he obstacles that impede the path of those who seek to understand the arts and sciences and to achieve success in practicing them, most merciful emperor Charles, are many and serious. Not the least of them occurs, I think, when too wide a division is made between the disciplines of which some particular art consists; but a much worse one arises when the more experienced practitioners of the art cynically apportion its component disciplines among a variety of artisans.

For the result of this is that those who have set themselves some goal in this art embrace but one part of it, leaving out other things which are closely related to it and cannot be divorced from it. They therefore never achieve anything worthwhile, never reach their desired goal, and invariably fall short of the true nature of the art. Passing in silence over the rest, I shall devote my discourse to the art that looks after the health of mankind and that is at once the most useful, the most vital, the most difficult, and the most laborious of all the arts discovered by human genius.

The art of medicine began to be torn in pieces long ago, in the period after the invasion of the Goths\textsuperscript{2} and the reign of Mansur,\textsuperscript{3} king of Persia (under whom flourished those Arabs\textsuperscript{4} who are now rightly as familiar to us as are the Greeks). That was when one of its basic instruments, the technique of surgery, fell into neglect and was, as it were, handed over to laymen and people with no knowledge of the disciplines that go to serve the healing art. No more pestilent affliction could possibly have crept upon it. For although there were once three medical sects, namely the Logical, the Empirical, and the Methodical,\textsuperscript{5} yet their founders agreed in directing the aim of the art as a whole toward preserving health and casting out disease; and in directing toward this goal everything that

\textsuperscript{1}Holy Roman Emperor A.D. 1519–1556.
\textsuperscript{2}5\textsuperscript{th} century A.D.
\textsuperscript{3}Abu-Djafar al-Mansur, Caliph of Baghdad A.D. 754–775.
\textsuperscript{4}Especially the Persian scholar Avicenna (A.D. 980–1037); Vesalius’s chronology is elastic.
\textsuperscript{5}See Celsus: On Medicine, preface (1\textsuperscript{st} century A.D.); also Galen’s treatise for beginners On the Sects.

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they each in their own sect regarded as essential to the art, they made use of three means of aid. The first of these was regimen. The second was everything to do with the use of medicines. The third was surgery, which demonstrates more elegantly than the others that medicine consists in the addition of what is lacking and the removal of what is in excess, and which never fails to recommend itself for use in the treatment of health problems whenever in the medical field we review those things with whose help, as time and experience have shown us, this art is of prime benefit to the human race. This threefold system of healing was equally familiar to the physicians of all three sects, and they, applying their own hands to treatment (depending on the nature of the complaint), expended no less skill in employing surgical means than in drawing up a regimen of life or in distinguishing and compounding medicaments. This point is made particularly clearly in the books in which, of all his works, the divine Hippocrates wrote most fully concerning the task of the physician and concerning broken bones, dislocated joints, and injuries of that sort. Hipppocrates' foremost successor in medicine was Galen who, in addition to boasting frequently that he was placed in sole charge of the treatment of the gladiators at Pergamum and that, as he grew older, he would not allow his assistants to flay the apes he was going to dissect, often declares how much he enjoyed the practice of surgery and how sedulously he worked at it with the other physicians in Asia. No other ancient author can match the detail of the information that he has handed down to posterity concerning treatment by surgery and treatment by regimen or medicaments.

It was above all in the period after the devastating incursions of the Goths that all branches of knowledge, which previously had flourished gloriously and been practiced in the proper manner, began to deteriorate. This happened first of all in Italy, where the more fashionable physicians, spurning surgery as did the Romans of old, assigned to their servants such surgical work as their patients seemed to require and merely exercised a supervision over them in the manner of architects. Gradually the rest of those practicing true medicine began to stand aloof from the less pleasant parts (without detracting from their income or their celebrity) and rapidly parted company with the physicians of old, leaving the method of cooking and the whole preparation of diet to the patients' attendants, the mixing of medicines to the drug sellers and the practice of surgery to the barbers. Hence, as time went by, the theory of treatment became so pitifully distorted . . . .

Vesalius refers here to the treatises On the Physician, On Fractures, and On Joints.

A.D. 129–199; the greatest physician and medical writer of antiquity.
It is very rare to find a disease that does not require all three instruments together; in other words, there is an appropriate regimen to be instituted and something to be shifted by drugs and, failing that, by manual means. It therefore follows that beginners in the art must be urged in every way to take no notice of the whisperings of the physicians (if I may use the word) but to use their hands as well in treating, as the Greeks did and as the essence of the art demands, lest they convert a crippled system of treating into a curse on the whole of human life. They must the more diligently be urged to do this in that we see today people with a fully rounded medical training recoil from surgery as from a plague lest the medical Rabbis\textsuperscript{12} slander them before the uneducated mob as mere barbers and they be unable in consequence to attain to the income of those less-than-half-doctors or to their honor or to their status in the eyes of the common people. It is this low opinion that the common people have of surgery that is the main obstacle to our employing in this age the whole art of healing, with the result that we take upon ourselves only the treatment of internal affictions and strive to be doctors only in modest part. By this the whole of mankind (to put it bluntly) is the loser.

When everything to do with the composition of drugs was relegated to the apothecaries, the medical practitioners soon lost their knowledge of simples, a knowledge that was vital to them. So it is their fault that our surgeries are full of foreign words and false drugs and that so many elegant compositions of the ancients are no longer in use today, the details of many having been completely forgotten. They have thus created endless toil for the most learned men both of our time and of the years immediately preceding, who, applying themselves with untiring zeal to the knowledge of simple medicines, endeavored to restore this part of the art to its former glory. This is a most important contribution to the art. Among so many famous men I cite the example, rare in our own day, of Gerhard Weltwyck, secretary to your Majesty; he is outstandingly learned in a variety of disciplines and languages and the most experienced of our people in the study of plants.

But the most calamitous result of this unfortunate division of the means of treatment amongst a variety of artisans has been that it has inflicted a deplorable and most disastrous shipwreck upon the study of anatomy. Anatomy is an important part of natural philosophy; to it, since it embraces the study of man and must properly be regarded as the prime foundation of the whole art of medicine and the source of everything that constitutes it, Hippocrates and Plato attributed such importance that they did not hesitate to ascribe to it first.

\textsuperscript{12} The Hebrew word \\textit{nabbi} means “my teacher”; Vesalius applies it disparagingly here and elsewhere to the medical teachers of his own day.
place among the component parts of medicine.\(^{13}\) Previously this study was uniquely pursued by physicians, who strained every nerve in the process of mastering it; but when they handed over the task of surgery to others they lost the art of dissection, and this meant that the whole of anatomy went forthwith into a sad decline. For so long as the physicians declared that the treatment only of internal afflictions was their province, they considered that knowledge of the viscera was all that they required, and they neglected the fabric of the bones and muscles, and of the nerves, veins, and arteries that permeate the bones and muscles, as if it were none of their business. Furthermore, when the whole practice of cutting was handed over to the barbers, not only did the physicians lose firsthand knowledge of the viscera but also the whole art of dissecting fell forthwith into oblivion, simply because the physicians would not undertake to perform it, while they to whom the art of surgery was entrusted were too unlettered to understand the writings of the professors of anatomy.\(^{14}\) It is quite impossible that such people should preserve for us that most difficult and abstruse art which had been handed over to them; nor is it possible to prevent that evil fragmentation of the healing art from importing into our Colleges that detestable ritual whereby one group performs the actual dissection of a human body and another gives an account of the parts; the latter aloft on their chairs croak away with consummate arrogance like jackdaws about things that they have never done themselves but which they commit to memory from the books of others or which they expound to us from written descriptions, and the former are so unskilled in languages that they cannot explain to the spectators what they have dissected but hack things up for display following the instructions of a physician who has never set his hand to the dissection of a body but has the cheek to play the sailor from a textbook. So the teaching in our colleges is all wrong, and days are frittered away in ridiculous inquiries; a butcher in a shambles could teach a practitioner more than the spectators are shown amidst all this racket. There are even some colleges (I shall not name them) where virtually no thought is ever given to dissecting the human structure. So much did the ancient art of medicine decline many years ago from its former glory.

In the present age, however, which by the will of the gods is subject to your Majesty’s wise rule, things have taken a turn for the better, and medicine, along with all other studies, has begun so to come to life again and to raise its head from the profound darkness which enveloped it that in several universities it has beyond all argument come close to recovering its former glory. Nothing was more urgently required than knowledge of the parts of the human body, a

\(^{13}\) References not traced.

\(^{14}\) Vesalius frequently uses this phrase to refer to the ancient writers on anatomy.
knowledge that had become almost extinct; and therefore I, challenged by the example of so many outstanding men, decided to lend such assistance as I could by whatever means were available to me. Not wishing to be the only one who remained idle while everyone else was achieving such success for the benefit of common studies, or to let down my forebears, I decided to recall this branch of natural philosophy from the dead. My hope was that, though it would be impossible to treat this subject more perfectly in our time than in the time of any of the earlier professors of anatomy, yet at least the point might eventually be reached where one need not hesitate to assert that the modern knowledge of anatomy was comparable with the ancient, and that in this our time nothing had suffered a more serious collapse and made a more notable recovery than the study of anatomy.

This undertaking would never have been brought to a successful conclusion had I not, while studying medicine in Paris, personally set my hand to the task by attending one or two public dissections and acquiescing in the careless and superficial demonstration to myself and my fellow students of a few viscera by unskilled barbers. So perfunctorily was anatomy treated in Paris (where we first saw the successful rebirth of medicine) that I was moved to take matters into my own hands. Having been involved in a number of animal dissections under the famous Jacobus Sylvius (who can never be praised too highly), I was induced by the exhortations of my fellow students and my teachers to take public charge of the third dissection I ever attended and to perform it more thoroughly than was the custom. The next time I took it on (the barbers having now been dismissed from the task) I tried to demonstrate the muscles of the hand and to carry out a more accurate dissection of the viscera; apart from eight abdominal muscles (hacked up badly and in the wrong order) I had never been shown any muscle or any bone, much less an accurate series of nerves, veins or arteries. Then the tumult of war necessitated my return to Louvain, where for eighteen years the physicians had done no anatomy, even in their dreams; and there, with the intention of being of some assistance to the students of that university and of increasing my own expertise in a subject that, though very difficult, is in my opinion essential to the art of medicine, I dissected and expounded the human fabric in greater detail than I had at Paris; and as a result of this the younger professors at that university now diligently devote much serious effort to acquiring knowledge of the parts of the human body because they realize that this knowledge furnishes them with a quite outstanding resource for philosophical inquiry. At Padua, in the world’s most famous university, I have continued to devote much effort to my researches into the construction of the human frame; and because the study of anatomy is very relevant to the profession of surgery I have for the last five years been
lecturing on surgery. (I undertook this so as not to divorce myself completely from the rest of medicine, and my salary has been paid by the illustrious Venetian Senate, whose generosity to the world of scholarship is without equal.) I have performed frequent dissections both here and in Bologna and, discarding the ridiculous system of the schools, have given both the demonstration and the accompanying commentary myself, while seeking to insure that all the knowledge that has come down to us from the ancient world is made available and that there is no part of the body whose construction is still to seek.

It was the laziness of the medical fraternity that saw to it that the writings of Eudemus, Herophilus, Marinus, Andreas, Lycus, and other outstanding anatomists should no longer be available to us. We have not even a fragment of a single page of any of the more than twenty illustrious authors mentioned by Galen in Book II of his commentary on Hippocrates: The Nature of Man. Less than half of Galen’s On Anatomical Procedures has been preserved from death. As to those who came after Galen, in which class I place Oribasius, Theophilus, the Arabs, and all of our own writers whom I have so far read, everything worth reading in their books was borrowed from Galen. I swear that anyone with some experience in dissecting can see that they had never undertaken to dissect a human body. In fact the foremost of them, absorbed in the stylistic quality of their own writing and relying entirely on dissections incompetently carried out by others, produced costly summaries of Galen and did it very badly, refusing to depart a fingernail’s breadth from them while they sought to grasp his meaning. They state at the beginning of their books that their writings have been stitched together entirely from the teachings of Galen and that everything they say is Galen’s, adding that if anyone finds anything wrong in them Galen must bear part of the blame. Yet such faith did they all have in him that there has never been a single practitioner who believed that even the most trifling error had ever been found in Galen’s writings or ever could be found in them. In fact, however, (leaving aside the fact that Galen often corrects himself and, in later books written when he had become more expert, more than once points out some piece of negligence committed in earlier books, and even directly contradicts himself) I am quite certain, on the basis of the art of dissection as now reborn combined with a careful reading of Galen’s works and

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15 Galen mentions them in two groups: (i) the Ancients: Diocles, Praxagoras, Erasistratus, Plutonicus, Philotimus, Mnesitheus, Dieuches, Chrysippus, Aristogenes, Medeus, Euryphon; (ii) later figures who made important contributions: Herophilus, Eudemus, Marinus, Numidianus, Heraclianus, Pelops, Quintus, Satyrus (“my teacher”), Lycus. See K XV 135 ff.

16 The original text of Books I–VIII and part of IX is extant; the rest of the fifteen books are known only in an Arabic translation.
many textual restorations thereof for which I make no apology, that he himself had never cut open a human body and furthermore that, deceived by his apes (although he did chance upon two human skeletons) he frequently and quite wrongly finds fault with the ancient physicians who actually did their training by dissecting human material. For indeed one can find very many instances in Galen where he was wrong even about his apes; not to mention the remarkable fact that, granted the infinite multiplicity of differences between the organs of the human and the simian bodies, he yet noticed none of them except in the digits and the knee joint. Even these he would no doubt have missed if they had not been obvious to him without any need for human dissection.

At this point, however, I have no intention whatever of criticizing the false teachings of Galen, who is easily first among the professors of dissection, for I certainly do not wish to start off by gaining a reputation for impiety toward him, the author of all good things, or by seeming insubordinate to his authority. For I am well aware how upset the practitioners (unlike the followers of Aristotle) invariably become nowadays, when they discover in the course of a single dissection that Galen has departed on two hundred or more occasions from the true description of the harmony, function, and action of the human parts, and how grimly they examine the dissected portions as they strive with all the zeal at their command to defend him. Yet even they, drawn by their love of truth, are gradually calming down and placing more faith in their own not ineffective eyes and reason than in Galen’s writings; they are making careful notes of the contradictions, which they have not simply begged from other authors and which are supported by something better than a mere heap of authorities, and are sending the notes to their friends in various places with a firm but friendly exhortation to carry out their own investigation and so gain knowledge of the real anatomy. As a result there is hope that this last will soon be cultivated in all universities as it was once practiced in Alexandria long ago in the days of Herophilus, Andreas, Marinus, and the other famous experts in dissection.

I have done my best to bring the assistance of the Muses to this process by setting out afresh our knowledge of the parts of the human body in seven books; this is over and above my other publications on this subject, which certain plagiarists, thinking me well away from Germany, have passed off as their own. The order of these books is that in which I normally treat the subject in the congregation of eminent men in this city and in Bologna. This means that those who were present at my dissections will have notes of what I demonstrated and will be able with greater ease to demonstrate anatomy to others. But the books will be particularly useful also for those who cannot see the real thing, since they consider at sufficient length the number of each part

"For the story see Procedures 1 2."
of the body, its position, shape, size, substance, connection with other parts, use, function and many similar matters; all of these are aspects of the nature of the parts into which we normally inquire when dissecting. The method of dissecting the dead and the living is also described, and pictures of all the parts are incorporated into the text of the discourse, so as virtually to set a dissected body before the eyes of students of the works of Nature.

Book I contains my exposition of the nature of all the bones and cartilages, which are studied first by students of anatomy because they support and hold firm the remaining parts (described in the other books).

Book II considers the ligaments (by means of which the bones and cartilages are bound together) and the muscles (which endow us with voluntary motion).

Book III embraces the intricate series of veins (which bring to the muscles and bones and other parts the blood by which they are individually nourished) and of arteries (which regulate the mixture of innate heat and vital spirit).

Book IV sets out the distribution of the nerves that go to the muscles and also the off-shoots belonging to all the other parts.

Book V relates the construction of the organs that serve nutrition (which is achieved by food and drink) and also, because they are found in the vicinity, the organs fashioned by the almighty Creator of the world for the continuation of the species.

Book VI is devoted to the heart (which foments the vital faculty) and the parts that serve it.

Book VII describes the harmony of the brain and the organs of sense, without repeating the arrangement of the nerves that take their origin from the brain (for which see Book IV).

In determining the order of these books I have followed Galen’s instructions; his view was that the account of the muscles should be followed by the anatomy of the veins, arteries, nerves, and lastly the viscera. For the purposes of a beginner, however, one might argue with some justification that the account of the viscera should have accompanied that of the distribution of the vessels, as in my Epitome, a work that I intended as a sort of pathway through these books and an index to the things demonstrated in them; it is graced by the splendor and fortified by the authority of your son His Serene Majesty Prince Philip who, as a living exemplar of his father’s virtues, gives promise of everything that is to be desired in the world’s finest ruler.

\[^{18}\text{See Pro section I.2.}\]
\[^{19}\text{Published shortly after the Fabrica in 1543.}\]
\[^{20}\text{Felipe II of Spain, reigned A.D. 1556–1598.}\]
I am not unmindful of the opinion of certain people, who strongly deny that even the most exquisite delineations of plants and of parts of the human body should be set before students of the natural world; they take the view that these things should be learned, not from pictures but from careful dissection and examination of the actual objects. In adding to the context of my discourse such detailed diagrams of the parts (and God grant that the printers will not ruin them!) it was never my intention that students should rely on these without ever dissecting cadavers; rather I would, as Galen did, urge students of medicine by every means at my command to undertake dissections with their own hands. If the custom of the ancients, who trained their lads at home in carrying out dissections as much as in writing the alphabet and in reading, had been brought down to the present time, I would be very happy that we, like the ancients, should dispense not only with pictures but with commentaries as well; for the ancients only began to write about anatomical procedures when they decided it was permissible to communicate the art, not only to one’s children but also to grown men from other families who were taken on because of their good qualities. As soon as the custom of training lads in dissection was discontinued, forthwith it came about of necessity that they learned anatomy less well, lacking the training that they used to begin in childhood. And so when the art dropped away altogether from the sons of Asclepius and went downhill for many centuries, there was a need of books to preserve its theory untouched.

In fact, illustrations greatly assist the understanding, for they place more clearly before the eyes what the text, no matter how explicitly, describes. This fact is well known in respect of geometry and other branches of mathematics. But in addition our pictures of the parts of the body will give particular pleasure to those people who do not always have the opportunity of dissecting a human body or who, if they do have the opportunity, are by nature so squeamish (a very inappropriate quality in a physician) that, although they are fascinated and delighted by the study of man (which attests, if anything does, to the wisdom of the infinite Creator of the world), yet they cannot bring themselves to the point of ever actually attending a dissection. But in any case I have throughout the work pursued single-mindedly the one aim of giving assistance to as many people as possible in a matter that is extremely recondite and no less arduous, by detailing as accurately and completely as I can the investigation of the fabric of the human body, which is formed, not from ten or twelve different parts (as might appear at a casual glance) but from something like a thousand. I aim also to do something not without value for students of medicine by interpreting those books of Galen which have been preserved to posterity and which, like all the monuments of his divine genius, now need the work of an expositor.

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21 This is the burden of his *On Anatomical Procedures*.
22 Galen thus designates his predecessors at *Procedures II 1*.