

VESALIUS'S CONTRIBUTION TO SCIENCE

In 1542 Andreas Vesalius, being allowed to leave Padua where he was teaching surgery left for Venice in order to prepare the publication of his work *De corporis humani fabrica libri septem* which would make his renown. This work was to come out in June 1543, in folio and counting 700 pages, through the good offices of his Basel editor John Oporinus.

At Venice Vesalius attended mainly to the preparation of the plates which were to adorn his book. The makers of these marvelous drawings remain to us as unknown as those of the wood engravings which were used for their printing. After having dispatched them to Basel Vesalius himself went to this town and stayed there till the printing of the *Fabrica* was finished, as well as a summary of this work called the *Epitome* which was published in Latin and German.

With the *Fabrica* a new era of human anatomy has started. It constitutes the first treatise in which the author proclaims to be guided only by the observation of the human body itself. It does not only constitute a far more extensive written text than all that came before, containing less errors, but it supplies anatomy with a new language and it is of a perfection never reached before as well for the beauty of the numerous plates by which it is illustrated as for the appearance and the printing.

Vesalius who until then had been an adept of the school of Galen for the first time stated the principles of his method during a dissection performed by him at Bologna from the 15th January 1540 onwards. This dissection is conceived and worked out according to the method described in the *Fabrica*: dissection of one or two human corpses in the presence of a reassembled skeleton, drawings and sketches followed by the dissection of an animal as a training in compared anatomy. In 1539 Vesalius who until then had only a restricted number of corpses for dissection at his disposal, began at Padua to obtain a far greater number of human bodies and this thanks to his friendship with judge Contarini who did not only reserve him the corpses of the executed, but also fixed the dates of beheadings in order to supply him with corpses according to a well regulated time-schedule. Vesalius was dissecting with his students who supplied in the occasional lack of material from judicial origin by snatching during the night recently buried corpses which were made unrecognisable by a clever process of total stripping off of the skin.

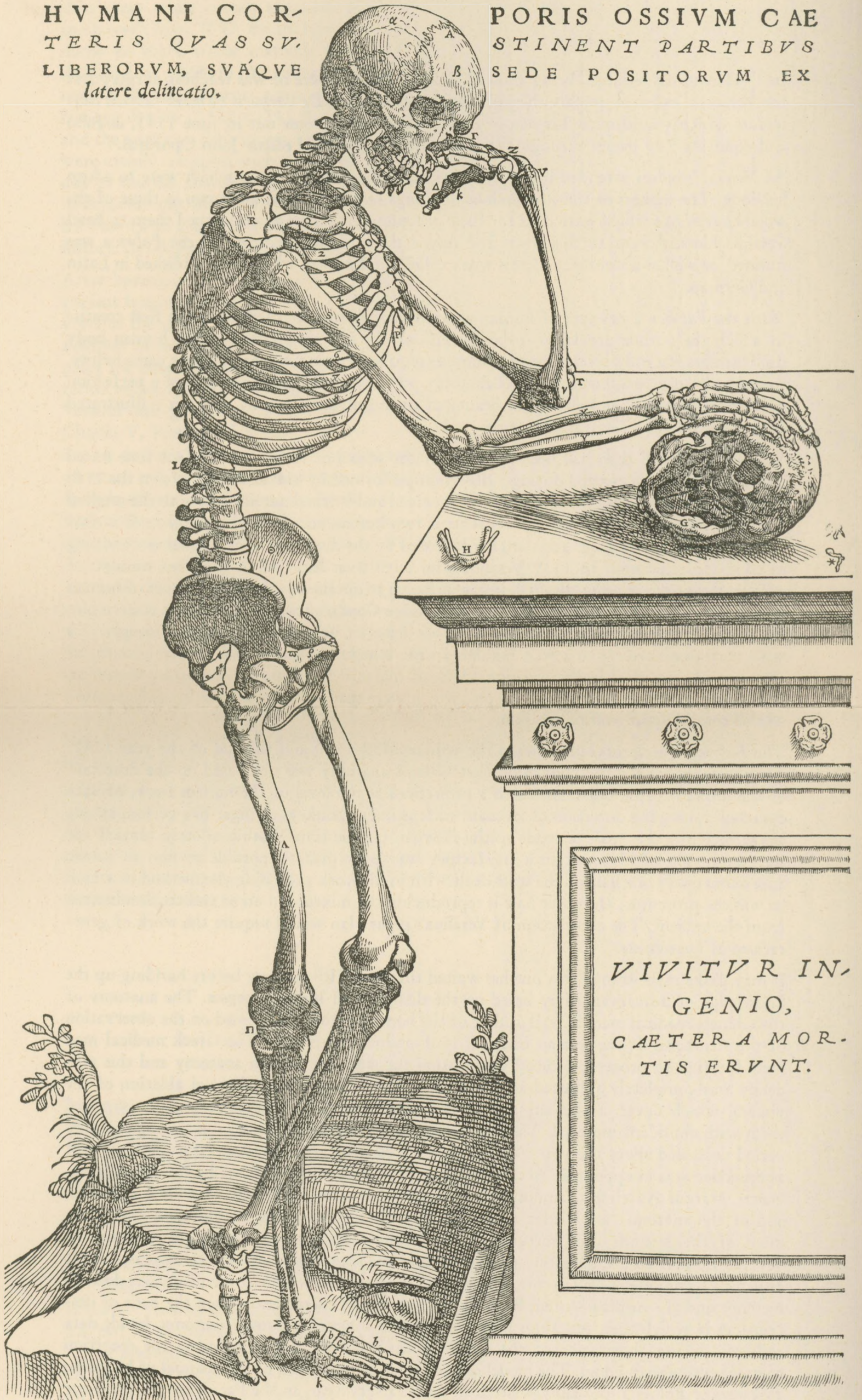
The *Fabrica* was composed between the winter 1539-1540 and the end of the year 1542. Then Vesalius gained the conviction that Galen's anatomy was not based on the dissection of the human corpse but constituted a projection, at the level of the human body, of data collected during the dissection of animals, such as dogs, monkeys or pigs. To a certain extent the same reproaches may be made to the *Fabrica*, for the time Vesalius allotted himself for the completion of his work in a satisfactory way only made it possible to him to realize approximatively one half of the stuff dealt with in his work according the method of which he was the promotor; the other half is reproducing the mixture of error and truth inherited from the ancient. The completion of Vesalius's great plan would require the work of generations of anatomists.

It may strike us as strange that one has waited till the XVIth century before building up the knowledge of human anatomy based on the dissection of human corpses. The anatomy of the Chinese medical men, as well as that of the homoeopaths, is not based on the observation of the structures of the human body; it is of philosophic nature. The Greek medical men were the first to proceed to direct observation for studying human anatomy and this tendency was completely followed at Alexandria where the practice of ritual ablation of the viscera, which never caused any anatomic interest among the Egyptian doctors, supplied them with abundant material. The interest shown for anatomic knowledge during this first period decreased about the year 150 B.C. and the Roman influence stopped its development as dissection was in opposition to the respect of the corpse prescribed by the Roman religion. Galen, Marcus Aurelius's famous doctor taught about the usefulness of animal dissection and of the anatomic knowledge of the latter with a view to the examination and treatment of the wounds and fractures of the injured. With great talent and diligence he devoted himself to the dissection of various mammals and he wrote several treatises about dissection technique and anatomic observation. In the glorious halo of the illustrious doctor's memory and the medical system built up by him these Galenic texts form the basis of descriptions in which their teachings were framed into a complex human anatomy, beside data collected during observation of the human body and facts observed during the dissection of monkeys, pigs and dogs. The model of such texts was supplied by the manual of Mondino da Luzzi of Bologna, probably written in 1316. Every year, in the Faculties, the professor in medicine proceeded to have dissected in presence of his students the corpse of an executed

(See page 6.)

HVMANI COR-
TERIS QVAS SV-
LIBERORVM, SVAQVE
latere delineatio.

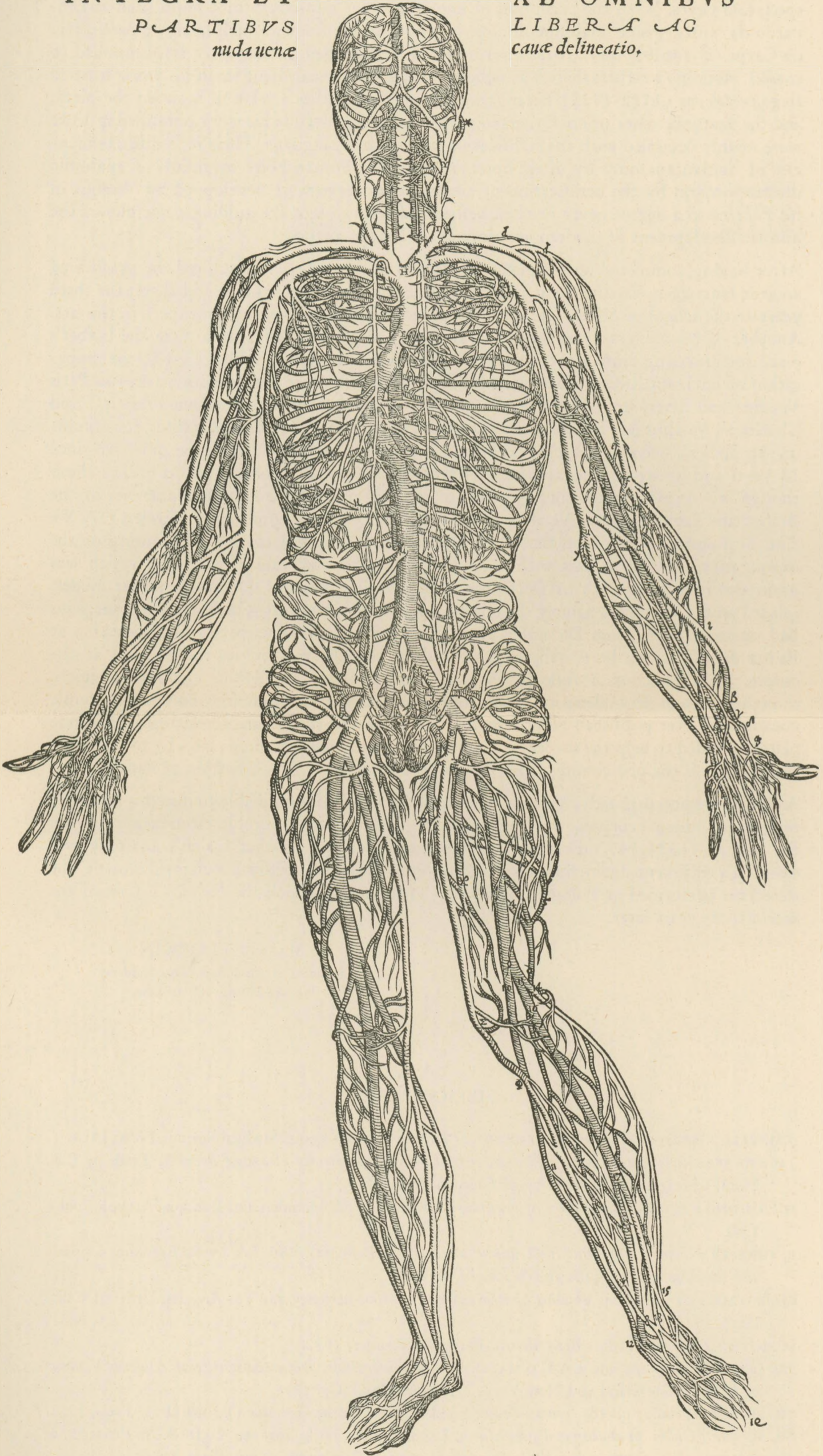
PORIS OSSIVM CAE-
STINENT PARTIBVS
SEDE POSITORVM EX



VIVITVR IN-
GENIO,
CAETERA MOR-
TIS ERVNT.

INTEGRA ET
PARTIBVS
nuda uenae

AB OMNIBVS
LIBERA AC
cauae delineatio.



man. The barbers dissected without any method and from his chair the professor read Mondino's text while nobody remarked the contradictions with the real facts shown before the spectators's eyes. With the exception of one or another non-conformist mind such as Leonardo da Vinci, whose anatomic discoveries only became known much later, or Berengario da Carpi (c. 1460-1530) a true forerunner of Vesalius being sufficiently critic-minded to correct Mondino's errors, there was nobody to speak or write about it. In his work entitled *Isagogæ breves* (1522-1523) Berengario da Carpi establishes a relation between the plates and the anatomic description. Others like Alessandro Benedetti in his work published in 1502 were mainly occupied with the codification of anatomic language. These reforming tendencies of human anatomy by direct observation of the human body by means of anatomic illustration and by the codification of anatomic language were developed by Vesalius in his *Fabrica* to a degree never reached before and we owe him the guiding principles of the historic development of modern anatomy as well as his method.

After having completed his secondary study at Louvain where he acquired the practice of ancient languages, Vesalius went to Paris to start his study in medicine and there, for three years at the school of Silvius, he learnt to dissect animals and became an expert in this art. Another of his masters, Guenther of Andernach, allowed his students to take the barber's place for dissecting human corpses and Vesalius dissected for him with a view to the preparation of his *Institutiones anatomicæ*. Nothing shows however that during his stay in Paris Vesalius had given up Galen's teaching. War having broken out between Francis I and Charles V, Vesalius left France and went to Louvain, probably to finish his study for obtaining his doctor's licence. There he performed a dissection which had not been practiced since 18 years and he wrote a paraphrase of Razès which probably constitutes his licence thesis though we are not having any evidence of it. The out-of-date Arabist tendencies of the Brabantine Faculty caused Vesalius to leave Louvain at the beginning of March 1537. We find him again at Padua on the 1st of December 1537 the date of the beginning of the examinations he had to pass with a view to obtain his doctorate in medicine, which was granted to him on the 5th of December. The next day Vesalius obtained a rather modest job at Padua University, namely the one of *explicator chirurgiæ* in which unknown surgeons had preceded him. From December the 6th to the 24th Vesalius performs a dissection at Padua during which he is collecting fresh data, then he reassembles the skeleton of the corpse. This dissection is followed by the publication of his *Tabulæ anatomicæ* which, though always under Galen's influence, supply us with the most extensive polyglot anatomic vocabularies ever published before. In the first place the *Tabulæ* are constituting anatomic plates intended to help the students. The skeleton reproduced on those plates by the sketcher Jean Calcar is the one coming from the corpse of Vesalius's first dissection at Padua.

As we have quoted already, Vesalius who until then had only been able to dissect a restricted number of human corpses, was benefiting of particularly favourable circumstances from the winter 1539-1540 onwards. Then he became convinced that Galen's anatomy was essentially different from human anatomy, conviction he openly proclaimed during the dissection performed at Bologna in January 1540 and of which the *Fabrica* informed the world three years later.

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