THE "FABRICA" OF ANDREAS VESALIUS

A QUATERCENTENARY TRIBUTE

BY

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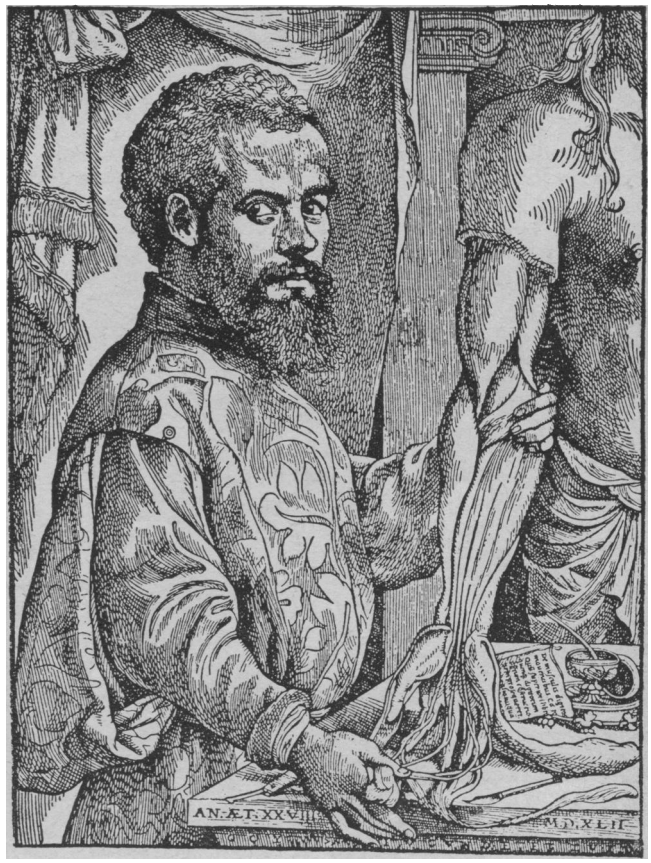
The month of June, 1943, marks the four-hundredth anniversary of the publication of one of the epoch-making works in all medical literature. Some time in the month of June, 1543, there appeared from the press of Joannes Oporinus, Professor of Greek at Basle, the *De Humani Corporis Fabrica* of Andreas Vesalius. It behoves us at this time to cast our minds back through the centuries, and to view in the light of later discoveries the work of this ardent reformer of anatomy and pioneer of the scientific spirit.

Vesalius was born in Brussels on Dec. 31, 1514. The son and descendant of court physicians and apothecaries, he received the thorough classical education of the age, studied medicine at Montpellier and Paris, and then settled for a time at Louvain. In these schools the trammels of the Middle Ages had not yet been broken by the spirit of the Renaissance. Anatomy was taught according to the views of Galen; and, indeed, apart from the work of Mundinus two centuries before, and by then largely forgotten, there had been practically no development in anatomical thought throughout the Middle Ages. Mundinus published in 1316 a short work—in Latin of course—called *Anathomia*. Roth, the biographer of Vesalius, considers that it is well arranged and rich in "positive" anatomy. The terminology of Mundinus was derived mainly from the old Arabian writers. As an anatomist he had the virtue of carrying out his dissections in person, but as the years passed the professors who succeeded him undertook less and less of the practical work. An Italian translation of the *Anathomia*—the *Fasciculo di Medicina*—was published in 1493, and a remarkable illustration in that book shows the method of teaching anatomy two decades before the birth of Vesalius. The duty

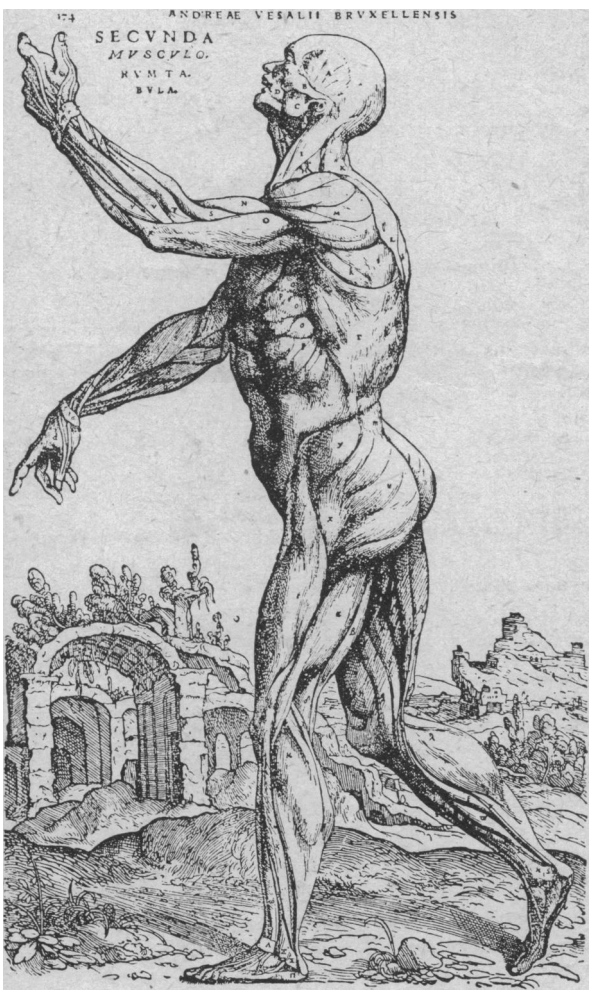


of the professor was to comment, from the altitude of his "chair" on the writings of Galen, while his assistants below him dissected the body. Students never handled the subject at all. From his childhood Vesalius had had an urge for the dissection of all sorts of animals, and with such a system of teaching he could make little headway in the study of human anatomy. Subjects for dissection were difficult to obtain, and he has left an account of one of his expeditions to steal a corpse from a gibbet. Vesalius was attracted by the new learning of Northern Italy, and in 1537 we find him at Venice, where he was in the schools with Ignatius Loyola. While he was studying there he tells us that he treated patients, "not without the greatest expectation," by the new method of the China root. When he was 23 years old he graduated in medicine at Padua, and on Dec. 6, 1537, he was appointed professor of surgery, with the direction of a school of anatomy, at that university.

The next five years were pregnant for the future of medicine. At Venice Vesalius had met a compatriot, an artist, Jan Stephan van Calcar—*insignis nostri seculi pictor*, as Vesalius calls him—and in 1538 the two men collaborated in the production of six anatomical diagrams. Such "fugitive sheets" had been not uncommon in previous years, but those of Vesalius were anatomically and artistically a marked advance on their predecessors. Although they were extensively printed and pirated, all but two bound sets seem to have disappeared. They were reprinted in facsimile—thirty copies only—by Sir William Stirling-Maxwell in 1874, and in 1920 Holl and Sudhoff reproduced them by the photostat process. Vesalius was in 1538 still largely influenced by Galen. In fact in that year he edited a revised version of the *Institutiones anatomicae* of Guinterius, a pronounced Galenist and a former teacher of Vesalius at Paris. (Five years later he will tell us in the *Fabrica* that he is able to demonstrate more than two hundred errors of Galen.) He was, however, already famous, and he had evolved the modern or Vesalian method of studying and teaching anatomy.

The 1543 edition of the *Fabrica*, apart from its superb detailed descriptions of the "fabric" of the human body, contains three features—the Portrait, the Tabulae, and the Title-page—which are of vital interest in connexion with Vesalius himself and his method. The Portrait (see Fig.) was drawn by Calcar—

as were all the other illustrations in this magnificent book. It has long been considered to be one of the finest woodcuts of its age. The head is essentially Flemish in type, and the firm thick-set lips and piercing eyes seem to throw out a challenge to the world. The dissection chosen and the text of the scroll combine to exhibit the confidence of Vesalius in his advance on Galen. The disproportions in the design have been ascribed to the conviction of Vesalius that in anatomical matters the head is more important than the hand, but Prof. Charles Singer has recently expressed the view that only the drawing of the head was by Calcar, and that the design was the work of an inferior craftsman. It is interesting to note that, of the twenty-eight oil paintings and the many other pictures of Vesalius which still exist, this *Fabrica* portrait is the only one which is considered to have been drawn from life. There is no doubt that Vesalius thought much of it; he used the original wood block



not only for the *Epitome* and the *Fabrica* of 1543 but also for the *Letter on the China Root* of 1546 and the second edition of the *Fabrica* of 1555.

The most important of the tabulae in the *Fabrica* are the three plates dealing with the skeleton and the fourteen plates of the muscles. The second muscle tabula is reproduced here. These superb drawings are really representations in line of Vesalius's conception of the science of anatomy. The body is a piece of vital mechanism, and the artist—undoubtedly inspired and instructed throughout by Vesalius himself—has positioned his dissected subjects so as to suggest the functions of the various parts. A noteworthy feature of the 1543 edition of the *Fabrica* is the landscape background in each tabula. The tabulae can be arranged in a certain order so as to give a complete panorama with a small additional picture. Reproduction gives little indication of the firmness of line and freshness of these tabulae as they appear in the original copies of the work. They certainly marked an enormous advance in the art of anatomical illustration, with the possible exception of the drawings of Leonardo da Vinci, which were not available until centuries later.

The title-page of the 1543 edition of the *Fabrica* is reproduced on page 795, but space does not permit of a discussion of the many interesting features shown by this famous woodcut. It should be noted that Vesalius is carrying out with his own hands the dissection of the female subject. The ape on the left and the dog on the right symbolize the master's readiness to use animals if the supply of human subjects failed; indeed, many of the smaller illustrations in the *Fabrica* are of animal parts, and the book contains a section devoted to experiments on animals. The erect skeleton is perhaps an expression of his devotion to osteology as the basis of the human fabric. The naked man by the column on the left—probably used for the demonstration of surface anatomy—appears clothed in the inferior drawing of the title-page to the second edition of the *Fabrica* (1555), in which other alterations were also made. This famous plate expresses to perfection the Vesalian method of teaching anatomy, and the enthusiasm with which the teaching was received by the students of Northern Italy.

With the *Fabrica* Vesalius issued an *Epitome*, which is not merely a summary of the great work. It was intended more for artists than for students of medicine, and consists of a short text followed by an anatomical atlas. The illustrations and tabulae are frequently different from those in the *Fabrica*, and they do not appear in the text itself. There is evidence that many of the *Epitome* illustrations were completed later than those of the *Fabrica*. In various places Vesalius explains that the *Epitome* is an appendix, an index, and a compendium to the *Fabrica*. The two books are twin works, each completing and explaining the other. The *Fabrica* was finished—as the dates on the portrait show—in 1542, when Vesalius was 28 years of age. It was severely criticized by some of his old teachers, and, as he tells us in his *Letter on the China Root*, in a fit of despair he burned his books and sought service with the Emperor as Court Physician. His life with the army in the wars, his ill luck over the supposed body of a corpse which came to life, and his enforced pilgrimage to Jerusalem need not detain us. He died on the island of Zante in 1564.

There is no doubt that the *Fabrica* is one of the great books of all time, although the specialized nature of its subject has prevented its wide recognition as such. In its nearly seven hundred beautifully printed pages it contains over three hundred original illustrations, many of the highest merit. The new spirit was abroad at the time, and others were working on similar lines. Eustachius of Rome had within ten years of the publication of the *Fabrica* completed a magnificent series of forty-seven anatomical tabulae, engraved on copper. A number of these were more accurate than the illustrations of Vesalius, but one has only to compare the muscle tabulae of the two men to appreciate the superiority of design and drawing in those of Vesalius. Unfortunately the tabulae of Eustachius were not published until over a century and a half after his death. To Vesalius the real advance in anatomy is due. Of numerous structures or organs—for example, the sternum, the bones of the skull, many muscles, and the uterus—he gave descriptions which were long unsurpassed. He was the first to introduce illustrations to direct attention to comparative anatomy, and in many passages he is frank enough to admit that he had not actually seen in the human the features which he describes, but had demonstrated them in apes. Anatomy, long dead, was resurrected as a science in the month of June, 1543.

On a tomb in one of the tabulae Vesalius had inscribed *Vivitur Ingenio, Caetera Mortis Erunt.* Though the remainder of his own bodily work may have perished, the spirit of his great accomplishment lives to-day. We may perhaps be reminded, not unprofitably even now, that in an age when the dead hand of medievalism lay heavy on knowledge of the human frame the whole science was born anew and advanced beyond recognition by the faith, the enthusiasm, and the unremitting labour of a single man.

I am indebted to Dr. Charles Singer and his publishers for kind permission to reproduce the three figures from his book *The Evolution of Anatomy* (Kegan Paul, Trench, Trubner and Co. Ltd., 1925).