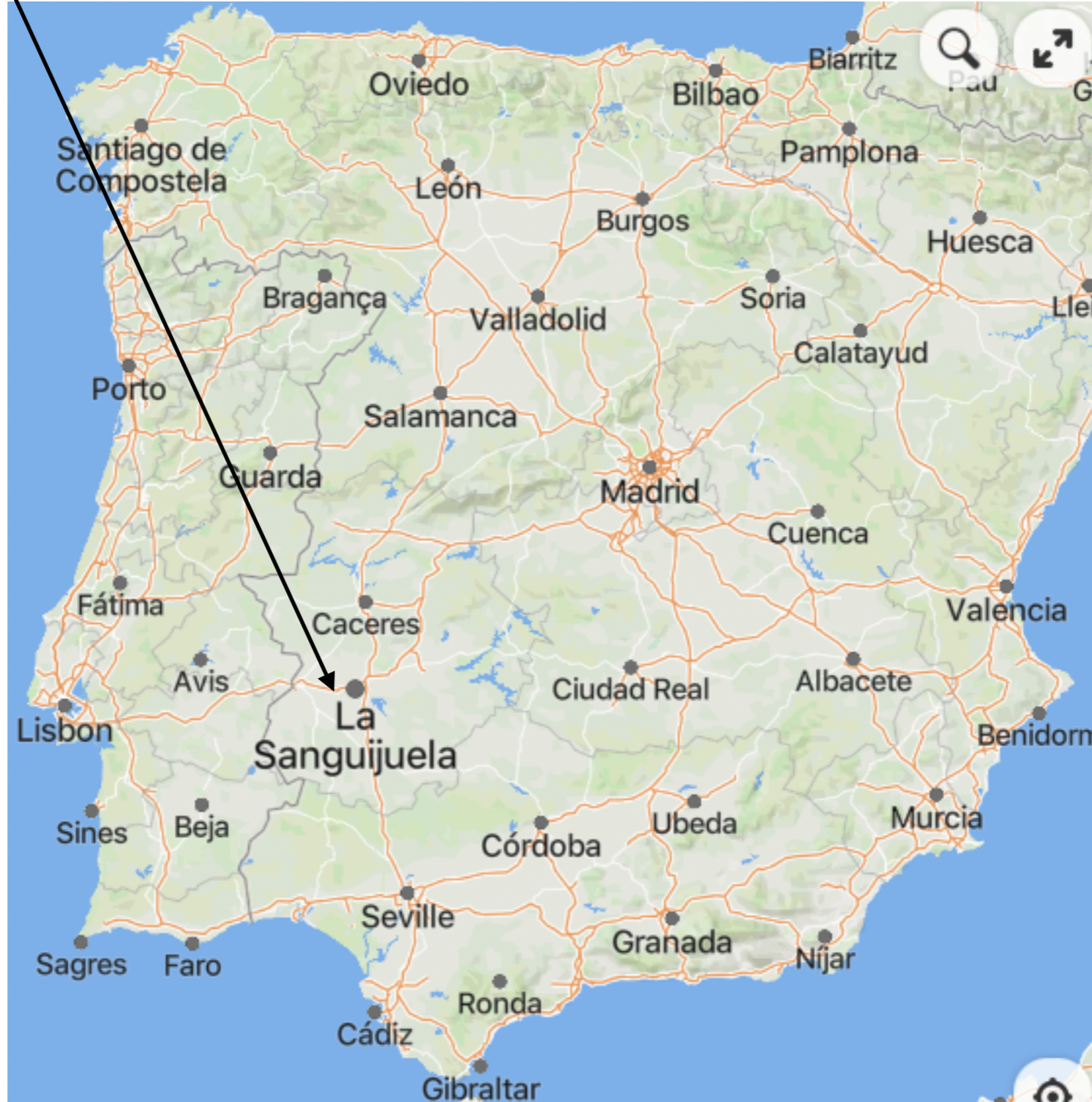
Sanguisuga (Italian)

Place Names



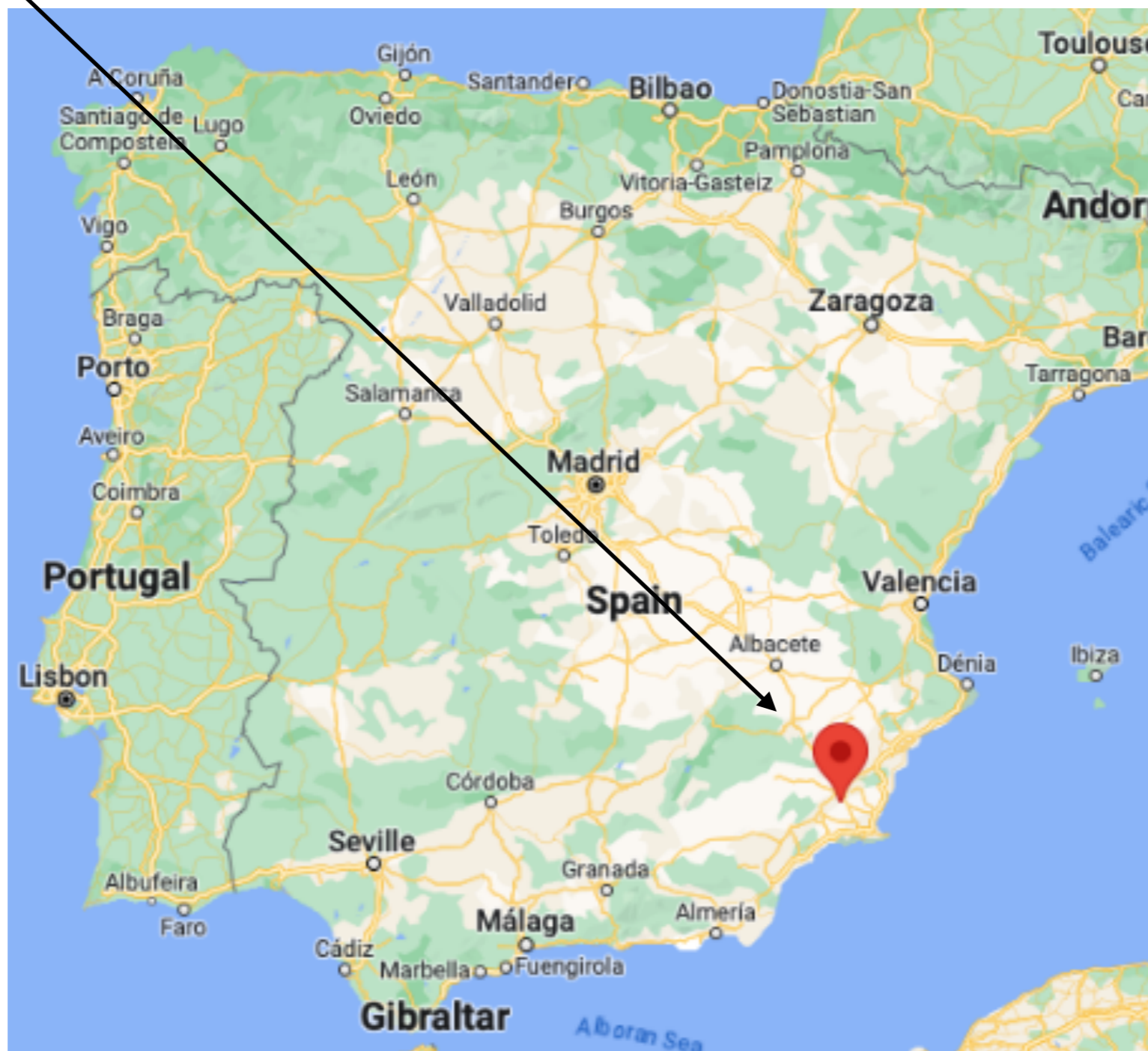
La Sanguijuela (Spanish)

Place Names



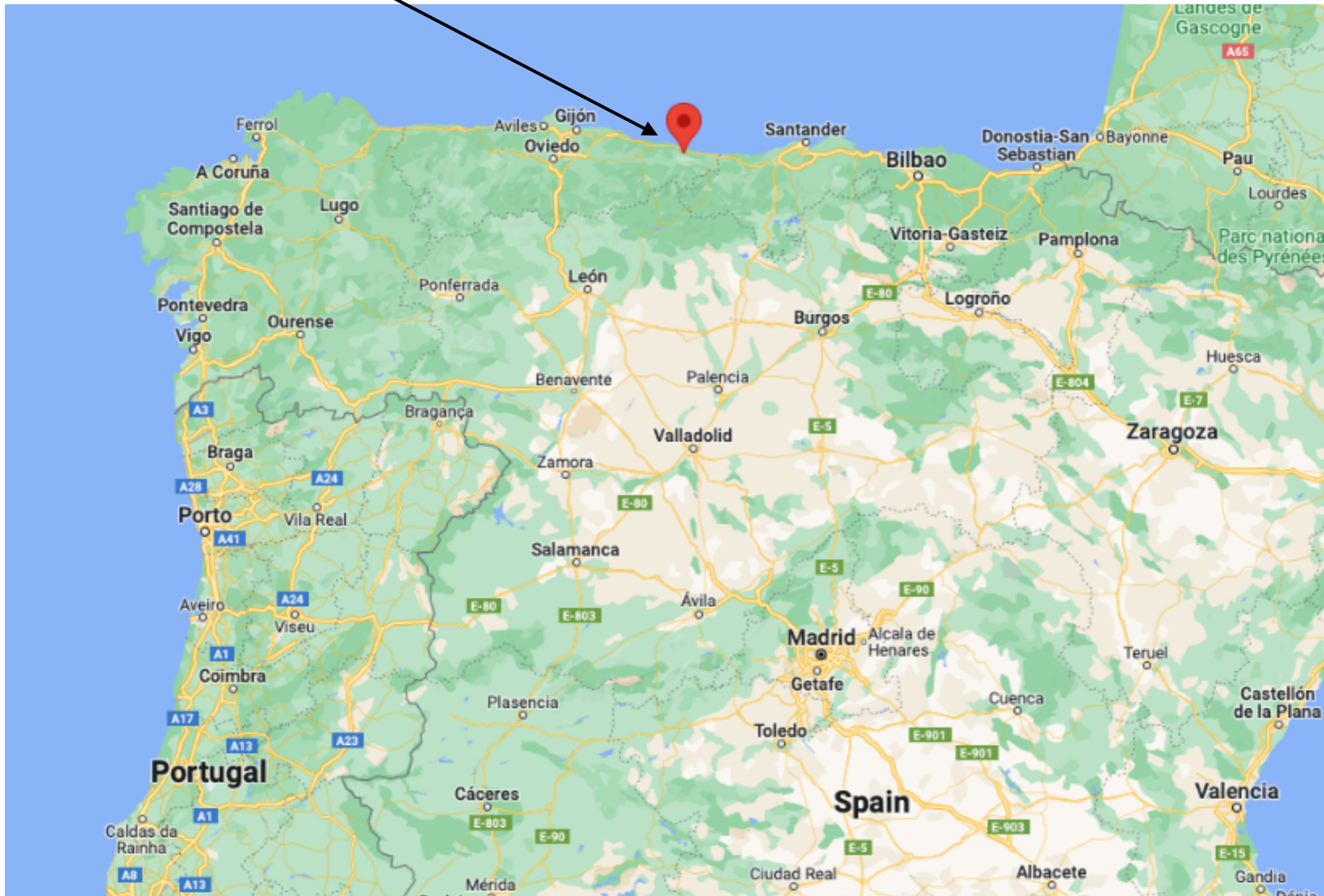
Sangonera la Verde (Catalan)

Place Names



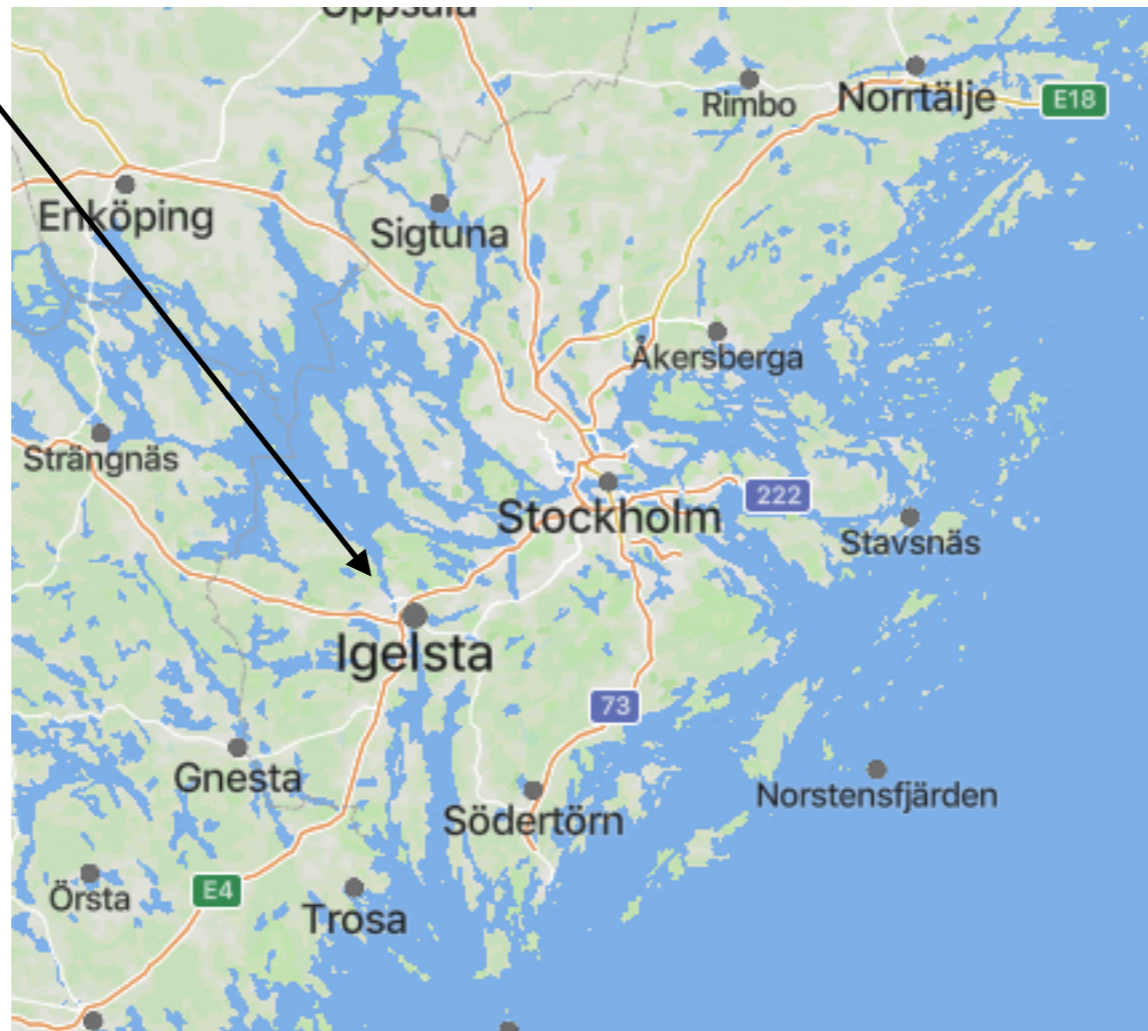
Porrúa (Basque)

Place Names



Igelsta (Swedish)

Place Names



Place Names

*Other examples: Canada, Mexico, and
Papua New Guinea*

*Also looked at: Iceland, Romania,
Hungary, and Germany*

	Ajuda Cod. 52-XIII-26 1470-1479 Bruges	Morgan MS M.165 1440-1450 Ruen	Sloane 2401 15 ^m England (?)	Cambridge li.5.11 14 ^m / 15 ^m France (?)	Sloane 2435 1265-70 Cambrai / Thérouanne	Français 12323 c.1300 France	Arsenal 2510 c.1285 France	Morgan MS M.459 c.1290 Lombardy, It.	Vat. Reg. Lat. 1236 15 ^m (?)	Haenel 3478 14 ^m Paris (?)
Text version:	B (roger mb)	B (roger mb)	B (roger mb)	B (roger mb)	B (classical)	D (mixed)	B (short)	B (classical)	B (roger mb)	B (roger mb)
Aquele chose sansues valent Leeches	f. 27r (xxbij) V. Man sited by a rivor with leeches on his legs	f. 26r (xxij) V. Man sited by a rivor with leeches on his legs	f. 23v (xvij) V. Man sited by a rivor, leeches in the water	f. 21v (xv) V. Man with feet in water and leeches on legs	f. 15v V. Man by the rivor with leeches on his legs	f. 64r V. Man siting, foet on a vessel, leeches in legs	f. 15r Man standing, his foot in the water with leeches in his legs	[page lost]	f. 21v Man seated by the rivor? with leeches on his legs?	illustrated (?)

*Luís Miguel Campos Ribeiro, Picturing
Medieval Health, PhD diss. Universidade
Nova de Lisboa, 2016, p. vxxvii*

Aldebrandino

Sloane MS 2435, fo. 15v



Aldebrandino

Morgan (France, perhaps Rouen, ca. 1440-1450)

MS M.0165 fol. 26r



Aldebrandino
(France,)
Arsenal MS 2510, fo. 15r



Aldebrandino

BA ms 52-XIII-26, fo. 27r



Aldebrandino

Cambridge li.5.11, fo. 23v



Leeches were
everywhere,

'Transformative' Presence

- Widespread technologic changes of waterways during the late Middle Ages, from peat-digging to pool creation along with “weirs, dams and ponds;” there is little doubt that standing water diversion and expansion made developed Western Europe a ripe area for leeches.

Vide: Hoffmann, Economic Development and Aquatic Ecosystems in Medieval Europe, pp. 645ff.

Leech Fishing: Bait

- Leeches known food for some higher predators in the food chain: e.g., fish, birds, snakes, amphibians, and to a lesser extent, insects and snails
- The expansion of market needs for fish altered the waterways and paralleled ditches / ponds / et alia near Paris (leading to French royal regulations)
- Leeches were undoubtedly impacted both with more standing water, and with fewer / varying fish prey / hosts.



Fig. 1 Major fisheries on medieval maritime frontiers

Leeches were
everywhere, but likely
varyingly so

Treatyse of Fysshinge wyth an Angle:

For the Tench: “The tench is a good fish and a leech to all other kind of fish which are hurt, if they come to him.”

Yale University Library Gazette, 1986; 61(1/2): 22-48, p. 42

Theology

in una lona q' calles uisitor' a' statias.
F Qui enim non fuit habitus in terra et simplici
 pes permanebit in ea. Impius uero de terra p
 tentur: qui iniquo agit auferent eum.
 flum: ne obtiniscans legis mee. et pro
 cepta mea custodiat cor tuum. Legisti
 dicit enim dicitur et amare uere et pacem appo
 netur. Odis ueritas non te desit. Circun
 da eas guttur tuo. et desente in tabul' cor
 dis tui. et inuenies gratiam et disciplinam
 bonia cor' et hominib'. Date fiducia i
 dno et toto corde tuo. et ne inuenis pui
 dentie tue. In omnib' uis tuis cogita il
 lum. et ipse diriget gressus tuos. Ne sis sa
 piens apud te ipsum. Time dnm et ree
 ce amalo. Sane uis qui p'p' erit ubi illu
 tuo. et imitatio ossium tuorum. In uocato dno
 d' tua suba. et de primitiis omnium frugum
 tuarum. et implebuntur h'onea tua sacra
 menta. et uno torculara tua redudabit.
 Disapim' d' fili mi ne abicias. nec ce
 ficias ai ab eo compicaris. Que e' dilig
 to compit. hi pat' in filio op'la'at d'. Sic
 ho qui inuocat sapiam. et qui affluit pu
 tentia. Oculi e' acquirunt ei. negotian
 ce. aurum et argenti. Dum et p'uisillum q'
 fruct' ei. Preciosior e' cibus op'ib'. et oia
 q' desiderantur. hinc n' uale' copari. Ho
 g'itudo dicit i' terra ei. qui in sinistra illi
 diuitie et gl'ia. Ne e' uis pulchre. et ces
 semite illius p'actific. Lignum uite est
 hinc qui app'ntentit ei. et qui tenuit
 ei tenet. Ois sapia fundauit t'ra. stabi
 luit oculos p'udentia. Sapia illi cupit
 abyssi. et nites uero q'et'at. fili mi ne
 effluat h' ab oculis tuis. Custodi legem
 atq' consilium. et erit uita d'ic tue. et gra
 tuuab' tuis. Et ablab' fiduciale i' uia
 tua. et p'p' tuis n' impinget. Si commie
 ns n' timeb'. quiescat et suauis est sopi
 tius. Ne pauca' rep'entano' q'ia. et inue
 ces e' p'entans impioy. Ois eni' d'ic la
 te tuo. et custodi p'ce' tui ne capians.
 Noti p'hibe b'nfac' eum qui p'ce' suale
 et ipse b'nfac'. Ne dicas amico tuo uade et
 reuert' et tuas uade. ai statim p'p'is d'ic
 Ne molians amico tuo malu'. ai ille i
 te h'at fiducia. Ne p'entans aduersus h'ic

frustra. cum ipse e' nunc mali fecit. Ne e
 mulcoris h'icem inuista. nec inuenis
 uias ei. q' ab h'icem d'ic e' ois uisitor. et
 ai simplici' finannat' ei. Gestas d'
 in como in pu. Ficta' aut' uisitor' b'n
 dicentur. Illufores ipse deluere. et m'asita
 dabit gra'm. Etiam sapientes p'p'icibus
 stultoy exultat' ignominia. III
Audite fili disciplina' patris uiri. et ac
 tendite ut scias p'udentia. Conu
 lomi tribua' uob'. loq'et' me' ne dereliq
 tas. Nam et ego fili' sui patris mei tene
 lus. et unigenitus coram matre mea. et
 cretat me atq' dicitur. Si sapiat uo
 ba mea cor' tuum. custodi p'cepta mea et
 uines. Possice sapiam. possice p'uden
 tia. Ne obtiniscans n' declines a u'is o'e
 mi. Ne dimittas ei. et astatu te. Dilige
 ei et suabit te. Panapui sapie possice
 sapiam. et in omi' p'p'ic' tua acq'ie
 p'udentia. Impe' illa et exaltabit te. o
 glificans ab ea. cum ei fu'is p'p'ic'at.
 Dabit caput tuo aug'nta' gra't' et d'ona
 in cetera p'p'icet te. Audi filium et susci
 pe u'ba ma. ut multiplicetur t'ra tua uie
 ma sapientie monstrabo t' et g'uedi te
 p' semitas equitans. Quas ai in g'it'is
 fuens n' arrabunt g'it'is tui. et auerens
 n' h'eb' offendiarum. Tene disciplina'
 et ne dimittas eam. Custodi illa q' ipse
 e' uita tua. Ne deleteris in seminis ipio
 ni: nec e' p'p'icet maloy uia. fuge ab ea
 nec transas p' illa. Declina et cetera eu.
 Ad eum committ' n' male facit. nec rap
 p'itur sop'ius n' sup'p'ic'at uent'. Sed uie
 p'p'icet impietatis. et uinu' iniquitatis
 bibit. Iustoy aut' semina. q' lux splen
 des. p'p'icet et astat usq' ad p'p'ic'at d'ic. Na
 ipioy acc'eb'osa nesciunt ubi conuane
 fili mi. au' faulta' smones ipioy. et ad do
 quia ma' inclina' aut' tua. Ne recedat
 ab ocul' tuis. Custodi ea in medio adu
 tu. uita e' s'it' inuenient' ea. et inuue
 se eam' sanctas. Ois custodia sua co
 tuu. q' ex ip' uita p'p'icet. Remone a
 te os p'p'icet. et uita' uita labia. s'it' p'p'
 a te. Ois eni' uita uita. et p'p'icet me
 p'p'icet g'it'is tuos. Dige' semina p'p'icet

in p'p'icet

in uia

in uia

ab eis

Proverbs 30:15-16

[15] The horseleach [sic] hath two daughters, crying, Give, give. There are three things that are never satisfied, yea, four things say not, It is enough:

[16] The grave; and the barren womb; the earth that is not filled with water; and the fire that saith not, It is enough.



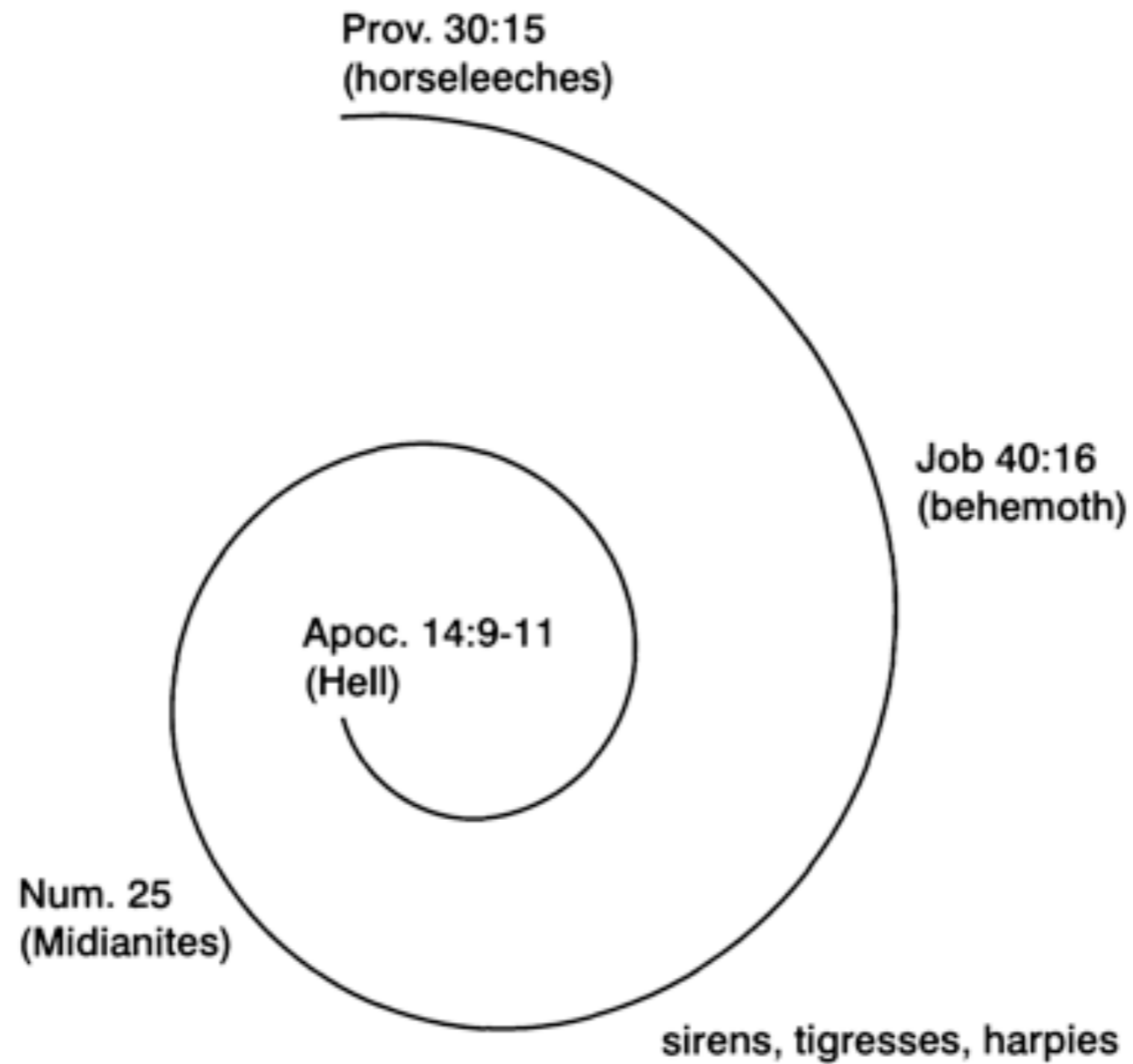
Methodius of Olympus (d. 311)

(De sanguisuga ad Eustochium)

The inherent power of metaphor

“But what is the **true bloodsucking leech**, whose beloved daughters could not be satisfied? Is the prophet’s word about this *visible leech*, and not rather about the inimical power which is never satisfied with **evil**? For it lives in the waters of the intellect, of which the prophet said in the psalms, ‘There is the sea, vast and spacious, teeming with creatures beyond number - living things both large and small. There the ships go to and fro, and Leviathan, which you formed to frolic there.’ *But whose children are hell* and the infernal regions?”

- translated by Ralph Cleminson (2015) [emph. mine]



13) Schematic drawing of Peter Damian's *Letter to Cunibert* (by author).

Theological Appearances from familiarity and metaphor (e.g.)

- Hildebert's (c. 1055-1133) *Sermons*: castigates **greedy tyrants**, like ever-thirsty leeches, eager for the "empty glory" of battle with no remedy available.
- Peter Lombard's (c. 1096-1160) *Sentences*: chides **other commentators** for praise that sucks proper lessons like leeches suck blood from the children of men.
- Peter the Chanter's (d. 1197) *Summa*: decries "detestable men" who have become chamberlains to princes and prelates, populating the Church with their sons, as "the **leeches of princes**," taking from their treasuries to the harm of Church and state.
- Alexander of Hales' (c. 1185-1245) *Summa theologica* (glossing *Proverbs*): "A bloodsucker is the **devil**, who is perpetually burning with thirst to sin and to commit sins."

and Zombies



William of Newburgh (1190s) described four cases (three in southern Scotland, one in Buckinghamshire) of 'zombies,' called Sanguisuga: Animated corpses, able to leave their graves, and only stoppable by excising their heart.

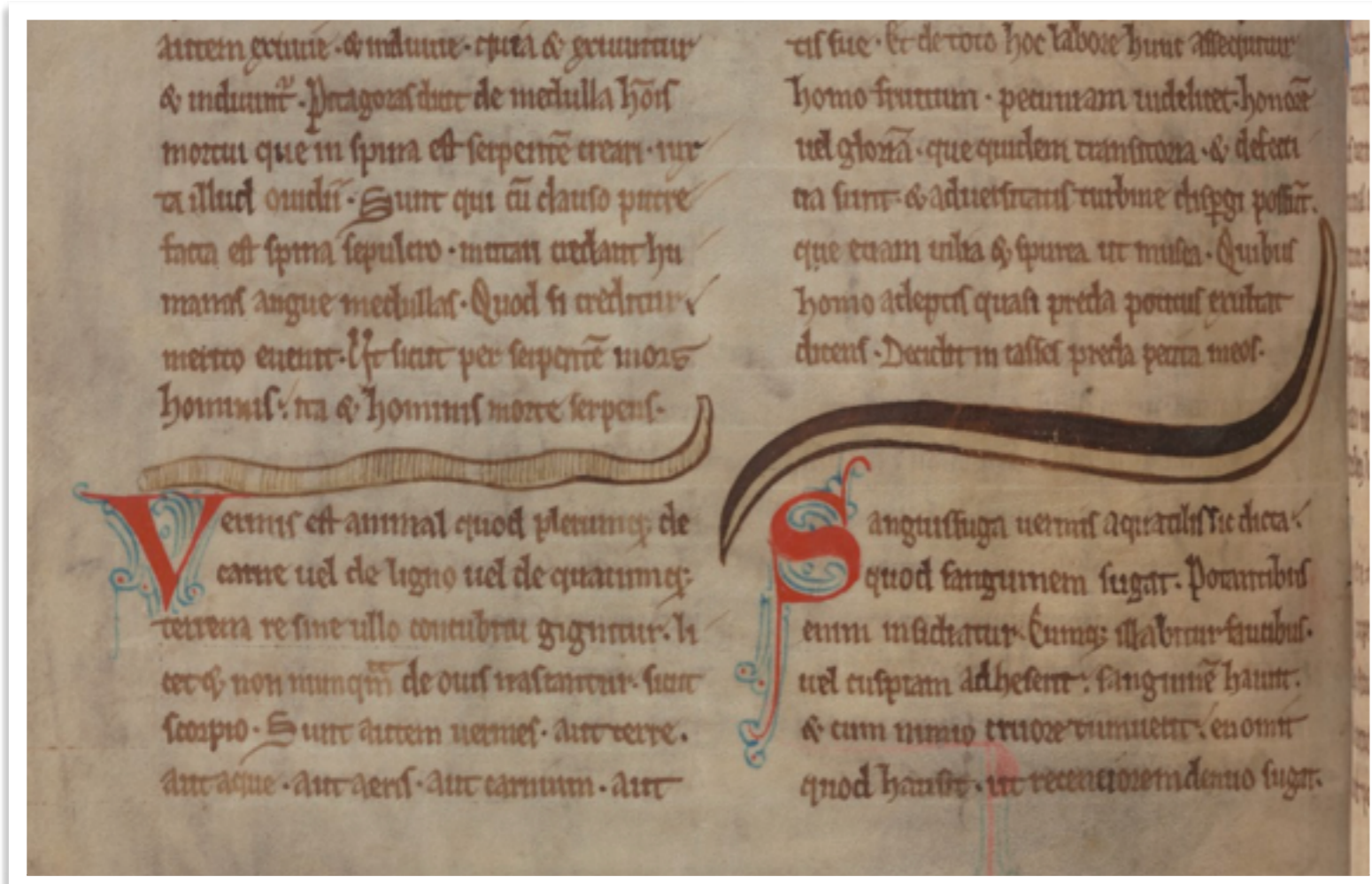
Blair (2009), p. 541

Zoology

- Isidore of Seville
- Hrabanus Maurus
- Albertus Magnus
- Thomas de Cantimpré
- and many others

Bestiaries

Cambridge University Library, Kk.4.25, fo. 97v-98r



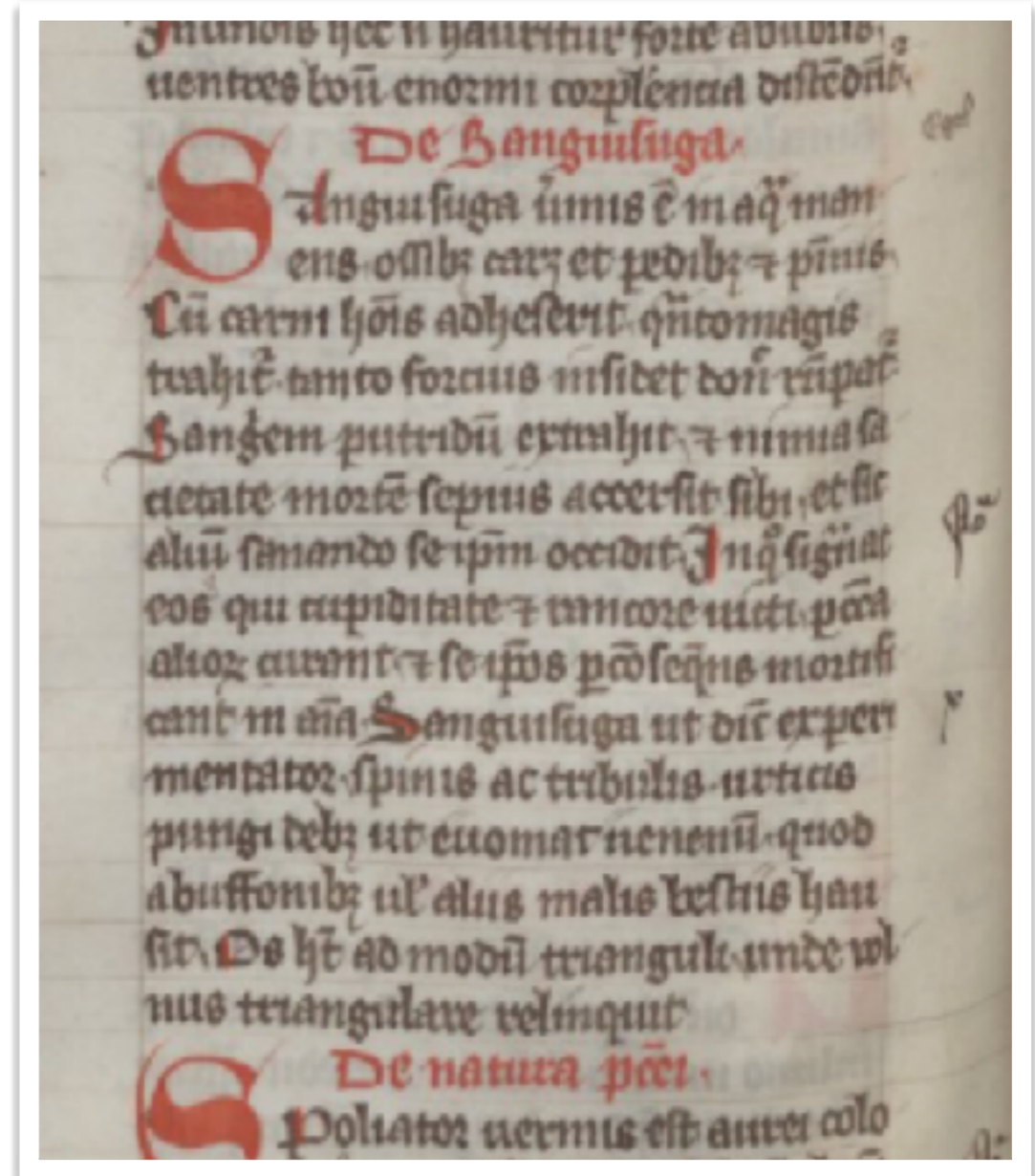
Bestiaries

Tractatus de naturis animalium in XX
libros divisus, quorum tres extremi
desunt

Physiologus cum figuris
pictis (anon.)



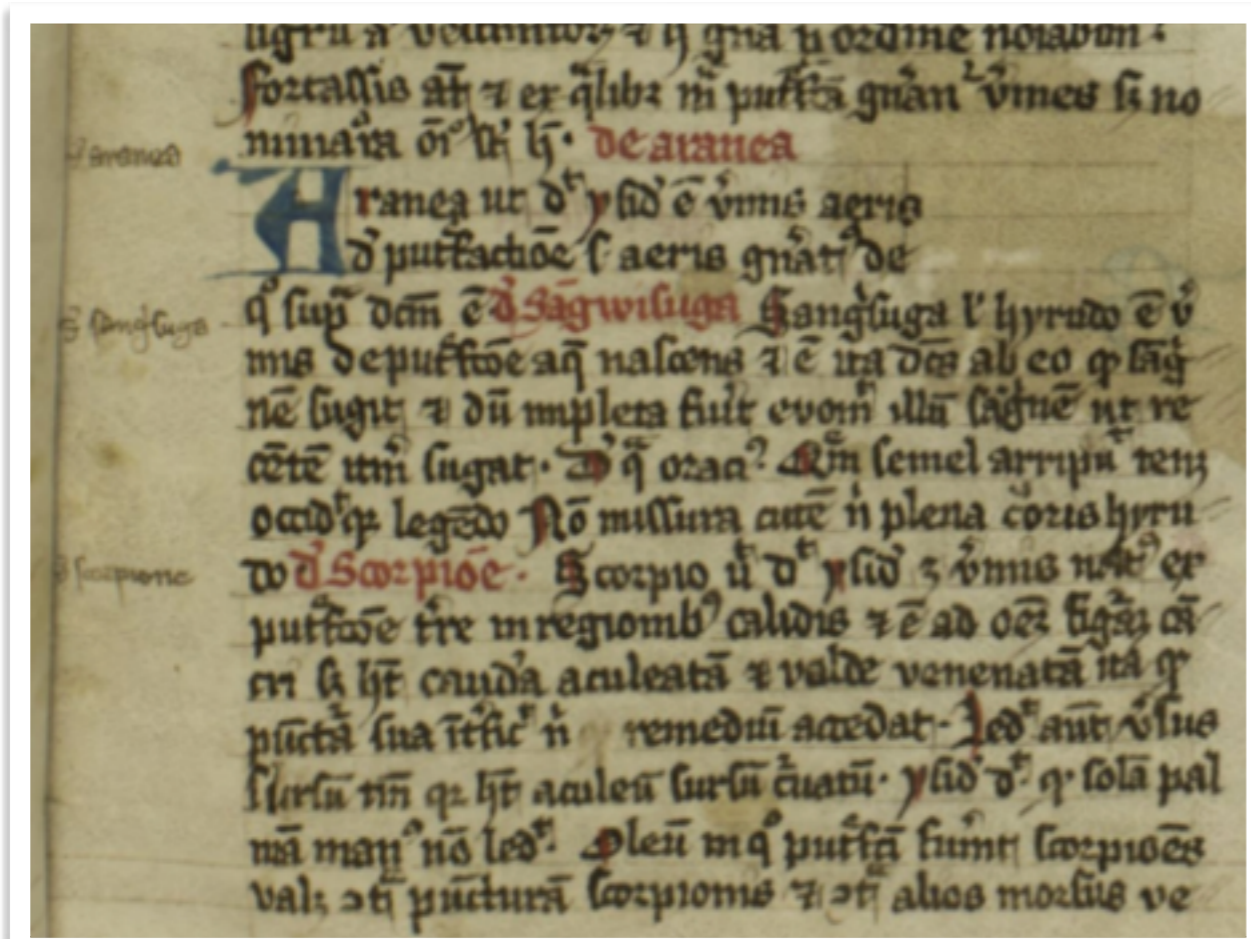
Sloane MS 4016, fo. 85r



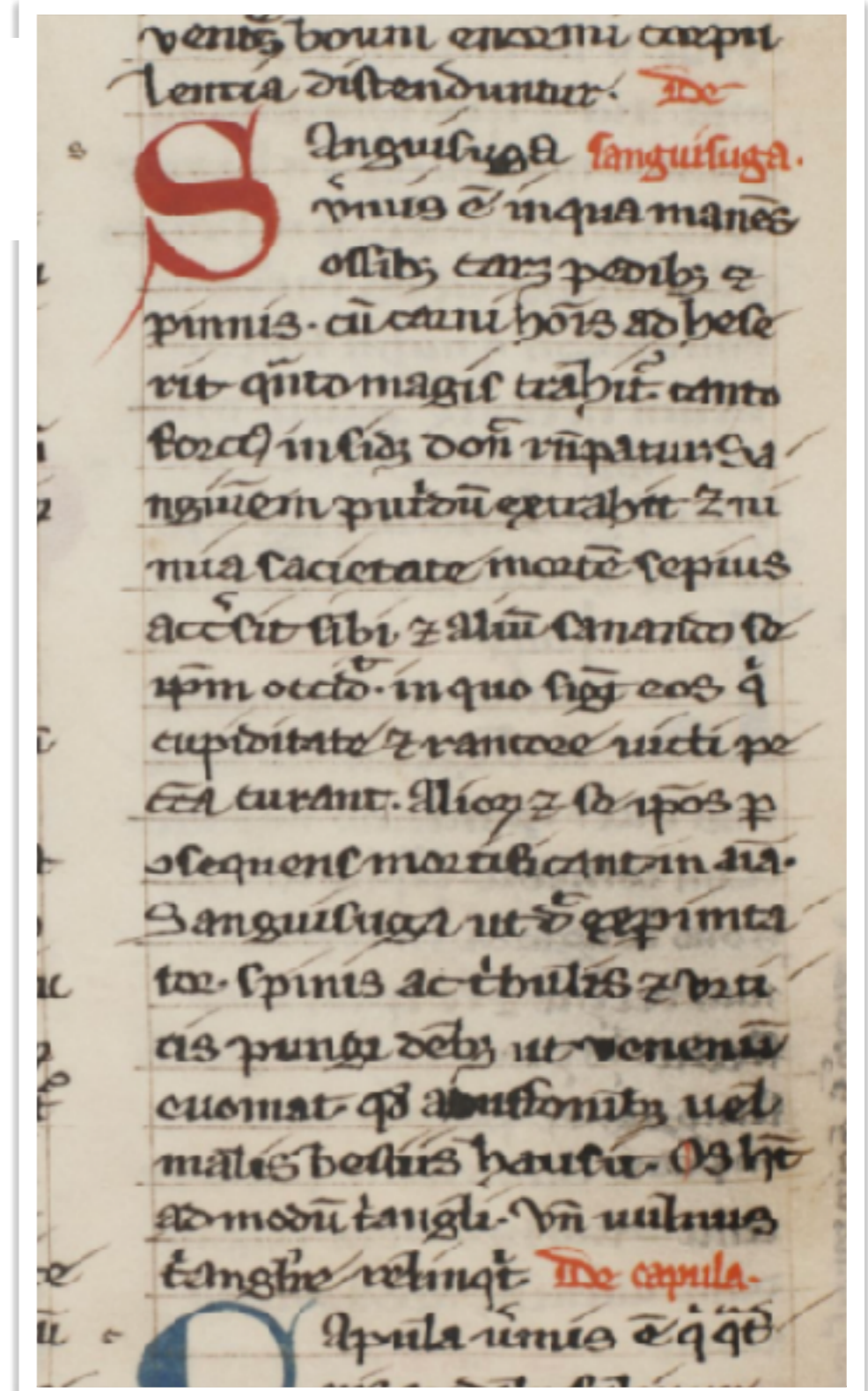
Clm 6908, fo. 35v (xiv s.)

Bestiaries

Engelbert of Admont's *Tractatus de naturis animalium*



Admont, Benediktinerstift, Cod. 119, fo. 40r (xiv s.)



Admont, Benediktinerstift, Cod. 547, fo. 47v (e. xiv s.)

Isidore of Seville

(*Etymologies*, Book 12, 5:2):
Spiders are worms of the air and get their food from the air.
From their body they produce a long thread and they never stop working, but are always kept hanging by their art. (emph. mine)



Koninklijke Bibliotheek, KB, KA 16 (c. 1350)

Worms of: air (spider), earth (beetle), water (leech), clothing (moth), wood (termite), leaves (caterpillar), and flesh (many kinds)



Österreichische Nationalbibliothek, cod.652,
fol. 2v (Fulda, 2nd quarter of the 9th century)

Hrabanus Maurus

- c. 780 - 856, Mainz
- Studied in Tours with Alcuin
- Carolingian scholar, running Fulda's abbey school and training Walfrid Strabo
- *De universo libri xxii., sive etymologiarum opus*



Österreichische Nationalbibliothek, cod.652,
fol. 2v (Fulda, 2nd quarter of the 9th century)

Hrabanus Maurus

- “A *sanguisuga*, an aquatic worm, said to suck blood. For it lies in wait for those who drink. And when it slips down the throat, or wherever it sticks, it draws blood, and when it is sated with too much blood, it vomits out what it has drawn, so that it sucks again fresher.”

Ca. IV. *De vermibus*



Thomas de Cantimpré

De natura rerum

(1201-1272)

- “A leech is a worm that lives in water. It lacks bones and feet and feathers. It attacks man and beasts to suck blood. With whose blood, in its satiety, it brought death too many times. People naturally give themselves to these worms, so that they drink the excess blood of the body. But some are less wise, unless they feel the excessive corruption of the blood. For in a healthy man they extract the nobler and well-digested blood. ... Those are said to be better and more harmless that have wrinkles and lines on their backs; worse indeed are those that are black.”



Thomas de Cantimpré *De natura rerum* (1201-1272)

- “Of these the philosopher Adelinus writes. But the Experimenter says that the leech vomits the blood which it has drunk, in order to drink fresher. [When] it is pricked with nettles and stinging nettles, it **vomits the poison** if it has ingested something from wild animals or toads or water snakes. When it sticks to the flesh, the more it is pulled, the more strongly it sticks until it breaks. It draws putrid blood; it **kills itself by ‘healing’ another**. It has a mouth in the form of a triangle, from which it leaves a triangular wound. The book Kyrannidarum says that if you burn leeches and smear their ashes with vinegar instead of pulling out hairs, they will no longer grow back.”



Albertus Magnus (c. 1193-1280) *preparation*

“The leech is a vermin of the swamp. It is familiar and is so called because it sucks the blood [sanguinem sugat] of animals. There are **many types** of this vermin, but in our lands there are entirely black and smooth ones, and ones that have red stripes on their backs and are a little bit wrinkled. These are the better ones. They do not have feet and no other member is to be seen on them. They are entirely columnar in shape. They are attached to bodies in order to suck out superfluous blood. Since, however, they also sometimes suck on **poisonous creatures**, it is to be feared that they might be **infected with the poison**. They should be cured first in a new pot by being sprinkled with a little salt so that they will vomit forth the poison and afterward they should be fed with a little bit of warm lamb’s blood by having it sprinkled on them and two or three hours after this they are to be put on the body. Some of them are invisible. They are thread-like and are drunk in with water. They cling to the **throats** of humans and animals and cause the blood to flow unceasingly. If the spot to which one clings is covered over with salt, the leech immediately falls off. If the place where it bit pours forth an excessive amount of blood, a leech is to be burned up in a pot and its ashes placed over the spot. This vermin makes a triangular wound. In its **greed** to suck sweet human blood, it spews forth what it has sucked up and straightaway sucks up fresher blood.” (AM-2018, p. 1759)



Br Libr, Add 42130, fo. 26r (c. 1325-1340)



Mulomedicina (1250-1375 ca., Biblioteca Medicea Laurenziana, pluteo 45.19)

Vegetius (l. 4th c.)
*Digesta artis
mulomedicinae*, 4.24

“To the leech:

1. Generally, a leech, that is, a leech, if it has been swallowed with drink and sticks to the throat, will draw blood and include it in its growth, or if it has been swallowed with food: you must touch it with oil and remove it. But if it becomes internal, so that it cannot be removed by hand, insert a cane or pipe with a hole in the throat and pour hot oil through it.”



Acta Medicorum Berolinensium (1719)

A. Cornelius Celsus
(c. 25 BCE - c. 50 CE)

De medicina, 5.27

“If the leech is imbibed,
vinegar must be drunk with
salt.”



Medicine



Hippocrates

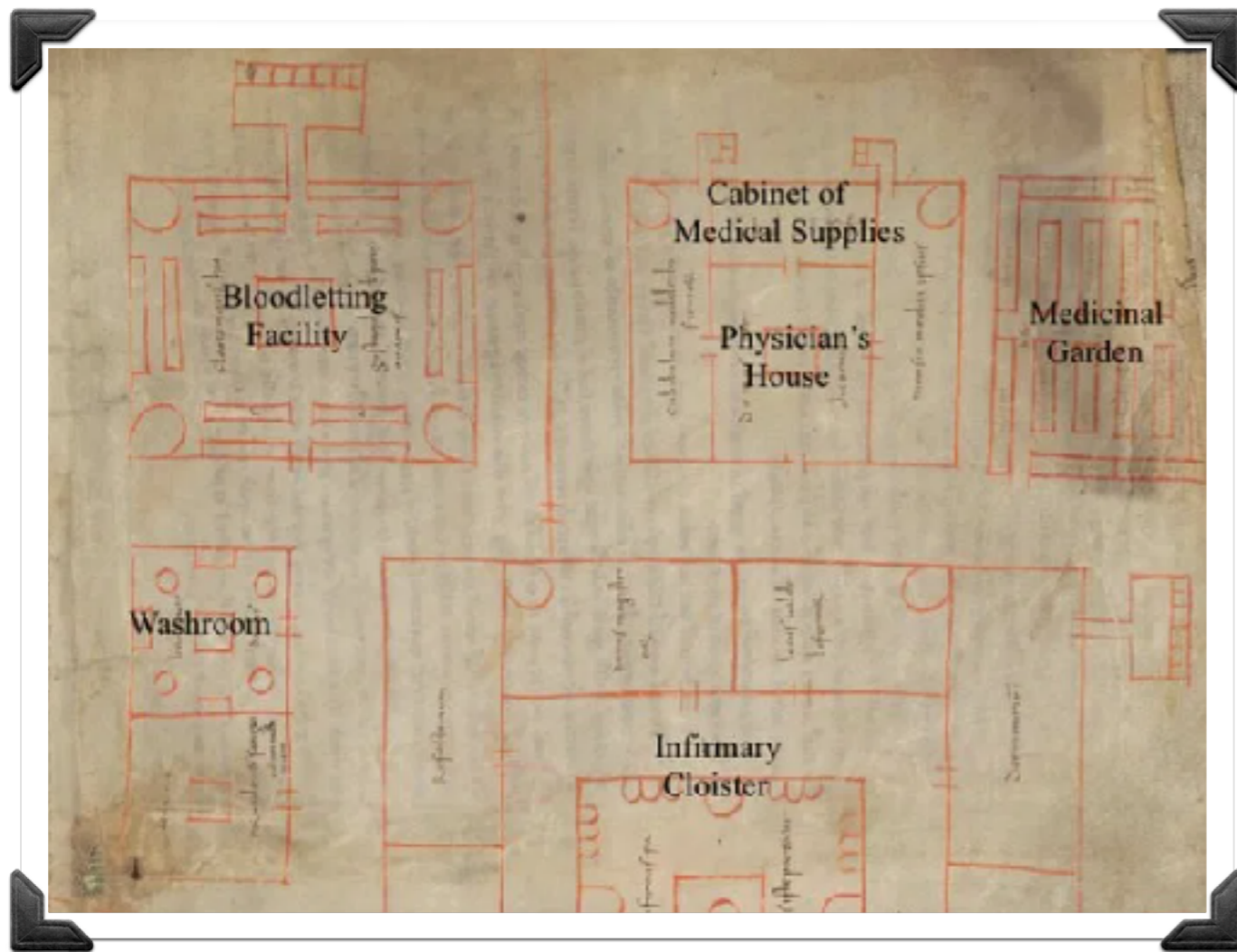
The only locus in the Hippocratic corpus of leeches is *Prorrhetic*, II.17 - blood in the throat may be associated with a hidden leech.

Galen



Juliana Anicia Codex), Byzantine (vi. s.)

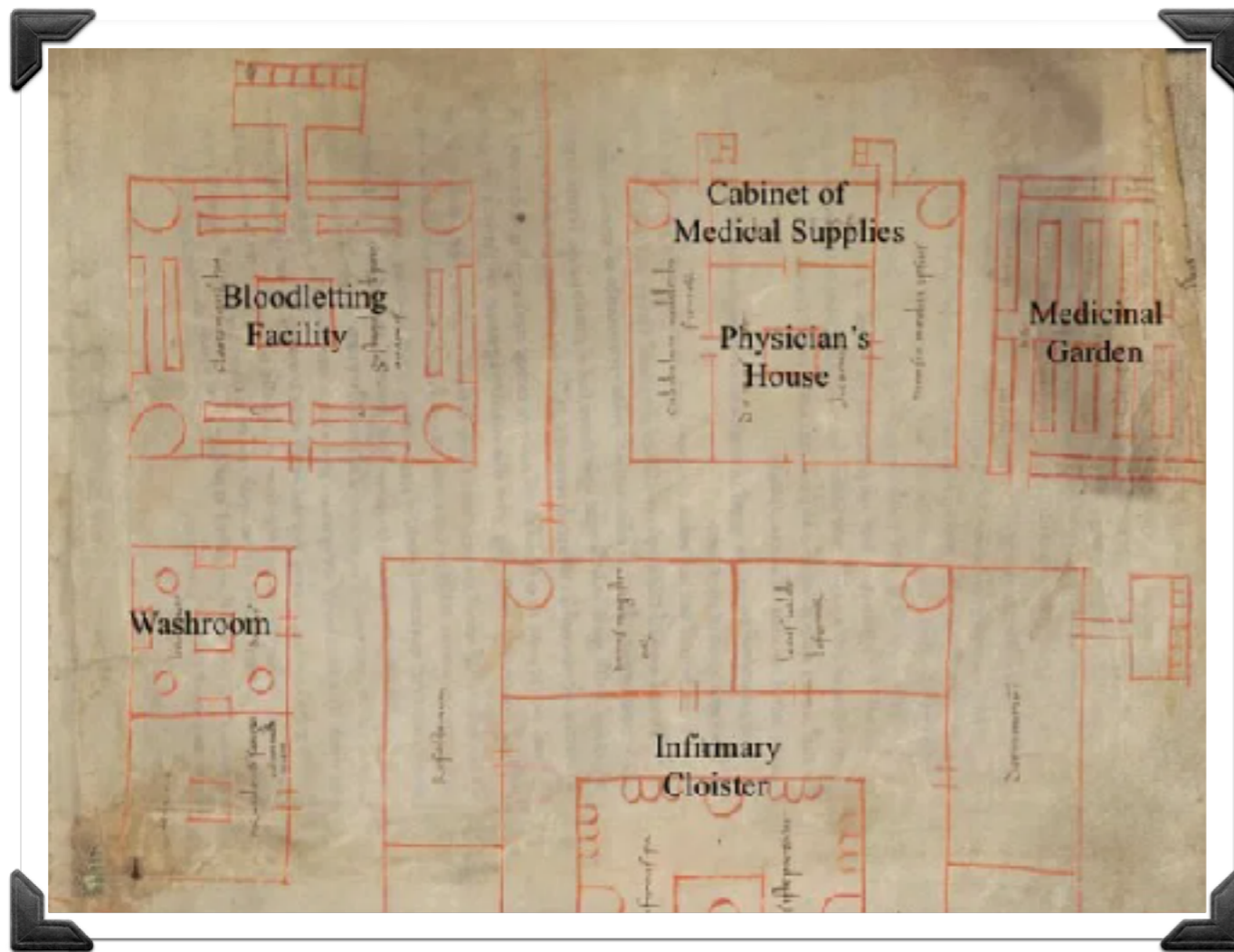
Nicola da Reggio translates (1308 / 1345):
De curandi ratione per venae sectionem



Monastic Life: Rules and the Plan of Saint Gall (820-830) - bloodletting occurred regularly and affected architecture and policies

In Ely, monks were bled six times a year in cohorts; at Barnwell seven; bleeding could be performed in the *dormitory* or *infirmary*; the Benedictines in England had a house in an outer district; at Durham, the blood house floor was paved and “twelve earthen dishes” brought for use at the blood house [disposal?].

Flemming (1928), p. 775



Monastic Life: Rules and the Plan of Saint Gall (820-830) - bloodletting occurred regularly and affected architecture and policies

“From the observation that scarification and leeches were listed as exceptions one can infer that the preferred method of bloodletting for the religious was phlebotomy, or the cutting of a vein...”

Yearl (2005), p. 104

Format

Content

1525

Absorption of Galen

Phlebotomy
Monographs

(1345)

Galen's *De curandi ... venae sectionem*

1325

(1308)

Absorption of Avicenna (& Galen)

Phlebotomy
'Sections'

1250

Avicenna's *Canon*

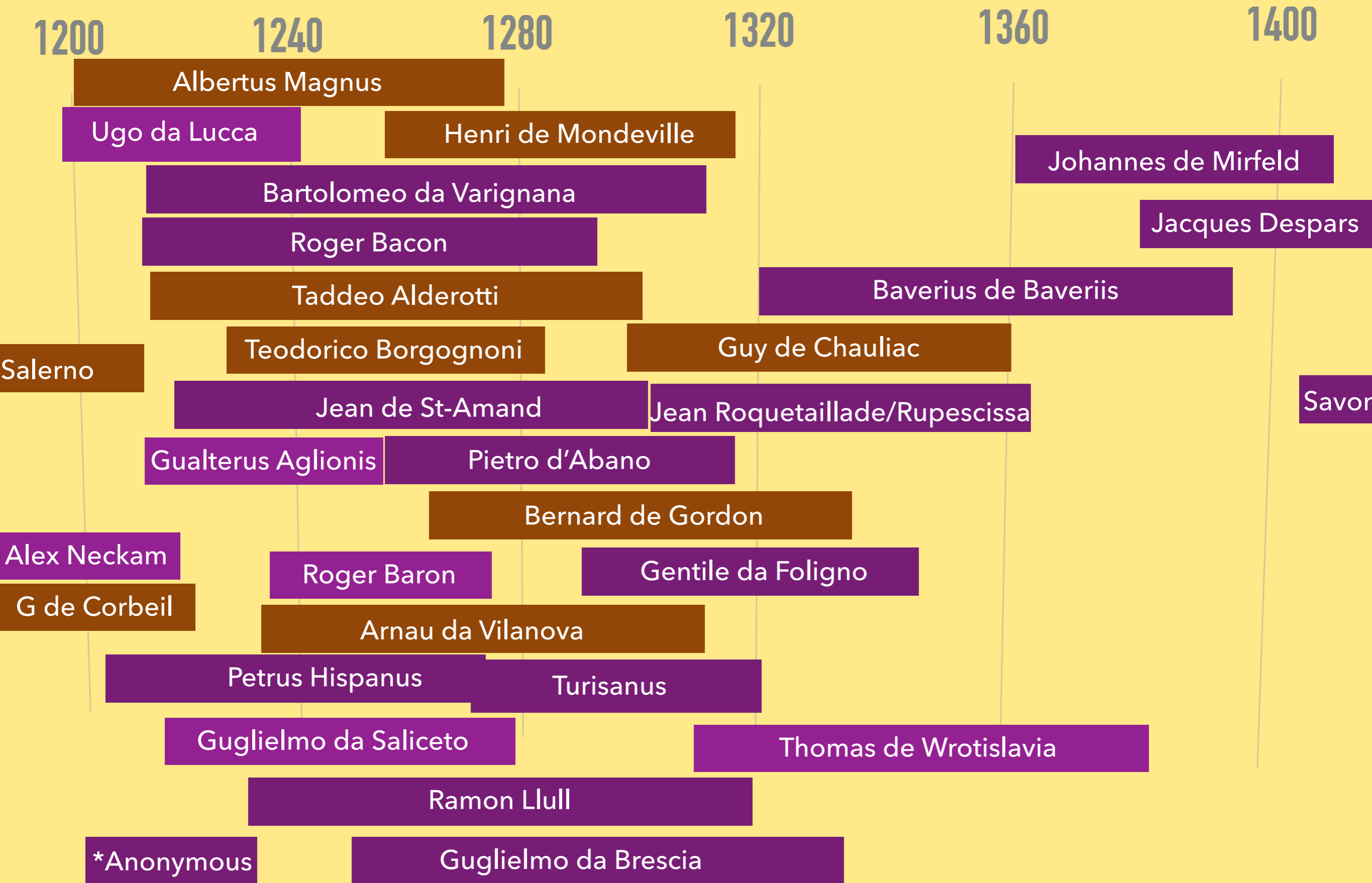
Epistulae de flebotomia
(practical)

(Practical) Derivatives of
ps.-Bede, *De phlebotomia*
Epistola Ypocratis de flebotomia
Reg San Saltnm

500

created from: Yearl,
(2005) and Pedro Gil-
Sotres, "Derivation and
Revulsion" (1994)

LIFELINE OF MEDICAL AUTHORS



Leeches:

- Could be **intrinsically pathological** (lodged in the mouth / throat, or broken off on the body - ? 'infection'), and so needed to be **treated as pathologies**

Galen

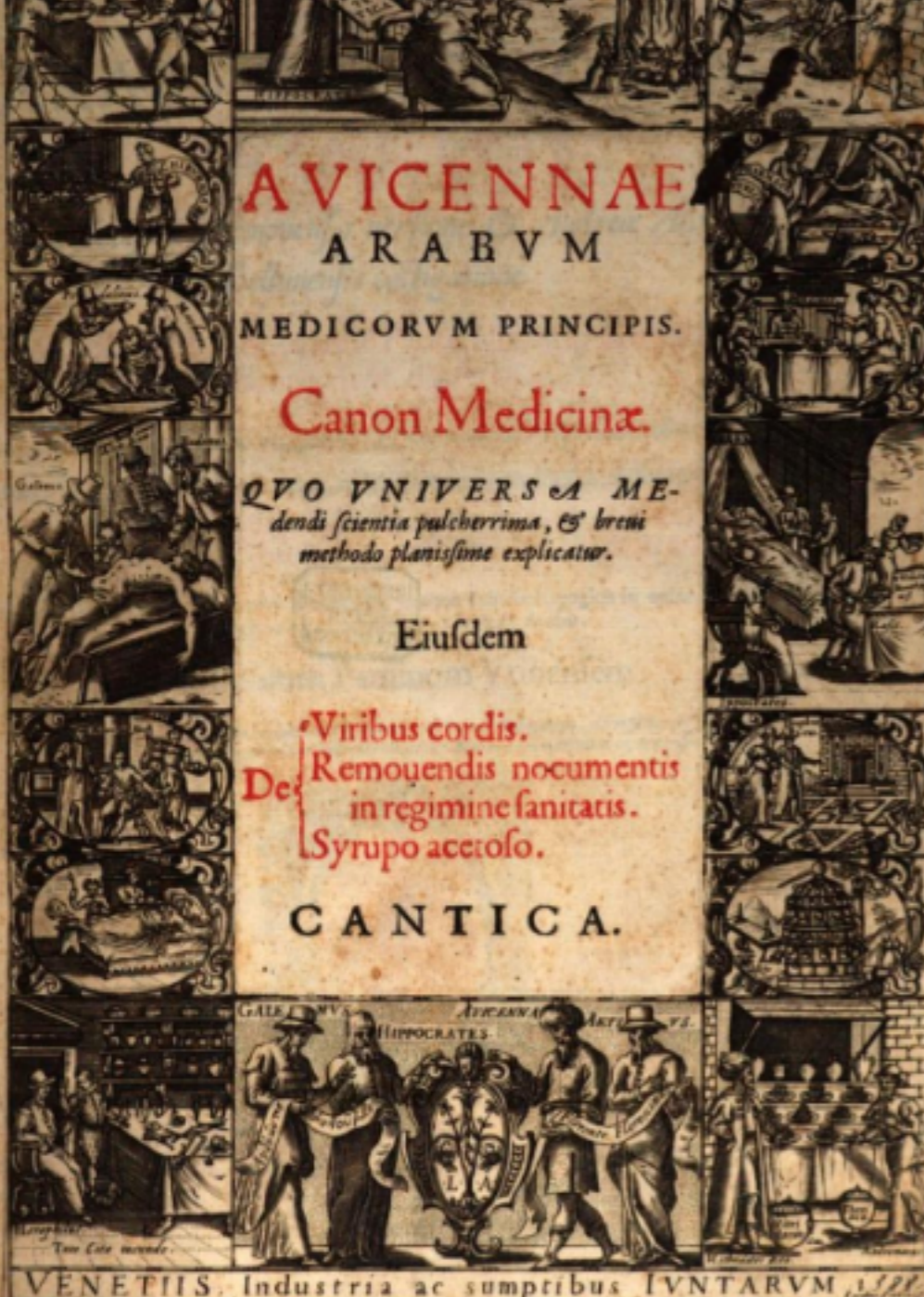
“I once observed a man ... perfectly healthy vomiting blood.... he had drunk water from a certain well ... not entirely pure.... I asked him further whether leeches had ever been seen in the water.... they had been ... I gave him the appropriate medicine and made him vomit the leech.” 120,8.265-6K



Juliana Anicia Codex), Byzantine (vi. s.)

Leeches:

- Could be **intrinsically pathological** (lodged in the mouth / throat, or broken off on the body - ? 'infection'), and so needed to be **treated as pathologies**
- Increasingly from the mid to late 12th century could be of a **poisonous variety**, requiring **knowledge** to distinguish the (in)appropriate, *echoing* what was happening in **pharmacologic medicine** at the time, and so needed to be treated as vectors



- Sources information from India and from Galen
- **Some leeches are poisonous:**
 - Avoid: large heads, dark blue to black or green, hirsute bodies, eel-like, azure stripes, chameleon-like, red bellies / green backs; dirty / muddy water
 - Prefer: mixed colors, green, light / dark brown, round sides; better from algal water or with frogs
 - Poisonous can cause **swelling**, fainting, bleeding, fever, **paralysis**, ulcers

Leeches:

- Could be **intrinsically pathological** (lodged in the mouth / throat, or broken off on the body - ? 'infection'), and so needed to be **treated as pathologies**
- Increasingly from the mid to late 12th century could be of a **poisonous variety**, requiring **knowledge** to distinguish the (in)appropriate, *echoing* what was happening in **pharmacologic medicine** at the time, and so needed to be treated as vectors
- Could be used **therapeutically** as a **derivative** (ground up)

Leech ointment as lice repellent:

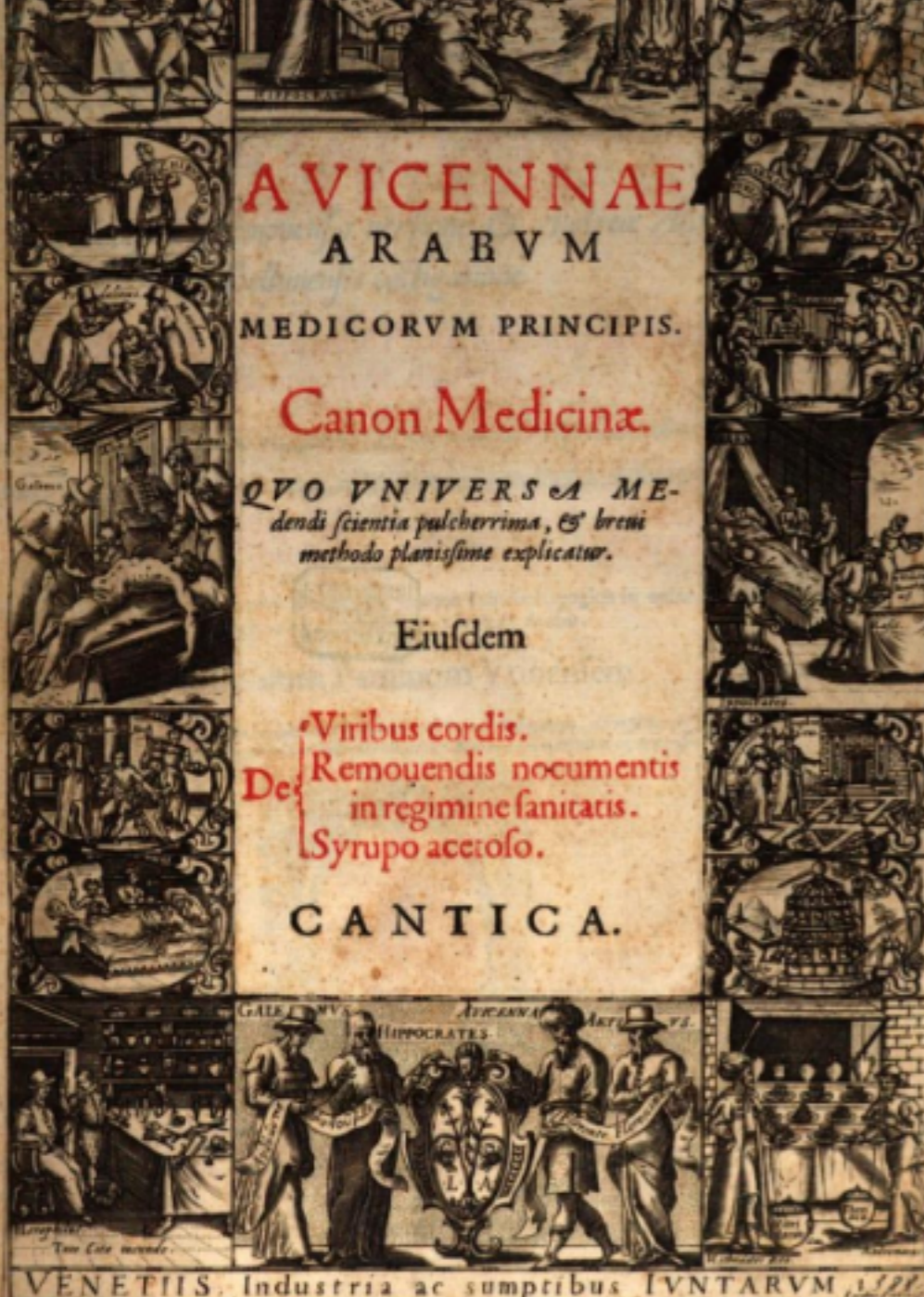
“...take the usual storax and *sanguisuga* charred and mixed with ash and pork fat; that will kill lice and bugs and all vermin growing on the human body.”

Jill Webster, Medieval Catalan Folklore: (excerpts from the Works of Francesc Examenis, 1327?-1409 (U St Andrews, 1982), p. 25

Leeches:

- Could be **intrinsically pathological** (lodged in the mouth/throat, or broken off on the body - ? 'infection'), and so needed to be treated **pathologies**
- Increasingly from the mid-19th century could be of a **poisonous** nature requiring **knowledge** to determine (in)appropriate, *echoing* what was happening in **pharmacologic medicine**, and so needed to be treated (by **doctors**)
• Could be used **therapeutically** as a derivative (ground up)
- Could be used to treat within **humoral** medicine

Required Preparation



- Sources information from India and from Galen
- Some leeches are poisonous:
 - Avoid: large heads, dark blue to black or green, hirsute bodies, eel-like, azure stripes, chameleon-like, red bellies / green backs; dirty / muddy water
 - Prefer: mixed colors, green, light / dark brown, round sides; better from algal water or with frogs
 - Poisonous can cause swelling, fainting, bleeding, fever, paralysis, ulcers

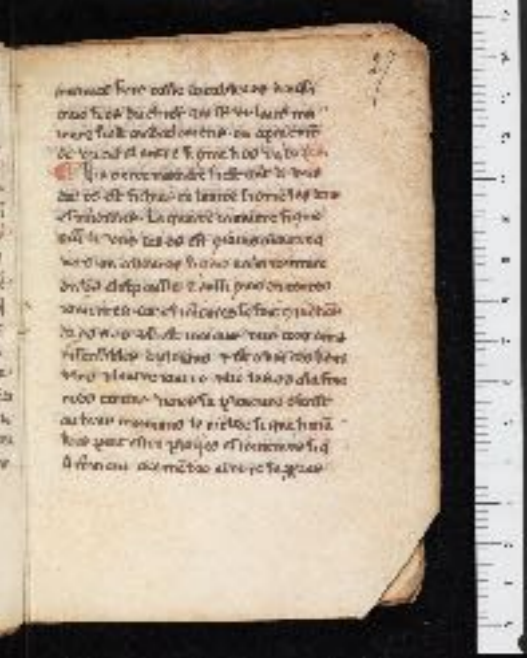
- Leeches draw deeper blood than cupping
- Bring in the day before and hang upside down (empty the belly) then feed on lamb blood; clean with sponge
- Clean skin with borax and massage until red
- Can release with salt, ash, borax, linen / sponge / wool ash

Theodoric of Lucca (c. 1205-1296/8)

- Bishop of Cervia
- Surgeon

“We have nevertheless presented the treatment of the ancients because leeches cannot always be found everywhere.”

(Campbell, III.18; also, II.69-70)



Bern, Burgerbibliothek,
Cod. A 95.2, f. 27r

Lanfranc of Milan (c. 1250–1315) distinguished the average from the expert surgeon by way of a list of interventions, the last being leeching: “I consider the last [application of leeches] to be a surgical activity ... although we prideful surgeons have abandoned it to barbers and female practitioners.”

Cyurgia Guidonis de Chauliaco, et cyurgia Bruni, Teodorici, Rolandi, Lanfranci, Rogerii, Bertapalie (n.p.: Noviter Impressus, 1519), fo. 168v

'THE NEW GALEN'

**TADDEO ALDEROTTI
(BOLOGNA)**

**JEAN DE SAINT-AMAND
(PARIS)**

**ARNAU DA VILLANOVA
(MONTPELLIER)**

- AVOMO iv, p. 67: “Another way to modify the treatment reducing its effects is by ... the doctor ... replacing the universal evacuation with other less debilitating ones, such as scarification or the application of suction cups and leeches - treatments that are all much **less aggressive.**”
[emph. mine]

**Practical medicine
from Salerno to the
Black Death**

edited by
LUIS GARCÍA-BALLESTER,
ROGER FRENCH,
JON ARRIZABALAGA &
ANDREW CUNNINGHAM

Kitab al-tibb al-qastali al-maluki (*Book of Regal Castilian Medicine*), Madrid Biblioteca Nacional, Arabic MS, no. 601, fos. 1r-38v

A Jewish medical author in early 14th-c. Castile

“The fourth chapter (fols. 23r-24r) ‘deals with the application of cupping-glasses, scarification and leeches in Castile’ (fol. 23r), special attention being devoted to the techniques ... as applied to children and adolescents.”

Luis García-Ballester (1994), pp. 353-94 at p. 379

There was a wide variety of **conventional** conditions treated humorally with leeches

There was a wide variety of **conventional** conditions treated humorally with leeches

But they were also used in **liminal** conditions, like: **cosmetic** practices, such as removing freckles and moles, and even in **dentistry** to treat gum disease.

Leeches:

- Could be **intrinsically pathological** (lodged in the mouth/throat, or broken off on the body - ? 'infection'), and so needed to be treated as pathologies
- Increasingly from the mid to late 12th century could be of a **poisonous variety**, requiring **knowledge** to distinguish the (in)appropriate, *echoing* what was happening in **pharmacologic medicine** at the time, and so needed to be treated as vectors
- Could be used **therapeutically** as a derivative (ground up)
- Could be used to treat within humoral medicine
- Sometimes as a treatment of **last resort**

- Gilbertus Anglicus (c. 1180 - c.1250): (Getz, p. 12)
- For **frenesy**: "... And lete him be let blode in þe v[e]yne þat is in þe myddil of þe foreheed. And let him streyne his neck / þe while with a towal. And if he blede not ynowe, take a watir leche and kit of his taile, and do him in þe muddil of his foreheed above þe nose or on þe templis bisidies þe y3en."

Taddeo Alderotti 'Consults' Consilia

Multiple layers of attempted treatment, but, “if the hemorrhoids are not opened then, apply a leech;.....”

Taddeo Alderotti, *Consilia LXII*
(Giorgi/Pasini, pp. 298-310)

Thus leeches were used widely and
as treatments of last resort
... **but also as a Prognostic metaphor**

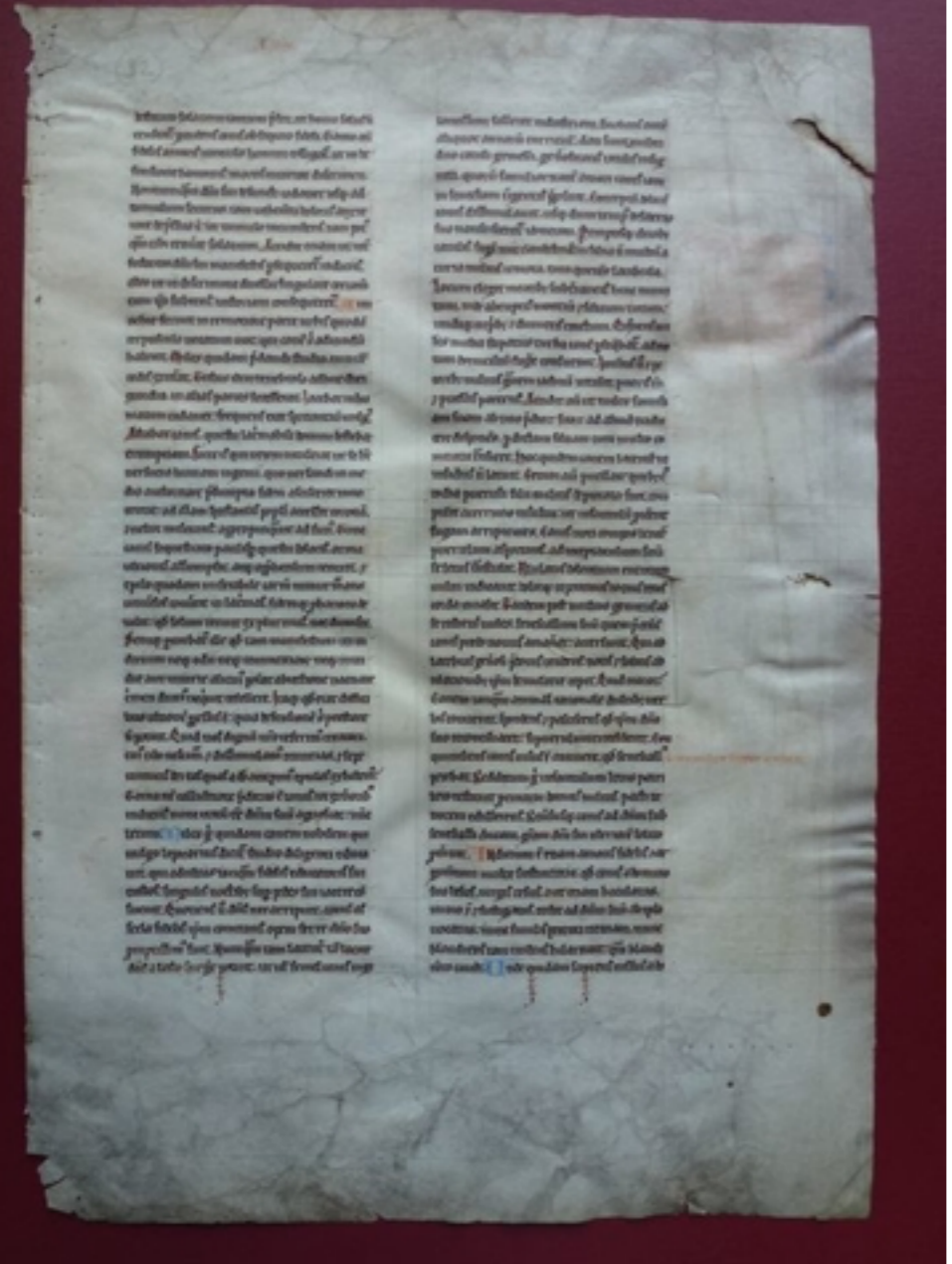
For it must be understood that black *egestio* can arise from many different causes, so that black *egestio* is only due to two things, either because of mortification or because of a mixture of both. If because of mortification and chilling, as when the blood is chilled in the liver and cannot penetrate to the limbs and flows to the intestines and it is the color of a leech. [emph. mine]

Bernard de Gordon, *Prognostics*, p. 334-6

Conclusio

Alexander Neckham

- 12th-century intellectual, in Paris
- Describes a plague of leeches in Naples.
- The medieval necromancer, Virgil, recommends making a golden leech and putting it in a well.
- The citizens do so; the leeches leave; then later the citizens remove the gold; the leeches return!



Conclusion:

Leeches 'keep coming back'
and their history is much
'deeper'

Disability History: A Series

*(edited with Julie Anderson for
Manchester U Press)*





Premodern Health,
Disease, and Disability
*(edited with Wendy
Turner and Christina Lee
for Amsterdam U Press)*

Thank You!



Conclusion. Our preliminary investigation suggests that the presence of FQ and SXT resistance in leech-related *Aeromonas* might be more common than previously suspected, and that such resistance might originate from a common source. A broader study of the molecular epidemiology of leech-related *Aeromonas* is warranted.

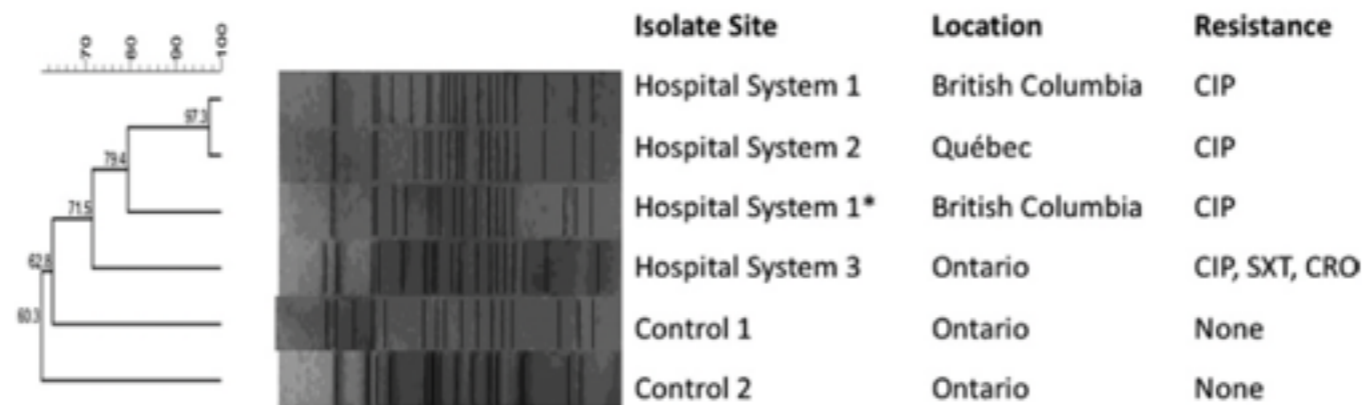


Figure 1 – *Aeromonas* Typing by PFGE

CIP = ciprofloxacin; SXT = trimethoprim-sulfamethoxazole; CRO = ceftriaxone

*Two isolates from hospital system 1 were submitted each derived from the same clinical specimen.

1144. Modern Problem, Medieval Cure-Resistant *Aeromonas* in Medicinal Leeches

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BRADFORD COUNTY

Beagle Busts Man Accused of Smuggling 5,000 Leeches at Toronto Airport

The beagle sat down next to the Canadian man at Toronto Pearson International Airport on Oct. 17, 2018, and the jig was up. Clued in by the dog, officials searc...