La *Fabrique* de Vésale
et autres textes

Éditions, transcriptions et traductions
par Jacqueline Vons et Stéphane Velut

Introduction to Book I

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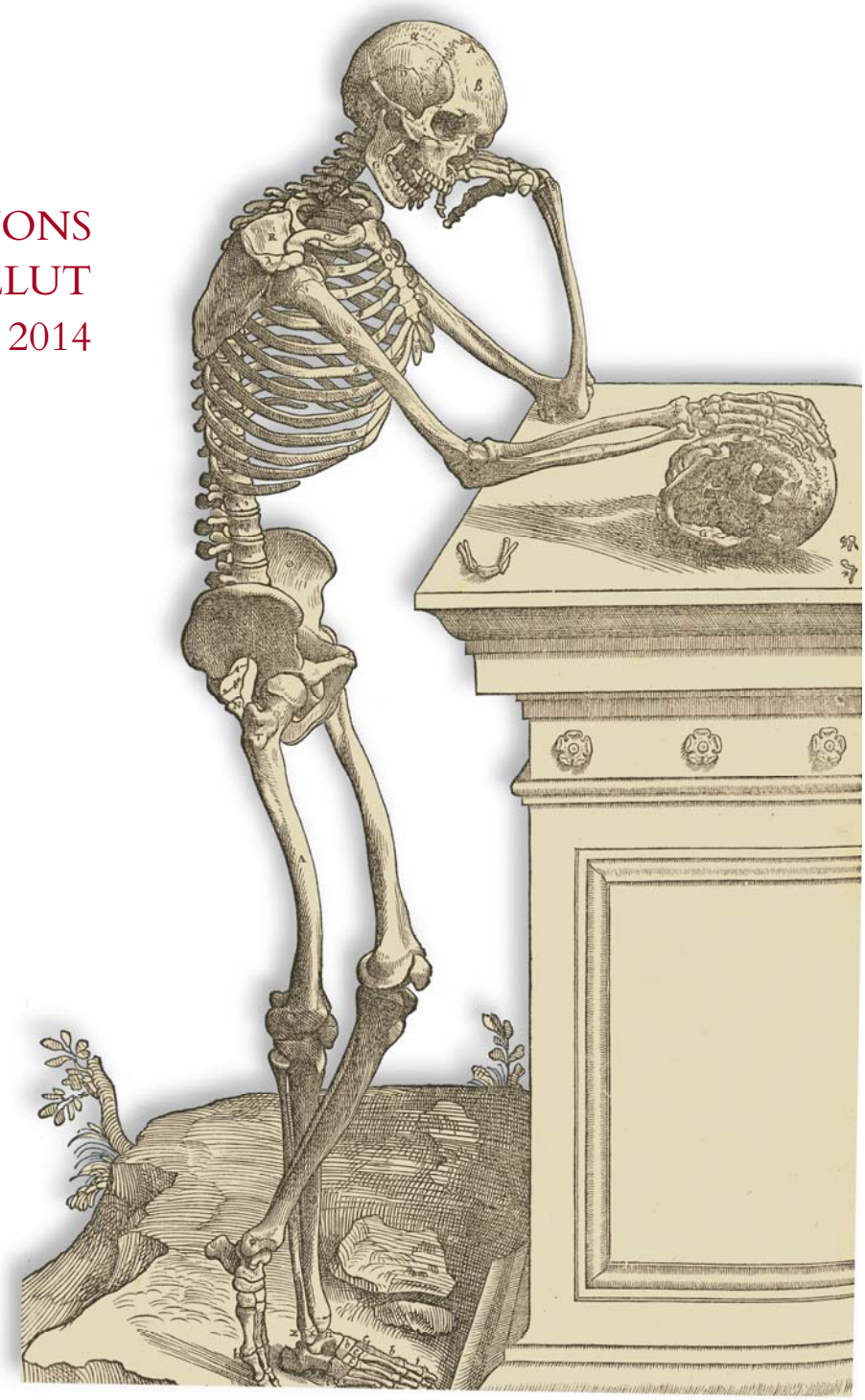

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Contents

No author before Vesalius, or contemporary to him, had ever produced as detailed a description of all the bones and cartilages in the human body as he did, in 168 pages and 40 chapters, thus giving rise to the "creation" of the skeleton-man.

Outline of Book I

The 40 chapters of various lengths that constitute Book I are distributed in the following manner:

Chapters 1 to 4: Generalities and terminology

Chap. 1 The nature, use, and characteristics of bone (p. 1-3),
Chap. 2 The nature, use, and characteristics of cartilage (p. 3-5),
Chap. 3 The names of the bones and of their various parts (p. 5-11),
Chap. 4 The articulations of the bones (p. 11-17),

Chapters 5 to 13: Head and neck

Chap. 5 The structure of the head (p. 17-19),
Chap. 6 The eight bones of the head and the sutures connecting them (p. 20-32),
Chap. 7 The *zygoma* bone (or jugal bone) and the bones resembling a rock (p. 33),
Chap. 8 The ear ossicles (p. 33-35),
Chap. 9 The bones of the upper maxilla (p. 36- 43),
Chap. 10 The lower maxilla (p. 43-44),
Chap. 11 The teeth (p. 45-47),
Chap. 12 The foramina of the head and the upper maxilla (p. 47-55),
Chap. 13 The hyoid bone (p. 55-56)

Chapters 14 to 28: thorax, trunk and upper limbs

Chap. 14 The spine and its various bones: generalities (p. 56-59),
Chap. 15 The vertebrae of the neck or cervix (p. 60-71),
Chap. 16 The vertebrae of the thorax (p. 71-77),
Chap. 17 The lumbar vertebrae (p. 77-79),
Chap. 18 The sacral bone and the coccyx (p. 79-85),
Chap. 19 The bones of the thorax: sternum and ribs (p. 85-93),
Chap. 20 The cartilaginous substance which is at the base of the heart (p. 93-94),
Chap. 21 The scapulæ and the acromion (p. 94-100),
Chap. 22 The clavicles (p. 101-102),
Chap. 23 The arm bone or humerus (p. 103-107),
Chap. 24 The bones of the forearm: ulna and radius (p. 108-115),
Chap. 25 The carpus (p. 115-119),
Chap. 26 The metacarpus (p. 119-121),
Chap. 27 The digits of the hand (p. 121-125),
Chap. 28 The sesamoid bones (p. 125-126)[1],
Chap. 29 The bones attached to the sides of the sacrum (p. 127-132).

Chapters 30 to 33: the lower limbs

[1] This chapter follows that which is devoted to the sesamoid bones in the *Epitome*.

Chap. 30 The thigh bone: femur (p. 132-135),
Chap. 31 The leg bones: tibia and fibula (p. 136-141),
Chap. 32 The patella (p. 141-142),
Chap. 33 The tarsus and metatarsus (p. 142-149).
Chapters 34 to 38: nails and cartilages
Chap. 34 The nails (p. 149-150),
Chap. 35 The cartilages of the eyelid (p. 150),
Chap. 36 The cartilages of the ear (p. 150),
Chap. 37 The cartilages of the nose (p. 151),
Chap. 38 The cartilages of the larynx and the *trachea* (p. 151-155).
Chapter 39 Preparing bones and cartilages for inspection (p. 155-162),
Chapter 40 Total number of bones in the human body (p. 162),
Three plates of complete skeletons, along with their index (p. 162-168).

The text sources mentioned in Book I

In spite of the titles chosen for their works, neither Hippocrates (*On the Nature of the Bones)* nor Galen (*Bones)* had provided so many details on the structure, nature or structural relationships of the bones, disregarding all the other constituents of the human body. Beginning an anatomy treatise with the bone structure of the body, *i.e.* by its innermost part, or reversing the order in which a dissection takes place, constituted both a return to Antiquity and a novelty that modern authors would use again. The *Epitome* or *Summary* of the seven books of the *Fabrica* feature the same descriptive sequence as that of the *Fabrica*. What seems to be obvious today was certainly not in the middle of the 16th century. How can we account for the novelty of this presentation compared to that used by other authors contemporary of Vesalius? In our introduction to *Epitome*[2], we have shown that the description of the body in the anatomical treatises of the Renaissance followed a few ordinary patterns, oscillating between a chronological presentation of the opening of the body by cavities (or stomachs), according to a protocol defined by the decay rate of the organs they contain or by their hierarchy in the philosophical order[3], or according to philosophical criteria dividing the body into similar and dissimilar parts[4]. The only significant variants from this procedure are those that were more or less simultaneously introduced by the French anatomist Charles Estienne (1504–1564), author of the treatise *De dissectione partium corporis humani libri tres,* published in 1545, and by Vesalius. Both had attended the lectures given by J. Guinter d'Andernach in Paris, and both started their description of the body (*corporis historia*) with the skeleton, which structures the body, following the natural order recommended by Galen in the first book of the treatise *On Anatomical Procedures* (*De anatomicis administrationibus*).

Ancient text sources are mentioned several times in the outer margins of Book I of the *Fabrica*, and a number of references are also merely referred to, explicitly or implicitly, in the descriptive text. Among the Greek sources figure prominently "the divine Hippocrates" and his books on articulations or fractures; Galen, "the prince of anatomists," with his already mentioned *Anatomical Procedures* (*De anatomicis administrationibus*), his book *On the Use of Parts* (*De Vsu partium*)[5], the *Commentaries* on the Aphorisms of Hippocrates, and even more the treatise on *Bones* (*De ossibus);* but also the Aristotelian treatises, *On the Motion of Animals (De motu animalium), The History of Animals (De animalium historia),* and *On the Parts of Animals (De animalium partibus).* However, no reference to any specific edition of these texts is given. Copies of treatises by Hippocrates and Galen featuring Vesalius' signature have been rediscovered, but they are posterior, or do not bear directly on osteology. Such is the case of three treatises by Galen on breathing *(De causis respirationis, De utilitate respirationis, De difficultate respirationis)*, edited by J. Cornarius and published jointly in Basel in 1536 by Froben, or, again published by Fro-

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2 J. VONS and S. VELUT, *A. Vésale. Résumé de ses livres sur la Fabrique du corps humain (Andreas Vesalius. A Summary of the Fabrica Books*), Paris, Les Belles Lettres, 2008, pp. XLIX-LV.

3 Most of the authors first describe the inferior cavity [abdomen], then the medium cavity [thorax], along with the various functions of the organs situated in each one of these cavities, which are separated by the diaphragm. They go on with the superior cavity: head and brain, finishing with the limbs, cf. ibid. pp. XLIX-L.

4 *Ibid*., p. LII.

5 Vesalius probably read Galen's text in the edition of the *De usu partium corporis humani* published by Simon Colines in Paris in 1528.

ben in 1555, a collection of Hippocratic treatises that we owe to Cornarius. Besides, Vesalius indicated that he had taken part in publishing Galen's complete works, editing the treatise *De venarum arteriarumque dissectione*[6] – but he bemoaned the loss of the final books of *De anatomicis administrationibus*, which he could not consult[7]. He read the handbooks written by Guinter of Andernach in Paris[8], most probably the five books constituting the *De corporis humani fabrica* by Théophilus Protospatharius in Crasso's translation[9], and the *Onomasticon* in ten volumes by Julius Pollux of Naucratis (134-192), dedicated to Emperor Commodus and translated into Latin by Giorgeo Valla under the title *De humani corporis partibus,* reprinted several times in the 16th century[10].

The references to Galen's treatises are not equally distributed across Book I, and most of them appear in the margins, either separately or in clusters, giving Vesalius the opportunity of a critical intertextual comparison. A special case is that of the treatise on *Bones* by Galen, whose Greek manuscript, according to Vesalius, was kept in the hands of Italian collectors and scholars who prevented him from consulting it, forcing him to read the text in the Latin translation published a few years earlier by Ferdinando Balamio[11]. Vesalius followed the order and presentation of this book quite consistently, adopting even the titles of the chapters. He nonetheless rearranged and classified the anatomical facts he described (for instance devoting a whole chapter to cranial sutures in the *Fabrica*), all the better to discuss them[12].

Added to that is the influence of Celsus. While there is no ancient Latin term – only substitutes – equivalent to the Greek *skeleton,* the *De Medicina* by Aulus Cornelius Celsus (25 BC.- 50 AD), published as early as 1478 and reprinted several times in the 16th century, especially by Giunti in 1524 and Aldi in 1528, had a major influence on the Latin nomenclature of bones. The legend indexed G on the fourth plate of the *Tabulæ anatomicæ sex* refers to both Celsus and Cæsarius, a German humanist who had produced a critical edition of Celsus in Haguenau in 1528, with an introduction by Melanchthon, along with notes and an Index[13]. In Book I of the *Fabrica*, the Latin encyclopaedist rarely appears in the margin of the text, but he is present in the text itself, and used as a model to name the anatomical structures: "The Greeks name *karpos*

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6 *Fabrica* I, p. 55.

7 *Fabrica* II, p. 253

8 Guinter of Andernach, Claudii Galeni Pergameni Introductio seu Medicus. De sectis ad Medicinæ candidatos opusculum, Guinterio Ioanne Andernaco interprete, Parisiis, apud Simonem Colinæum, 1528; Institutionum Anatomicarum secundum Galeni sententiam ad candidatos Medicinæ Libri quatuor, per Ioannem Guinterium Andernacum medicum, ab Andrea VVesalio Bruxellensi, auctiores & emendatiores redditi, Venetiis, in officina D. Bernardini, 1538. See A. DRIZENKO, "Les Institutions anatomiques de Jean Guinter d'Andernach (1487-1574) et André Vésale (1514-1564)" (Jean Guinter d'Andernach's and Vesalius' Anatomical Institutions), Histoire des sciences médicales, 2011, XLV, pp. 321-328.

9 *Theophili Protospatharii, De corporis humani fabrica libri quinque a Iunio Paulo Crasso Patavino in Latinam orationem conversi. Hippocratis praeterea Coi De purgatoriis medicamentis libellus perutilis, ac desideratus, ab eodem Iun. Paulo Cras. Latinitate donatus,* Venetiis, [Ottaviano Scoto il giovane], 1536. Crasso's translation is present in many miscellanies and anthologies; see also Guinter of Andernach's second edition of *Anatomicarum institutionum ex Galeni sententia libri IV*, 1539.

10 *Julii Pollucis Onomasticon, hoc est Instructissimum rerum et synonymorum dictionarium, nunc primum latinitate donatum, Rodolpho Gualthero Tigurino interprete. Unà cum indice*, Basileæ, R. Winter, 1541.

11 *Fabrica* I, chapter 9, refers precisely to the edition of Balamius, *Galeni De ossibus*, Romæ, in ædibus Antonii Bladi, 1535 [43 pages] and *De ossibus ad tyrones, Ferdinando Balamio interprete,* Parisiis, ex officina Christiani Wecheli sub scute Basiliensi, 1535 [46 pages]. See J. VONS, "André Vésale et le traité *De ossibus* de Galien traduit par F. Balamius" (Andreas Vesalius and Galen's treatise *De ossibus* translated by F. Balamius), in V. BOUDON-MILLOT and G. COBOLET, *Lire les médecins grecs à la Renaissance (Reading the Greek Physicians in the Renaissance)*, Paris, De Boccard, 2004, pp. 271-282, and analytical edition of *De Ossibus* by I. GAROFALO and A. DEBRU, Paris, Les Belles Lettres, 2005.

12 See precise notes in the text.

13 Vesalius, *Tabulæ anatomicæ sex,* Venetiis, B. Vitalis Venetus sumptibus Ioannis Stephani Calcarensis, prostrant [sic] uero in officina D. Bernardi, 1538.

the further end of the limb that is articulated with the forearm; following Celsus' example, we shall label it *brachiale*"[14]. One may thus note, among other examples, the following denominations, the first occurrence of which features in the eighth book of *De Medicina : cartilago* (8, 1), *bracchium* (8, 1, 19), *radius* (8, 1, 19, 20), *patella* (8, 1, 25 ; 8, 21, 1), *femur* (8, 1, 25), *tibia* (8, 1, 26), *talus* (8, 1, 27). But Vesalius does not follow the Latin author when describing the *fibula*, which Celsus referred to as the *sura* (8, 1, 16), and he distinguishes the *cubitus* (the forearm) from the name of the bone, *ulna*, borrowed from Pliny (*N. H.* 16, 133 ; 36, 87), while Celsus had one and the same term for the part and the bone (8, 1, 2)[15].

[14] *Fabrica* I, p. 117.

[15] J. ANDRÉ, *Le vocabulaire latin de l'anatomie (The Latin Vocabulary of Anatomy),* Paris, Les Belles Lettres, 1991, *passim*.

Describing the skeleton

The 16th century anatomist found himself in a difficult situation, as there was no precise terminology for certain parts of the body (*e.g.* Vesalius does not name the carpal bones but gives them a number according to the place they occupy in relation to the axis of the body, in a palmar, then in a dorsal position), but a plethora of terms for other structures, in Latin as well as in the vernacular, without any certainty of their being synonymous. The need for a common nomenclature among scholars of various countries was beginning to be felt. In his study of pre-Vesalian anatomical vocabulary, P. Huard states that this need appeared concomitantly with the discovery of ancient Greek and Latin authors, without the intermediary of Arab interpreters[16]. However, research on Arabic medicine and on the way knowledge was disseminated by Jewish or Marrano scholars forces us to qualify and update this opinion. A number of terms inherited from Medieval Latin are presented as translations of ancient Greek terms; others belong to the medical jargon specific to certain academies, regions or professions. Vesalius' criticisms against these poor translators recur across Book I, giving rise to some most polemical passages. In this respect, Vesalius acts as a philologist, as other humanists do, but does so as a specialist, who is particularly competent in the field. He occasionally and cautiously quotes from the *Onomasticon* by Pollux of Naucratis, but he does not use the Greek names *atlas, axis, trochanter, etc.*, used by other authors in his time or before him, such learned physicians as A. Benedetti who in his dedicatory epistle to the *Anatomice* to Maximilian 1st boasts of going back to the Greek and Latin terms from Pollux's *Onomasticon* instead of using the vernacular[17]. Other glossaries appeared in the period, such as that published in 1533 by Johan Schott in Strasburg, or by Otto Brunfels[18], as well as a chart of correspondences between Greek, Latin and Hebrew anatomical terms published in 1519 by Lorenz Fries[19], elaborated form the translation and edition work done by Azriel ben Joseph, an Italian Jew, on Ibn Sina' *Canon*.

The *Tabulæ anatomicæ sex* by Andreas Vesalius were already part and parcel of this broad movement, although the collection of multilingual denominations had been made with a view to accumulating knowledge rather than analytically confronting the terms. Vesalius wrote in Latin, the academic language, aiming at a learned audience, and at disseminating knowledge without popularizing it – unlike Ambroise Paré, for instance, who wrote in French, or Charles Estienne, who translated his own treatise from Latin into the vernacular[20]. When providing Greek terms, he separates them clearly from the Latin ones; more often, the etymology of the Greek term is used as an explanatory device allowing either to translate the term into Latin and

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16 P. HUARD and M. J. IMBAULT-HUART, *André Vésale : iconographie anatomique (Fabrica, Epitome, Tabulae sex) (Andreas Vesalius' anatomical iconography -Fabrica, Epitome, Tabulae sex),* Paris, 1980, pp. 25-26.

17 L. R. LIND, *Studies in pre-Vesalian anatomy: biography, translations, documents,* Philadelphia, 1975, p. 81.

18 *Othonis Brunfels Onomastikon medicinæ,* Argentorati, I. Schott, 1533.

19 L. Fries, *Synonima und gerecht Usslegu[n]g der Wörter so man dan in der Artzny / allen Krütern / Wurtzlen / Blůme[n] / Some[n] / Gesteine[n] / Saffte[n] un[nd] andere[n] Dinge[n] zů schreibe[n] ist in lati[n]scher / hebraischer / arabischer / kriechischer und mancherlei tütscher Zunge[n] biszher nit beieinander gesehe[n] un[d] vil Irtu[n]g un[nd] Missbruch darin gehalte[n] hie mit Fleiss un[nd] Arbeit zesame[n] bracht,* [Strasburg, I. Grieninger], 1519.

20 Ch. Estienne, *De dissectione partium corporis humani libri tres, a Carolo Stephano, doctore medico, editi, cum figuris, et incisionum declarationibus a Stephano Riuero Chirurgo compositis, Parisiis, apud Simonem Colinæum, 1545; La dissection des parties du corps divisée en trois livres (The dissection of the part of the body divided into three books),* Paris, S. de Colines, 1546.

keep the image, or to shed light on the original metaphor that gave rise to the Greek name[21]. Thus, the lambdoid suture is always referred to by the circumlocution "the suture that looks like the Greek letter Λ", the image of which was as obvious for witnesses of dissections of the cranium as it was for learned readers. Let us provide a few examples of this transfer of metaphors from the Greek to the Latin to name the bones. Those that Galen calls *lithoides* are called *ossa petrosa* (petrous bones, from the Latin for "stone") by Vesalius; the stylus-shaped process (*styliformus*) is the equivalent of the Greek term *graphoid,* the breast-shaped one (*mammillaris*) that of the Greek *mastoid; jugula* in Latin refers to the clavicles, which the Greek call *zygômata* (yoke-shaped), but also to a part of the zygomatic arch; *scapulæ* is favored over the Greek *ômoplatai, tibia* over *knèmè, fibula* over *péronè, etc.*

The Latin terminology used by Vesalius also aims at simplicity, at the risk of appearing reductive when compared to the diversity of the Greek terminology. This apparent linguistic impoverishment is legitimized by the author when he presents his method in the first chapters of the *Fabrica;* thus, a bone is composed of a body, a concave or convex head (*caput*), and one or several processes or appendices (*processus*), a division that finds its justification in the shapes that speak to the eye or to the hand and give rise to a consensual theoretical definition based on the senses of sight and touch, available to all.

Arabic terms are fewer; Rhazes and Ibn Sina are mentioned because they take part in the general academic culture, but they are barely used. For example, the terms that refer to the meninges, dura mater and pia mater, are replaced with *membrana dura* and *tenuis membrana,* which later anatomists did not use. While the Preface to Charles V repeats a *topos* of humanistic medicine, denouncing Arabic medicine, the "barbaric obscurity" of its language, and the dangerous lack of efficacy of its remedies, in the same terms as in the *Paraphrasis* in 1537[22], the text itself proves more moderate and reveals not as rigid an attitude as that of several Italian physicians and scholars towards Arabic medicine[23]. There nevertheless seems to have been a transliteration of several Arabic names into Hebraic letters in the legends of the complete plates of the skeleton (cf. *infra*).

Contrary to the other books of the *Fabrica,* in which the anatomical plates are featured at the beginning of the book and are used to support the explanations provided in the body of the text, the three plates of the whole skeleton have been placed at the end of Book I. They present anterior, lateral and posterior views, respectively, and are accompanied with a nominal index of all the bones in the body in varying registers of Latin, Greek and Hebrew[24]. This presentation does not result from a mistake the publisher might have made, as Vesalius himself gives a justification for it. The three skeletons stem from the composition the anatomist made after he dissected the bodies and prepared the bones, as testify the models elaborated and exhibited by Ve-

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21 F. Skoda, *Médecine ancienne et métaphore. Le vocabulaire de l'anatomie et de la pathologie en grec ancien (Ancient Medicine and Metaphor. The Vocabulary of Anatomy and Pathology in Ancient Greek)*, Paris, Peeters, 1988.

22 A. Vesalius, *Paraphrasis in nonum librum Rhazae medici Arabis clariss. ad regem Almansorem, de singularum corporis partium affectuum curatione*, Lovanii, ex officina Rutgeri Rescii, 1537.

23 P. E. Pormann, "La querelle des médecins arabistes et hellénistes et l'héritage oublié" (The Quarrel of the Arabist and Hellenist Physicians, or the Forgotten Heritage), in *Lire les médecins grecs à la Renaissance (Reading the Greek Physicians in the Renaissance)*, ed. V. Boudon-Millot and G. Cobolet, Paris, De Boccard, 2004, pp. 112-141; J. Vons, "Formes académiques et méthode scientifique dans la *Fabrica* d'André Vésale" (Academic forms and scientific method in Vesalius' *Fabrica*), *Le XVIe siècle*, 2012, 8, pp. 75-86.

24 Both the skeleton viewed laterally and the index are featured in the *Epitome*, constituting an additional proof of the close link between the two books.

salius in the course of demonstrations in Bologna in January 1542[25], or the presentation of the skeleton of Karrer Jacob von Gebweiler, dissected in May 1543 in Basel, at the time when the *Fabrica* was being printed[26]. The legends to the three skeletons comprise names in Hebraic letters along with their transliteration into Latin. There are numerous mistakes in these legends: alterations in the transliteration, eye-skip errors in the Latin terminology, frequent confusions between Arabic and Hebrew names. In order to make reading easier, and as the metaphors are frequently identical from one language to the other, we chose to give the various terms in the different languages with their translation between brackets, specifying the language in which the name is expressed in the original text – except for the first ones in the list, which are always in Latin.

In addition to these purely linguistic difficulties are those linked with conceptions of the body that are different from ours; thus, we frequently refer to both the bone and the part of the body where it stands by one and the same name, *tibia,* whereas Vesalius usually uses the periphrasis *tibiæ os,* on the model of *pectoris os* for the sternum. Some thirty years ago, this terminology was considered by certain physicians as "vague, ambiguous and obsolete"[27] because of the French tradition of university anatomy teaching, favoring the use of the lexicon based on the Greek nomenclature, *epiphysis* thus prevailing over *processus*, next to terms such as kneecap or shoulder blade, used in ordinary, non specialized language. Today the nomenclature Vesalius created has become what he could have hoped for, *i.e.* an international nomenclature based on a common Latin background, which developed according to the characteristics of the specific vernacular languages[28].

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25 R. ERIKSSON, *Andreas Vesalius' First Public Anatomy at Bologna, 1540, an eyewitness report by Baldasar Heseler, medicinæ scolaris, together with his notes on Matthaeus Curtius' lectures on Anatomia Mundini*. Uppsala & Stockholm 1959, p. 88.

26 C. D. O' MALLEY, *Andreas Vesalius of Brussels,* Berkeley and Los Angeles, 1964, pp 137-138 (letter written by Vesalius to Johannes Gast, deacon of St. Martin's in Basel). The surgeon who assisted Vesalius was Franz Jeckelmann, the future father-in law of Félix Platter, physician in Basel.

27 P. HUARD and M. J. IMBAULT-HUART, *André Vésale : iconographie anatomique (Fabrica, Epitome, Tabulae sex) (Andreas Vesalius' anatomical iconography-Fabrica, Epitome, Tabulae sex),* Paris, 1980, p. 30.

28 *Infra*. Notes on the translation.

Teaching the skeleton

By repeatedly showing his defiance towards those who merely know the *language* of anatomy, Vesalius sheds light on his superiority and his competence as an anatomist, aiming at understanding, showing and explaining what the skeleton is. Numerous parts in Book I of the *Fabrica* are very clearly a reflection of the lectures given by Vesalius, devoid of any reference to ancient sources, but based mainly on the description of the upper and lower limbs. One can observe that the writing is different, lighter, with clearer marks of orality, as if the master were addressing an audience he wishes to convince of the necessity of anatomy, neither forgetting the pleasure given to those discovering the beauty of the body's structures, nor hiding the doubts assailing him. Indeed, Vesalius was not addressing one single apprentice, as Galen had done, or one young surgeon in particular, as Ambroise Paré was to do later, but an audience comprising students in medicine, surgeons and scholars[29], whom he sometimes questioned or challenged (p. 54), and constantly invited to listen, examine and touch. Indeed, the descriptive writing is quite elaborate due to the complex use of subordinations, the variety in phrasing, the surprising contrast between the recurring precision of the same anatomical term (*sinus* for example) – leading us sometimes to divert from the current nomenclature (depression, cavity, pit) – and the extreme lexical variety in non-specialized fields[30]. One also notices an obvious liking for double negations as well as for rhetorical questions, but Vesalius nonetheless uses a much more familiar language register when he describes small manipulations (inserting a hair into a foramen, measuring the length of a vertebral process, *etc.*) or when he invites his audience to compare a human structure he described with that of an animal put on the dinner table or else when he makes his audience participate in a demonstration, using their hands as measuring instruments for their own bodies (chapter 25). The desire to teach (*docere*) can also be noticed in the structure of discourse, through the recurring presence of formulas summarizing the argumentation, the use of adverbs (*itaque*, *deinde*) highlighting the logical progression of the reasoning, down to the conclusion, generally presented under a deductive form meant to convince the audience or the reader[31].

Here may well lie the unity of Book I, as of the following books, the unity between words, gestures, and images. As Pliny the Elder had done for the description of the world, Vesalius describes the body through images. The first chapter of Book I is an inventory of the various shapes of the bones, a walk through the body, devoid of hierarchy or order, from the feet to the head to the flanks, at the end of which we are convinced that our skeleton is indeed the microcosm of all the possible forms in the universe. The analogical discourse is a pedagogical way to memorize the bones from their shapes, as opposed to learning a nomenclature by rote, but it is also the result of a thinking process that establishes constant links between the body and the outer world. Be it in comparisons with daily-life objects and occupations – a beak-spouted ewer, a bulging pot, a spindle, a children's game with fish scales – or in more elaborate analo-

[29] Vesalius' contemporaries knew the meaning of the second-person singular in Latin, and the "tu" featured in books written in French, when it was not used to address one particular reader, was indeed the equivalent of our indeterminate "on." Another formula used by Vesalius to refer to a hypothetical opponent without naming him: *aliquis*.

[30] Read for instance the description of the illustrations in chapter XXV.

[31] There are numerous examples of these devices mentioned in the notes on the translation.

gies related to the fields of mathematics or architecture, the images used to describe the bones bring out this *Opifex* anatomist, who knows why he uses such or such an image, and who knows its finality. It is therefore a position of superiority that is conferred to the Master through the invention of a writing featuring characteristics that usually belong to orality. Vesalius entices the readers to a promise of later discoveries, he guides them in their learning process, recalls what has already been said and is supposed to be known. He makes the text come alive, just as he shows the body in his lessons, through the recurring use of deictics and of verbs inviting one to look, see, and observe. At the same time however, he declares that mere knowledge of bones is not enough, that it will have to be complemented by that of muscles and nerves, as well as by the understanding of movement – in other words, it will be necessary to follow him through the seven books of the *Fabrica*, the composition of which he conceived and methodically ordained.

What might be considered as verbose, useless, excessively long, or even anecdotal, when compared to the rigor that is expected today from those who transmit knowledge, is not so from the point of view of the writer, who thus announces a coherent and elaborate editorial project encompassing all seven books. The mounting of the skeleton after its description bone by bone consists in elaborating a new object, which will in its turn become the subject of further study, and may be considered as a metonymy for the whole work. If God, or Nature, is *Opifex rerum,* the supreme artisan of the world and of men, Vesalius appears as an *Opifex* of the human body, staging it, giving it particular poses, shedding light on certain anatomical characteristics, which had an obvious symbolical interpretation for the entire Western civilization. Vesalius' leaning skeleton for example was to nourish the literature on melancholy.

It is pleasure and joy (*iucunde*) however that arise when the anatomist beholds the meticulous, perfected (*eleganter*) adjustment of some small bony pieces, a pleasure he tries to impart to the reader. Indeed, on this adjustment depends the balance of the body, its stability, which justifies the place devoted to the description of the bones in the work, although we are sometimes frustrated not being able yet to "see" what vein, what artery, what nerve are indicated in such or such foramen. We frequently have to imagine, as Vesalius advises us to do, to form a mental representation of a piece he describes as he has it under his eyes or in his hand. He turns this piece over and over again, multiplying the spatial indications (behind, beneath, outside), which only make sense when confronted to reality or to the drawing that represents the structure in question under different aspects (anterior or dorsal views). Numerous passages nonetheless invite the reader not to let himself be exclusively guided by the gestures and the words of the master, but to personally examine the structures that are being described (p. 67), following the advice Galen himself had given to his disciples. Those who are responsible for the discredit of anatomy are precisely those who, having no anatomical knowledge, contented themselves with copying texts without trying to see and understand what they described; on the contrary, the method Vesalius recommends allows him to assert himself as the true inheritor of Galen (p. 81), and to go further than Galen had gone.

A few specific points

One of the difficulties Vesalius was confronted with in Book I was, as we previously said, the necessity to show osteology, and at the same time to introduce the other constituents of the body, to be presented later in further detail. Referring to illustrations featured in other Books is a way to make the reader go further into the *Fabrica,* but can also be a source of frustration, as he cannot identify what has not been described yet, according to the method defined by Vesalius in the first chapter of Book I. For the contemporary reader, this also amounts to tempting him to try and identify everything, and, thereby, to include the whole *Fabrica* in the first Book. But this way of teaching anatomy, which Vesalius chose to adopt, namely step by step, still prevails today: skeleton, muscles, nerves, vessels, *etc.*

At any rate, nothing was fixed yet in anatomical knowledge (and that is still the case today); thus, as the book unfolds, several specific points, subject to commentaries or controversies, come up. If they do not constitute the main material of the treatise, some nonetheless echo on going discussions of Vesalius' time, of which we have other testimonies. It is for example the case for the reticular plexus, for the shapes of the heads or for the sutures of the cranial bones (of which we present here a mere provisional and partial approach, until development and complements are provided in Books III and VII), and for the foramina of the cranium.

The reticular plexus

The example of the reticular plexus shows how important *de visu* observation is in the evolution of Vesalius' conception over a few years. The 1538 *Tabulæ anatomicæ sex* are still very close to Galenic physiology as presented in the *De usu partium* IX, 4, and on the third plate, in index B, they present this structure supposed to transform the vital spirit into an animal spirit. In the *Epitome,* the non-existence of this structure in man is clearly stated in the fifth chapter, as well as under indices ς and τ of figures [Na] and [Oa] (*rami soporalis qui plexum reticularem efformare perperam creduntur*, "the branches of the carotid, wrongly supposed to form the reticular plexus")[32]. On the contrary, the allusions to *rete mirabile* are scattered all through the 1543 *Fabrica*, presented with humor, distancing and irony (not always seen or understood by commentators), but they find their legitimacy only in the description of the vessels and of the brain, as we shall see later. Finally, Vesalius does not resign himself to adopting all the Galenic dogma, but his critical mind prevails, and he boldly clears the path of what will become modern anatomy[33].

Crane shapes and cranial sutures (chapter 5)

This very long chapter comprises a morphological description and a physiological presentation of several structures. The figures of five crania illustrate a development on the place of the eyes, sensory organs that are essential due to their proximity with the brain, here again repeating and correcting Galen's opinions (*De usu partium* VIII, 5-6). Vesalius' commentary corrects what

[32] A. Vesalius, *Epitome*, ed. J. Vons and S. Velut, *Résumé (Summary),* Paris, 2008, p. 94 and 134, note 195 and pp. 224-225.

[33] B. Bataille, M. Wager, F. Lapierre, J. M. Goujon, K. Buffenoir, P. Rigoard, "The significance of the *rete mirabile* in Vesaliu's work: an example of the dangers of inductive inference in medicine," *Neurosurgery,* 2007, Apr. 60 (4), 761-8 (discussion p. 768).

might be too "realistic" an interpretation of the representations of such crania, confronting texts by Hippocrates (*On injuries of the head)* and Galen to real-life cases of hydrocephalus observed *de visu*. Vesalius himself came back to this passage in the 1555 edition (pages 23-24), confirming that he had examined a young woman from Augsburg presenting signs of hydrocephalus before and after her death: her head had swollen over seven months, but she had kept all her senses; autopsy revealed the presence of water in the ventricles, but not in the other parts of the encephalon. He mentions a future treatise of pathological anatomy on the topic, which he never actually did write.

The various cranium shapes induce a development on the number of bones and interbone sutures. Whereas their number was unsure for Hippocrates (*On injuries of the head 1*) and for Celsus (*De Medicina* 8, 1), and while physicians and surgeons of the Renaissance had divided opinions on the number and shape of cranial sutures, generally resorting to a list of authorities to back up their assertions[34], the descriptions of cranial sutures are here remarkably precise and detailed. But Vesalius follows Galen (*De usu partium* IX, 1) in his explanation of the use of cranial sutures, given across Book I (chapters 5, 10), and which we shall develop in the study of Book VII.

The cranial foramina (chapter 12)

This is the most complex chapter of Book I of the *Fabrica*, not featured in the *Epitome*, and probably the first one to present a synthetic view of specific structures, namely the foramina. But at the same time it sheds light on the limits of such a division of the body, which must have required dozens of different observations. It is relatively easy for an anatomist to locate the foramina on the representations of the exocranial and endocranial surfaces of a "dry cranium," and to name them once they have been identified, but merely identifying them falls short of the complexity of the description given by Vesalius in each index. This description, which is one of the first attempts to dissect the cranial bones in particular, shows its limits. These limits stem from the lack of adequate techniques and tools to achieve a perfect conception of the anatomy of the basis of the cranium (neither milling nor softening techniques were available, for example). But he was also confronted to the problem of completeness, so numerous are the variations of this bony structure, so complex the morphology of its cavities (petrous bones in particular) and the relationships between these bones. When, in addition, he is confronted with the problem of the elements (vessels, or nerves) that go through this basis, Vesalius has to multiply the references to later books in the marginalia, and also to extrapolate from an observation made on a dry cranium, adding explanatory drawings when the figure proves insufficient. Indeed, as he cannot observe at once the "hard" (bone) and the "soft" material (the vessels or the nerves over their whole trajectories), he has to "go back and forth." Let us add that the presence of the dura mater, through which these vascular and nervous elements also circulate, makes the relationships between the bones and the noble structures even more complex. Thus, the hiatus

[34] See Sylvius' extensive commentary *Iacobi Sylvii Medicae Rei apud Parrhisios interpretis regii Commentarius in Claudij Galeni de Ossibus ad Tyrones libellum, erroribus quamplurimis tam Graecis quàm Latinis ab eodem purgatum*, Parisiis, apud Petrum Rouart, pp. 131-134. The disagreement between anatomists – contemporary to Vesalius or preceding him (Achillini, Benedetti and Massa) on the number of cranial bones had no influence on the Galenic theories on the function of sutures, cf. L. R. LIND, *Studies in pre-Vesalian anatomy: biography, translations, documents,* Philadelphia, 1975, p. 57, 114, 233; C.D. O' MALLEY, *Andreas Vesalius of Brussels,* Berkeley and Los Angeles, 1964, p. 251, 253 and 277.

between a thorough morphological description, accompanied with anatomical intuitions (*e.g.* the various membranes) that will not be found again until Bartholin, on the one hand, and very confused explanations on the passage of vessels and nerves on the other, is quite surprising for the contemporary anatomist. And yet, Vesalius' pedagogical approach remains the same, and is based on observation so that any medical student may "observe" the holes and the canals in the cranial bones, and draw conclusions on their general function as "pathways" for vessels (veins, arteries and nerves), the path (and the name) of which he will progressively learn in the books that are devoted to each one. There are, as a consequence, numerous *in situ* notes for this chapter.

Vesalius and Galen

It seems difficult here not to broach Vesalius' notorious opposition to Galen, to which Vesalius' pioneering theories have long been reduced. It is probably one of the surprises of Book I of the *Fabrica* to nuance that opposition and to offer a new argumentation concerning the relationship of Vesalius to Galen. Indeed, Vesalius says that he is indebted to the "prince of anatomists" (p. 68) and that he respects him, even though he is second to the divine Hippocrates. He was reproached with paraphrasing him; this is true, and frequently a chapter or a series of chapters (the head, the spinal cord) starts with a paraphrase of one or several texts from Galen. But the genre of the *paraphrasis* was considered as a teaching mode both in the Middle Ages and at the Renaissance: the point was to present the theories of an author before discussing them[35]. The fifth chapter of the *Fabrica* is built on that model: Vesalius summarizes the content of several chapters from Book VIII of *De usu partium,* in which Galen finely analyzes the sensory organs, especially those of vision, linked with the brain, distinguishing between soft nerves and hard nerves; Vesalius keeps the logical sequence of this long demonstration, further details the anatomical description (eyelids, eyelashes, frontal bone) and insists on the role of the nerves.
Galen's books nonetheless feature inconsistencies or contradictions, to which the Renaissance anatomist is confronted. The first type of explanation is textual: comparing Galen's books, Vesalius observes that Galen's theories have evolved over time, but that he did not correct his early writings. The second type of clarification is more subtle: Galen's descriptions are generally in keeping with the anatomy of several animal species[36], and it was Galen's successors who wrongly attributed them to man. This mistake is due to the fact that Galen's texts were misunderstood, partly because of the ignorance of his successors, and partly because the texts are obscure and difficult to understand: through successive steps, and in a clever twist, dissection is thus presented as the best way to investigate and to understand the texts, and no longer as their mere illustration (p. 78). The most strident criticisms are directed against Galen's successors and translators who did not strive to grasp the meaning of the texts, but merely glossed them. Vesalius' indignation, his exasperation even, seems to be sincere.

35 M. Biesbrouck, Introduction to *Paraphrasis* (online).
36 A wide range of animals is featured: in addition to bovines and ovines, one notices monkeys, dogs, cats, squirrels and dormice.

Persons mentioned in Book I

This is one of the – possibly secondary, but nonetheless real – appealing features of the treatise : the presence of assistants, friends, physicians and other people, who constituted a geographical microcosm, and possibly a linguistic one, gathering together people who were interested in the same research topics as Vesalius. Some of them are linked with his professional life in Padua, others belong to the world of humanists and scholars from Northern countries, others still appear in the *Fabrica* for no other reason than the friendship linking them with its author. Our aim is not to produce a biography of each person mentioned in Book I, which, incidentally, we would not be capable of, but to understand, through some examples, how networks of scholarly relationships were established across Europe during the first half of the Renaissance[37].

Lazarus of Frigeis (page 166)

Information on one of the very close friends of Vesalius, and possibly a collaborator of his in the preparation of the *Fabrica*, has long been extremely scarce, and is still quite fragmentary. Lazarus of Frigeis seems to have been part of this large intellectual family of conductors of Arabic knowledge, written and divulged in Hebrew. He is mentioned as an interpreter and a commentator of Avicenna in the introduction to the legends of the three skeleton figures, but we do not know for sure the exact role he played in Padua's *Studium*, one of the few universities open to Jews. Although he does appear on the frontispiece, was he an assistant to Vesalius in the lessons intended for surgeons, given from 1537 to 1544, as is suggested by S. Franco[38] ? We know for sure that he was one of the two sons of Raffaele and Elena Fritschke, who had come from Austria or Bohemia and had settled in the Jewish community of Padua at the end of the 15th century or at the beginning of the 16th century. His father, who probably had a medical profession, died in Venice around 1540. Lazzaro apparently left Padua in 1547 and settled with his mother in the old Venice ghetto. He converted to Catholicism in 1549, under the name Giovanni Battista Freschi Olivi. He is said to be responsible for the blacklisting of the Talmud, burnt on the Piazza San Marco in Venice on October 21, 1553, by order of the Council of Ten. In March 1555, his mother, accused of impiety, was pronounced *amens* by her sons, and was thus saved from the stake[39]. The name of Lazarus of Frigeis still appears in the 1555 edition of the *Fabrica*, but devoid of the mention *insignis medicus,* which is probably due to his new responsibilities as a doctor in theology[40].

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37 Other persons are mentioned in the Preface of the *Fabrica*.

38 S. Franco, "Ricerche su Lazzaro ebreo de Frigeis, medico insigne ed amico di Andre Vesal," *La Rassegna Mensile di Israel 15*, 1949, pp. 495–515.

39 P. C. Ioly Zorattini, *Processi Del S. Uffizio Di Venezia Contro Ebrei E Giudaizzanti, 1548-1560. Vol.I,* Florence, 1980, pp. 51-52 and 151-224 (transcription of the process of Elena Freschi); B. Pullan, *The Jews of Europe and the Inquisition of Venice: 1550-1620*, London, 1988, pp. 282-285.

40 The bibliography is lengthy but tends to repeat itself, *e.g.* J. Pines, "Le Juif Lazare de Frigeis, collaborateur et ami intime d'André Vésale," *Le Scalpel*, *117*, 1964, pp. 5-12; B. Bugyi, "Rilievi critici sul medico traduttore di Vesalio, Lazarus de Frigeis", *Acta Medicæ Historiæ Patavinæ, 11,* 1964-1965, pp. 203-205; Id., "Critical Notes about Lazarus de Frigeis: Vesalius's Advisor in Hebrew Terminology," *Koroth, 3,* 1966, pp. 613-615; F. Piovan, "Nuovo documenti sul medico ebreo Lazzaro 'De Frigeis' collaboratore di Andrea Vesalio," *Quaderni per la Storia Dell' Universita di Padova, 21,* 1988, pp. 67-74; D. Carpi, "Alcune nuove considerazione su Lazzaro di Raphael 'de Frigiis'", *Quaderni per la Storia Dell'Universita di Padova, 30*, 1997, pp. 218-226.

Christophe Pfluegel (page 19)

According to O' Malley[41], the mention of Christophe Pfluegel and of the siege of Louvain in July 1542 was probably a last-minute addition, and an interpolation in the consecutive writing of the *Fabrica,* since, as indicated in the Preface, the manuscript had already been completed at that date. The historian sees in it an additional proof that the manuscript was not sent to the printer before the end of August 1542.

The siege of Louvain took place during the war led by Martin van Rossem, Duke of Gelderland, supported by the French, who claimed Dutch territories in Charles V's empire that were placed under the protection of the Emperor's sister. Rossem's armies walked across Brabant towards Antwerp, with a view to joining the Duke of Vendôme in Flanders. Antwerp resisted and Rossem advanced on Louvain. In July 1542, the army was at the walls of Louvain. Many inhabitants fled. Considering the timorous attitude of the Communal Council, the university and the students decided to defend the city. Among them were Gemma Frisius, Christophe Pfluegel (registered in 1536), university representatives, among whom Adrien of Blehen, who, according to Vesalius, had promoted dissection in Louvain[42]. Vesalius met Pfluegel in 1536-1537. Pfluegel's name does not appear in the 1555 edition.

Marcantonio Passeri, called Genoa or Genua (page 35)

Already mentioned in the *Letter on bloodletting*[43], Marcantonio Passeri (1491-1563), born in Padua, was chosen by the *Riformatori* in 1528 to give philosophy lectures in Padua's *Studium*. An Aristotelian philosopher, he is the author of Commentaries on *De anima, De cœlio, De generatione.* He is represented on the frontispiece of the *Fabrica,* but his name is not featured any longer in the 1555 edition[44].

Wolfgang or Wolffgang, Peter Herwart (page 35)

Born in Augsburg in 1514, son of Conrad Herwart and Laura Laengin, he had close relations with the physicians, apothecaries and notables of the city. He became an elected member of the Augsburg Council in 1553, and he married Anna Pfister, the daughter of the burgomaster Marcus Pfister, in 1555. He was appointed Inspector of Apothecaries along with four other physicians (Adolphus Occo, Achillus Gasser, Lucas Stenglin, and Christopher Heyberger), three of whom became friends of Vesalius during and after his stay in Augsburg with the Emperor. He progressively became blind and died in 1585. He is represented on the frontispiece of the *Fabrica*, and is the addressee of some *Consilia* written by Vesalius[45].

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41 C.D. O' Malley, *Andreas Vesalius of Brussels,* Berkeley and Los Angeles, 1964, p. 123.

42 H. de Vocht, *Monumenta humanistica Lovaniensa, Texts and studies about Louvain humanists in the first half of the 16th century,* Louvain, Librairie universitaire, 1934, pp. 626-627. E. Poulet, "Le siège de Louvain de 1542" (The 1542 siege of Louvain), *Journal historique et littéraire*, Brussels, 1868, p. 573-584. The school captain was Damien de Goes, a Portuguese humanist and friend of Erasmus who lived in Louvain.

43 A. Vesalius, *Epistola docens venam axillarem dextri cubiti in dolore laterali secandam : et melancholicum succum ex venæ portæ ramis ad sedem pertinentibus purgari,* Basileæ, in Officina Roberti VVinter, 1539, pp. 64-66.

44 C.D. O' Malley, *Andreas Vesalius of Brussels,* Berkeley and Los Angeles, 1964, pp. 144-435.

45 *Ibid*. p. 37, 264, 435, and L. Houtzager, "A. Vesalius and the Occo Medals of Augsburg," *Vesalius*, 2000, VI, 1, pp. 20-31.

Realdo Colombo (page 56)

Realdo Colombo (*Renaldus Columbus*) from Cremona (1516-1559), son of an apothecary from Cremona, Antonio Colombo, and nephew of Paolo Colombo, to whom Vesalius succeeded, had spent seven years in Venice learning surgery with Giovanni Antonio Lonigo, a surgeon who protected Paolo Colombo. He was lecturer in philosophy at the University of Padua at the same time as John Caius, and then in 1540 he started studying medicine. In October 1541, he was appointed to a second chair of surgery. His interest for anatomy designated him as deputy chair of surgery while Vesalius was absent during the winter 1542-43. Realdo was given tenure in October 1544 in Padua, and was appointed first professor of anatomy at the University of Pisa by Cosimo de Medici. He then went to Rome, where he befriended Michelangelo and also, most probably, the anatomist Juan Valverde de Hamusco, and was given the chair of anatomy at La Sapienza, where he stayed until his death in 1559. Several autopsies of famous people, among whom Ignatius of Loyola, who founded the Society of Jesus in 1556, made him famous. A fine anatomist, very critical of Vesalius, he claims a large number of anatomical and physiological discoveries (the stirrup, the clitoris, some eye muscles, the movements of the heart, digestion) that are recorded in his treatise *De re anatomica libri XV*. In the original dedication to Pope Paul 3rd, the author establishes the orthodoxy of anatomical research in the context of Catholicism and in the fight against heretics. The book largely adopts the order followed by Vesalius in the *Fabrica*, giving priority to the skeleton (97 pages out of 269, and more than 40 pages for the bones of the cranium and the face). It also resorts to the system of annotations in the margins, which form a contents page for the text or provide a list of the names of authorities. The treatise comprises a long development on the formation of the fetus, a book on vivisection and a final book devoted to what is rarely seen in the course of a dissection. The frontispiece of the treatise engraved by Veronese reuses the theme of Vesalius' anatomy lesson: the author dissects a human cadaver in front of his pupils, among whom the famous physician and naturalist Andrea Cesalpino. One of his pupils in Padua was William Harvey.

Giovanni Andrea Bianchi (page 78)

Giovanni Andrea Bianchi (*Ioannes Andreas Albus*), originally from Parma, taught medicine and philosophy at the University of Bologna from 1525 to his death in 1565[46]. Vesalius was his guest during his stay in Bologna in January 1540, and he showed him a comparative dissection of the lumbar vertebrae of an ape and a man.

Gemma Frisius (page 161)

Gemma Régnier, *aka* the Frisian (*Gemma Frisius),* was born in 1508 in Dokkum in Frise. He registered at the *Pedagogium Lilium* of Louvain on March 26, 1526, and became *magister artium* in March 1528. Then he studied medicine, became a bachelor in 1536 and a doctor on August 30, 1541. Along with Christophe Pfluegel, from Salzburg, he took part in the defense of the city of Louvain in July 1542. A mathematician, a cosmographer and an astronomer, he was often consulted by Charles V. He created several astrolabes and measuring instruments with

[46] C.D. O' Malley, *Andreas Vesalius of Brussels,* Berkeley and Los Angeles, 1964, pp. 98, 100 and 434 n. 117.

Gérard Mercator, and published several books on mathematics and astronomy, among which *De principiis astronomiæ et cosmographiæ,* which was re-published several times during the 16th century. After his death in 1555, his son Cornelius Gemma Frisius (1535-1577) succeeded him[47].

Ghisbertus Carbo Lovaniensis (page 162)

Gijsbrecht Colen (*Ghisbertus Carbo),* who was for a long time unknown, was recently identified by Maurits Biesbrouck and Omer Steeno. Born *circa* 1512, he was admitted into the *Pedagogium Castri* in Louvain in 1527 and most probably obtained his medical doctorate in 1534. He then became personal physician to the prince-bishop of Liège[48].

47 A. de Vocht, *Monumenta humanistica Lovaniensa,* Louvain, 1934, pp. 626-627; F. Van Ortroy, *Bio-bibliographie de Gemma Frisius, fondateur de l'Ecole belge de géographie, de son fils Corneille et de ses neveux les Arsenius (Bio-bibliography of Gemma Frisius, founder of the Belgian School of Geography, of his son Corneille and of his nephews, the Arseniuses),* Amsterdam, 1966 [re-edition]; M. Biesbrouck and O. Steeno, "Leuven: Birthplace of Modern Skeletology, thanks to Andreas Vesalius, with the Help of Gemma Frisius, his Friend and Fellow-physician," *Acta Chir. Belg.*, 2012, 112, pp. 89-105.

48 M. Biesbrouck and O. Steeno, "Ghysbrecht Colen, alias Gisbertus Carbo, AndreasVesaliu's friend from Leuven (Louvain)," *Vesalius* 2007, 13 (2), pp. 77-81.

Notes on the edition, the translation and the commentaries to Book I of the Fabrica

For the whole work by Andreas Vesalius, we have adopted the same principles of transcription and translation as those we had set for the *Epitome*. They are briefly recalled here.

The edition of the text

The 1543 copy on which we worked is that which belongs to the *Inter-University* Science *Library* of Paris. We respected the spelling of the Latin text, as well as the writing variants for one given word, attesting to the fact that spelling was not yet standardized (*annularis* et *anularis)* or testifying to the evolution in the pronunciation of Latin (*negocio* et *negotio);* we also kept the double consonants (*asscribuntur*) or their simplifications (*extructa* for *exstructa*), as well as the writing *-ij* (for *ii*). The abbreviations of final syllables (*-am*, *-um*) and the specific signs that indicate a ligature were resolved in the transcription of the text made by Ms Marie-Rolande Cornuéjols, whom we most sincerely thank here for her invaluable help. We also decided to keep the original punctuation, in particular the commas placed before a conjunction (*ut, ne, quod*) introducing a completive subordinate clause, and the full stop followed with a lower-case letter – whereas the translation features a semi-colon or a colon. We did not deem it necessary to reproduce the notes featured in the inner margins, because they did not add anything to the original text, but we did reintroduce the outer marginalia, which constitute a kind of contents table to the chapter or provide references to authorities.

The translation

The French text benefits from a beautiful original layout we owe to Mr. Jacques Gana. We kept the same pagination as those of the digitized copy of the *Fabrica* and its transcription into Latin. The reader may thus easily go from the original to the transcription and/or the translation. We tried not to standardize Vesalius' style, characterized by its diversity and also, frequently, by elaborate stylistic constructions (succession of subordinate clauses, chiasmus constructions, rupture of syntagmatic units), and although we sometimes simplified syntax, we maintained the logical sequence it implied. The marginal notes and the references to illustrations were translated and placed in the margins, as Vesalius had recommended in his letter to Oporinus. The translation of the references to figures proved indispensable, and gives us the opportunity to observe – and admire – Vesalius' very complex system of multiple references, minor mistakes in the numbering of plates or figures, and perfect mastery of correspondences between text and image. The illustrations were not reproduced, but they can be magnified enough in the original to be referred to without any difficulty, and to recognize the legends that accompany them (in fewer numbers than in the *Epitome*) while leaving the image intact. They are referenced by a note corresponding to the word that is as close as possible to that used in the Latin text; there are a few explanations devoid of any note (marked by the sign *). Similarly, the external marginal notes draw attention to the content of the paragraph they refer to. This disposition proves very useful considering the abundance of typographical signs on a single page. It guides the

contemporary reader, who might feel disconcerted by the massive layout of a text in one block, not divided into small, juxtaposed paragraphs.

The iconography

The studies on the iconography of the *Fabrica* being very numerous, we chose to discuss them in the general introduction. The case of large and small ornate capitals at the beginning of a chapter shall be addressed separately and compared with the 1555 edition. From original illustrations in these two editions, situated in their original place, it will be possible to analyze and specify the nature of the relationship between the image and the text (for example the large capital at the beginning of chapter 39, frequently misinterpreted).

Notes and commentaries

As was the case for the *Epitome,* we did not want to pass judgment on the state of Vesalius's anatomical knowledge or to intervene in the text, apart from trying to explain it. Such is the aim of the identifications we (cautiously) suggest. Some equivalences are obvious, but others are merely hypothetical or likely because the structure in question is not sufficiently described, or will be described in later books, or is presented differently today. These identifications are generally placed in the text itself between right square brackets, next to the name used by Vesalius, but they may give rise to a discussion, featured in notes. The example of the cranial foramina showed it: attempting to identify all the nerves, veins and arteries they contain would amount to placing the whole *Fabrica* in Book I, with an increased risk of anachronism as we try to mention what we "know" today about what could go unnoticed in the 16th century.
Our common aim was thus to present a text that would be as close as possible to the original, respecting the book as a patrimonial object, which is precisely and paradoxically possible thanks to the most modern reproduction and layout techniques.

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