An outline of the history of art in its relation to medical science : being the substance of an introductory address delivered at the Medical and Physical Society of St. Thomas's Hospital, October, 1885 / by William Anderson.

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AN OUTLINE OF THE HISTORY

OF

ART IN ITS RELATION TO MEDICAL SCIENCE.[1]

Being the substance of an Introductory Address delivered at the Medical and Physical Society of St. Thomas's Hospital, October, 1885.

By WILLIAM ANDERSON.

Medicine and Art, historically considered, have had little in common except their remote antiquity; for while Art in the early essays to attain its ideal was making some of its noblest records Medicine lagged behind century after century, wasting the precious years over idle superstitions or in gnawing the dry bones of ancient dogmas; and it was not until the sculptor, the architect, and the painter had done their best that the physician began his advance along the true path of science. It is only upon a scale almost as liberally constituted as the periods of geology that we could venture to compute the lapse of time since our forefathers portrayed the great bear, the mammoth, and the reindeer in the caves of southern France, and made their first endeavours to recognise, avert,

[1] Neither botany nor comparative anatomy has been included amongst the branches of medical science considered in this sketch, each of these subjects having a special history and literature of its own, for the most part distinct from the history and literature of medicine.

and remedy the symptoms of disease, but we must be satisfied to tell by centuries, and upon the fingers of one hand, the term of existence of accurate pictorial or toreutic illustration of even the most rudimentary facts of human anatomy, so far as these facts concerned the study of medicine.

The evidence as to the utilisation of art by the physician during the historical periods anterior to the fourteenth century is almost entirely negative. There is little or nothing to indicate that the ancient teachers were accustomed to assist the exposition of their doctrines by drawings and models, for no such aids to description are alluded to in the writings of Hippocrates or Galen, or in any of the early medical authors (unless the doubtful passages quoted by Hoffmann and Schultze from the 'Historia Animalium' of Aristotle be accepted as testimony that anatomical figures were employed for the purpose of instruction by the Stagirite), and there is little doubt that had there been anything of the kind worthy of preservation some record of the fact would have been handed down by the almost unbroken succession of ardent disciples who treated as products of divine inspiration every relic and tradition of the great fathers of medicine. The existence, however, of a certain indirect contact between art and medical science may be admitted. Caricatures of surgical deformity are perhaps as old as caricature itself: the wen, the blind eye, the crooked back, appear in drawings of very early date; and the first wart that grew upon the nose of man may well have proved an irresistible temptation to any juvenile draughtsman of the period who felt competent to register his impression of the phenomenon in chalk upon the walls of Memphis or Luxor; but in cases such as these, however strongly the artist may have chosen to accentuate the morbid at the expense of the normal, his design is no more to be received as a tribute to pathology than is the phallic imagery of prehistoric races to be classed with modern illustrations of anatomical or physiological research.

If we carry back the inquiry to the most remote civilisations, as of Egypt, India, Greece, and China, we find the study of medicine held everywhere in great honour, and in some of these countries art, particularly in its toreutic branches, rising to a very

high level, but the artist and the physician never combined their forces. It was perhaps amongst the Egyptians that medicine first took its place as a learned profession, and, according to Eusebius, it even numbered in the ranks of its professors King Athothis, of the First Dynasty, who is said to have been the author of a work upon anatomy. It was, however, a closed guild of sacerdotal specialists, and was regulated as to the details of practice by a stern and rigid control that tended, and perhaps was designed, to stifle all originality and progress. How far its theories may have been supported by dissections of the lower animals we do not know, but the opportunities of direct observation of human anatomy were confined to the degraded and ignorant class of professional embalmers who were in no way affiliated to the doctors. There is at any rate nothing to show that the knowledge of the persons who took under their charge the therapeutics of the various portions of the frame of suffering man was sufficiently developed to be susceptible of exposition in any material degree by model or drawing.

A scientific appreciation of the subject was more nearly approached by the Hindus, who, as the authors of the 'Ayur Vêda' and its commentaries, may be regarded as the founders of the prototype system of medicine. The 'Ayur Vêda,' which is supposed to have been written about 3000 years ago, is lost, but the commentaries upon it, named after their authors, 'Charaka' and 'Susruta,' still remain. Even such a brief outline of these as may be found in Wise's 'History of Medicine' will be sufficient to show how broad was the grasp by which the originators of the work had seized the principles of medical research; and it will be found that the 'Susruta' is not only remarkable for numerous anatomical references, but impresses strongly the truth that the physician could only succeed in mastering his profession by combining practical dissection with the study of books. The way had been well pointed out, but the successors of these intellectual giants mistook the finger-post for the goal and stopped for ever to worship at the opening of the road to knowledge. Art unfortunately had made no appearance either in the 'Susruta' or the 'Charaka,' and it was not likely that the writers of later years, who were content to do no more than

comment upon these commentaries, would have ventured to remedy, even if they had perceived the defect.

The Greeks, like the Egyptians, had a profound veneration both for medicine and for art. Sculpture, in the hands of artists, attained a perfection that has been at once the inspiration and the despair of later Europe; but medicine, in the hands of the priesthood, had in the same period arrived at little more than the worship of Æsculapius till a new era began with the advent of Hippocrates. It is unnecessary to dwell upon the influence of the "Dogmatic School," extending as it did to the Alexandrian Academy of Herophilus, Erasistratus, and Serapion in the fourth century before the Christian era; to Rome two hundred years later; to Constantinople between the fourth and seventh centuries A.D.; to the Arabian School from the seventh to the twelfth centuries; and to every part of Europe within still more recent years; but whether it worked for good or for evil it appears to have worked without support from picture or model. There is, indeed, a single example of illustrative art that has descended to us, an image showing the abdominal and thoracic organs, disinterred in Rome about 140 years ago from the ruins of the villa of Antonius Musa, one of the physicians of the Emperor Augustus; but this, despite the fact that dissection of the human body is said to have been practised in the Alexandrian School as early as 323 B.C., merely represented the "Galenical" view of the anatomy of man and negatived the existence of any really scientific form of instruction.

Passing to the Chinese, who were always distinguished by the courage with which they carried out their fictions in detail, we have evidence that both diagrams and models were employed from a very remote period, perhaps over two thousand years ago, in teaching an almost purely imaginative anatomy. It is to a physician named Pien Ts'iao, who is said to have flourished about the sixth century before Christ, and to have dissected the human body, that the "discovery" of non-existent channels of circulation for the blood and vital spirits, and the invention of the wildly elaborate theory of the pulses are attributed; and it is believed that the anatomical diagrams that may yet be seen in Chinese and Japanese books, and some of which demonstrate in the midst of absurd errors a certain acquain-

tance with the viscera of the lower animals, date from this time. It is perhaps less marvellous that a physiology, a pathology, and a complex scheme of therapeutics should have been founded upon so audacious a fraud as Chinese anatomy, than that the gigantic system of quackery should even in our own day number far more believers than all the science of the West. Fortunately for the reputation of true Chinese art, which at one time was far in advance of that of contemporary Europe, it can scarcely be convicted of association with medicine, for the diagrams in question were the work of unskilled hands and as clumsy and untruthful as the pseudo-medical lore to which they form a fitting appendage.

Chinese medicine was adopted by Japan, together with the art and letters of the middle kingdom, but the younger nation has added much of its own to the borrowed fund, and has been the first to perceive the error of its ways. It is remarkable that the earliest known drawings relating to pathology were the work of a famous Japanese painter of the twelfth century, who has given us a series of illustrations of disease, nearly all of which were probably drawn from life. In this curious collection we may trace representations of carbuncle, enlargement of the patellar bursa, paraplegia, gangrene, acne rosacea, intestinal fistula, gastric fistula (a man whose mouth is obliterated is shown introducing food through an aperture in the region of the stomach), and other conditions, while many drawings that are less open to identification still appear to be conscientious attempts to hand down the appearances presented to the artist. The roll, a copy of which is preserved in the British Museum, is worthy of a closer study than can be devoted to it here.

As might be conjectured, the establishment of medicine upon a scientific basis in Europe, after the long intellectual paralysis induced by a blind reverence for antiquity, was a tedious and oscillating process. Until the beginning of the fourteenth century, when the restrictions against dissection were abolished, the writings of Hippocrates, of Galen, of Aretæus, of Paulus Egineta, and a few other venerated but unsound authorities, constituted the foundation of the theory and practice of the physician. Anatomy was traditional

and in great part fictitious; physiology little more than a farrago of crude conceits and baseless dogma; medicine a dismal combination of empiricism, superstition, and filthy charlatinism, tinged with a slight infusion of the black art, but happily relieved by a few sparkles of genuine observation; and surgery, as we now understand the term, existed only in a rudimentary form and in a few narrow specialties. That some of the older writers dissected the human frame a little and discoursed upon the importance of dissection a great deal; that others examined the arrangement of the internal organs of the lower animals in a moderately scientific spirit, is beyond question, but the difficulties in the way of a large appreciation of the subject were for many a weary age enormous—and triumphant. An absurd physiology based upon an inaccurate anatomy, and a medicine and surgery resting partly upon the one partly upon the other, could have no more stability than a pyramid standing upon its apex. Art could find no foothold here.

But the artists were far more profound observers than the physicians. The sculptors of ancient Greece, more than five centuries in advance of the Christian era, and some generations before Hippocrates commenced the rescue of medicine from priestcraft, had acquired a knowledge of the superficial forms of anatomy, that appears to have exhausted the possibilities of the subject. Let anyone amongst us who has directed his attention to muscular anatomy and physiology examine the stupendous relics of Greek art in the Elgin Collection at the British Museum, which are attributed to the chisel of Pheidias (died 432 B.C.), or such later works as the "Laocoön" and the "Dying Gladiator," and his pride of modern learning will be humbled when he perceives how much the creators of these masterpieces, separated as they were from our civilisation by upwards of twenty centuries, could teach our learned selves. We, with our shelves of text-books and our daily opportunities of direct investigation, know only the anatomy of the dissected corpse, but they, unaided by the scalpel, saw infinitely more than this, and were able to reproduce in bronze and marble all the subtle contours indicating life and action, with a truth that was more than science—it was inspiration.

Nor was this artistic mastery of anatomical form in sculpture limited to Europe. Apart from the Greek influences left by the Indian conquests of Alexander the Great in the glyptic art of the Punjaub, and the figures known as "The Pilgrim" and "The Scribe," which attest the capacity of Egyptian sculptors before their art had been reduced by meddlesome edicts to a mere question of mensuration, there are still in existence at Nara in Japan proofs of the same genius of observation in certain carvings of Buddhist idols executed between the seventh and eleventh centuries, that would have done no discredit to the author of the Farnese Hercules.

With such monuments of minute and keenly appreciative study of nature before them, it is difficult to understand how the early leaders of the medical world, many of them men of high intellectual powers, should have rested satisfied with the complacently wrongheaded, pedantic treatises that nearly all they have thought fit to render as the account of their anatomico-physiological stewardship. The need for closer research was at least as pressing then as now, for the mortality from doctors and diseases must have been ghastly in those long ages, while sculptors saw and thought, and physicians dogmatised and quoted the ancients. It is, however, sufficient for our present purpose to show that anatomical knowledge, so far as it was exact, lay outside the medical profession, and that the artist-anatomist owed nothing and lent nothing to the physician.

Advancing at a stride to the period of revival of anatomical study in Mediæval Europe, we may classify the periods or stages of art in relation to medicine as follows:

1. The period of accredited utilisation of diagrams in medical teaching: nearly coincident with the fourteenth century.
2. The period of artistic and schematic anatomy: extending from the early part of the fifteenth to the beginning of the sixteenth century.
3. The period of accurate and artistic illustration of medical science by wood engraving: reaching to the middle of the sixteenth century.
4. The period of artistic engraving in copper: terminating in the second decade of the present century.

5. The modern period of multiplied technical resource in reproduction, with painstaking efforts to secure diagrammatic clearness of representation.

With the opening of the fourteenth century the new era of science and art was at hand, but the light in these early days was feeble and flickering. The first medical teacher definitely stated to have employed drawings as a means of instruction was a surgeon to Philippe le Bel, of France, named Henri de Medonville or Henricus de Hermondavilla, who flourished at the beginning of the fourteenth century. On the authority of Guy de Chauliac, one of his pupils, we learn that Medonville was in the habit of illustrating his demonstrations of anatomy by pictures or diagrams, thirteen in number, but we are quite in the dark as to the scientific or artistic qualities of these. We may, however, infer that the designs were traditional rather than realistic, as Chauliac's own knowledge of anatomy appears to have been limited to the teachings of the Arab School, which were Galenical in origin. However this may be, the innovation bore little fruit, for it was not until many generations later that we hear of a repetition of the experiment. The honours of the anatomical "renaissance" rest, not with Medonville, but with his Italian contemporary Mondino de' Luzzi (died 1318 or 1326), who, seeking to place the science upon a better footing, added to the study of the orthodox authorities of ancient times an experience, probably a very small one, derived from dissections of his own, and produced a 'Compendium' that held the first place in the schools for upwards of a hundred years. His work was devoid of illustrations or reference to diagrams, but Bertuccio, his successor in the School of Bologna, is said to have lectured with the aid of pictures, and it is possible that the practice descended to him from the older teacher. In surgery the manuscript of John Ardennes (Brit. Mus.), which also belongs to the fourteenth century, may be mentioned as including a few roughly sketched outlines of instruments and apparatus, but figures of this kind may be of much earlier date, and some have been attributed to the Arabian Abu'l Kasem in the eleventh century.

The first really important example of anatomical design in

its applications to medicine belongs to a period no earlier than the fifteenth century, and brings us into contact with one of the most towering and versatile figures in the history of art, Lionardo da Vinci—painter, sculptor, architect, scientist, poet, and musician. It was this richly endowed man who first amongst artists judged it profitable to place himself *en rapport* with the representatives of medical science. How great was the debt that anatomists owed to him we may never learn, but some idea as to the quality of the contributions of his pencil may be gained by a study of the few precious relics that have been spared to us. It is known that he became intimately associated with the physician Marcantonio della Torre, of Ferrara and Padua, and that he made for him numerous drawings to illustrate an anatomical treatise, but the untimely death of Marcantonio in 1506 or 1512, dissolved a connection which, under better auspices, might have raised him to the eminence afterwards occupied by Vesalius. As it was, the great work remained unfinished, all that had been written was lost, and with it disappeared the drawings of Lionardo da Vinci. Nearly all that we now possess of the anatomical work of the painter are a small series of representations of the bones and muscles, but these, if not scrupulously exact, yet stand unrivalled in vigour and expressiveness, and the scientific spirit of their design is manifested by the addition of analytical diagrams framed for the demonstration of muscular action, a subject on which the artist is said to have written a special treatise, another lost treasure. It may be worth while to call attention to a curious outline forming suite with these, a vertical section of two figures in the act of sexual congress. The motive may shock the over-sensitive moralist, but the aim of the sketch was purely physiological, and the result is objectionable only on the grounds of incorrectness of anatomical detail. The chief interest of the drawing lies in the fact that, unlike in the companion pictures, which were undoubtedly taken from actual dissections, the structural features were derived from the Galenical descriptions, a fault compromising to the reputation of Marcantonio, who, if he be held responsible for the scientific errors, could not have extended his investigations to the visceral anatomy of man.

The period of Lionardo and of the succeeding generation was a glorious one in the history of art, for while the great Tuscan was yet in the vigour of his age, a reflex of his many-sided genius appeared in Michelangelo Buonarotti—at once painter, sculptor, architect, engineer, and poet—and the younger man had reached the zenith of his fame when his predecessor, full of years and honours, expired in the arms of the monarch whose graceful tribute to genius did more to immortalise his royal memory than the Field of the Cloth of Gold and all the prodigal magnificence of a long, unlucky reign.

Michelangelo, like Lionardo, perceived at once the advantages to be derived from an association of art with anatomy. Realdo Colombo became his Marcantonio, and for twelve years, first in Florence then in Rome, he devoted himself to the study of the human body. The results are manifest, perhaps a little too plainly, in all his works. His statues of David, the Captives, and many others, are wonderful evidences of anatomical observation, and the preliminary models for his sculptures, in which the muscles were accurately built up in wax upon a framework of wire, attest the care he took to ensure accuracy. The nude figures in his "Cartoon of Pisa," or rather in the copy, which is all that is left to us, bear witness to the same comprehensive view of the truth that professed anatomists had still to seize; but the sculptor and painter gave nothing to medical science. The work of his friend Colombo appeared in 1559 without a single illustration beyond a woodcut frontispiece of a dissecting-room scene, and there is no record of any drawings by Michelangelo like those which Lionardo is said to have executed for Marcantonio. For artists the Florentine retaught the lesson impressed 2000 years before, and in even nobler style, by the sculptors of ancient Greece, that the most perfect ideal of beauty in art is attainable only by the most searching study of the real in nature.

The third great star of the Renaissance, Rafaelo Santi, again painter, sculptor, and architect, won triumphs as enduring as those which fell to the lot of his rival and contemporary, but they were of a somewhat different nature. He was perhaps less an anatomist than either Lionardo or Michelangelo, but fewer years were allotted to him for the consum-

mation of his studies, for he passed away before he had ended the fourth decade of his brilliant career. It is, nevertheless, proved by some of his sketches not only that he comprehended the importance of the science, but that he was no mean proficient in those portions of it which are most essential to the painter.

To this constellation may be added a fourth luminary, of smaller magnitude, in Rosso de' Rossi, a late contemporary of Rafael. He was the first artist who attempted to prepare a volume upon anatomy for the use of painters, but, unfortunately, he did not live to carry out his design. The one plate, containing representations of the bones and muscles, given to the world as an earnest of his good intentions, is, however, so rich in strength and fidelity that it has been mistaken for the work of Michelangelo himself. The original is extremely rare, but a reduced copy may be seen in Choulant's 'Geschichte und Bibliographie der anatomischen Abbildung' (1852).[1]

So far, the art of the fifteenth century bore little relation to medicine, if we omit from consideration the drawings said to have been made by Lionardo for Marcantonio; and the few illustrations that had appeared in the medical writings of the period might well have been spared. While the great painters left accurate record of all that their dissecting-room experiences had revealed, two of the most celebrated physicians of the age, Magnus Hundt, of Leipzig, and Lorenz Phryesen, of Colmar, found nothing better to illustrate their treatises than the anatomy of Galen; and Phryesen, in a portentous tome entitled 'Spiegel der Artzny' (1518), gives us only a wretched caricature of the skeleton, a view of the abdominal and thoracic viscera that was probably a reminiscence of some half-hearted autopsy of a dog or swine, one or two extremely confused sketches of the brain, and a carefully executed picture of the august teacher seated in academical dignity before a meek disciple, who cringes bare-headed to receive with unfathomable faith and patience the flatulent pedantry enunciated from the magisterial chair. It would be amusing, if not instructive, to

[1] This valuable book, together with the 'Graphische Incunabeln für Naturgeschichte und Medicin (1858),' by the same author, should be read by all who are interested in this subject.

quote the opening passages of the dialogue of question and answer as given by the author himself, but neither art nor medicine will justify the digression. History will not repeat itself; for even though a chastening Providence were to create another Phryesen, in what corner of our lecture rooms might we hope to find another such a pupil?

The first illustrated typographic volume upon practical medicine and surgery was the 'Fasciculus Medicinæ,' published in 1491, by Johannes de Ketham, an Italian physician. This contained some woodcut representations of visceral anatomy and surgical instruments, and the Italian translation, issued two years later, showed amongst other plates a view of a sick chamber with a man stricken by the plague, and an interesting dissecting-room scene. The book appears to have been very popular and ran through six editions between 1491 and 1522. Another early set of surgical engravings appeared in the 'Feldbuch der Wundarznei' of Hans von Gerssdorff, of Strassburg, published in 1517, to show woodcut figures of the skeleton and viscera, surgical instruments of various kinds, and the current methods of treating fractures and dislocations. It is nearly to the same date that we must assign the most ancient illustrations of 'Midwifery,' published by Röszlin, a physician of Wurm and Frankfort about 1513. I have not been able to see a copy of this work, but although the pictures are said to be fairly good, we may safely assume that none of the volumes of this time presented anything remarkable from the artistic point of view.

The *second period,* that of artistic illustration of anatomical, medical, and surgical works by wood engravings, began in the third decade of the sixteenth century with the appearance of a commentary upon the anatomical works of Mondino by Berengario da Carpi (1521), which was followed in the next year by a compendium by the latter author who therein corrected many of the errors of his predecessor and added much new material. Both of these books were embellished with woodcuts, a few of which, chiefly myological, were correctly drawn and of some artistic value, while others were of a traditional character and in accordance with the descriptions of Galen and the Arabian school. Nearly twenty years later further contributions of a very similar kind were

made by Johann Eichmann or Dryander, a professor at Marburg, who issued an original composition upon the dissection of the body in 1537, with wood engravings not unlike those of Berengario; and in 1541 an edition of Mondino, in which many of the illustrations executed for the previous volume were utilised for a second time.

Berengario and Eichmann did good service in the cause of anatomy and prepared the way for a higher school that was destined to relegate that of Mondino to the Araf of the imperfect sciences. Berengario had half caught the idea of a genuine treatise upon the anatomy of man, based upon direct investigation, but the consummation of such a work was reserved for a greater mind, that of the Belgian, Andreas Vesal.

The student of medicine of the present day who recognises the name of Vesalius only in association with an unimportant little foramen in the base of the skull, is scarcely aware that to his precocious genius we owe the entire scheme of human anatomy as a study involving precision of observation and description. Yet so it is, for to turn from the pages of his predecessors to the 'De Humani Corporis Fabrica' of Vesal, is to step from the confusing glimmer of conjecture and tradition into light and order. Much, indeed, is here left incomplete, but all is prepared for completion. And it is to be especially remarked that, from the first, the great teacher availed himself of the assistance of the painter and engraver, and not only selected artists of the highest capacity but superintended and directed their interpretations of the subject at every step. It is possible that he himself learned much in teaching his coadjutors, and it is certain that the value of his own labours was doubled by the aid derived from the skilled pencil which wrote his story in characters that all men understood: it was, indeed, by means of pictorial broad sheets—a form of publication that appears to have been very prevalent in the sixteenth century—that his work first become known, for six large plates engraved on wood after the drawings of a pupil of Titian named Johannes Stephen van Calcar appeared in 1538, in the form of "Fliegende Blätter," before the author had completed his twenty-fourth year

The *magnum opus* was published at Basle in 1543. To

men of science it was a revelation, as an example of anatomical research upon a scale unprecedented both in magnitude and minuteness; and to amateurs of art the volume has always been precious on account of the happy union of power and veracity in the designs, and the skill with which they have been transferred to wood by the unknown engraver. The drawings, with a few exceptions, display a remarkable power of conveying the essential features of the subject with the smallest amount of apparent labour: unlike many of the illustrations of later works, they never digress from the object they were intended to serve, and although a little artistic fancy appears in the attitudes and attributes of some of the full length figures, the cuts are for the most part as sober and practical as those which appear in the pages of Gray or Quain. In point of accuracy of detail there was considerable diversity in the various sections of the work. The most satisfactory presentments, as might have been conjectured, were those of the undissected body and of the bones and muscles: the nude forms which display the surface markings and proportions are striking, noble, and expressive, and leave nothing to be desired in correctness of outline; the skeletons and myological figures, inspired with life by the fancy of the artist, were freed from the repulsiveness of the charnel house without sacrifice of the essential truths revealed by the scalpel; but the drawings illustrative of the nervous system are amongst the least successful, although the dissector had prepared his material with skill and care. It is not indeed to be expected that many of the cuts would display the minute indications of detail that are looked for in even the least ambitious manual of our day, but the main features were faithfully described and portrayed, and the work as a whole was a triumph of learning, intelligence, patience, and artistic taste. It is difficult to say whether it was the illustrations or the text that exercised the stronger influence over the contemporaries and followers of the author, but for a century afterwards the anatomists of Europe did little more than compose variations upon the conjoint triumph of Vesal and Calcar. One other edition appeared before the death of the writer in 1564, but the artist did not live long enough to add to or correct any of the contributions he had made to the original issue.

A complete list of the works in which Vesal's illustrations were imitated would be too long to offer in this place, but a few deserve a passing allusion. The first systematic treatise upon anatomy in England was a compendium by Thomas Geminus in 1645, in which the designs of Calcar were translated upon copper-plates, losing nearly all their strength and beauty in the process. A smaller and later volume by John Banister, entitled 'The Historie of Man, Sucked from the Sappe of the most approved Anathomists and published for the Utilitie of all Godly Chirurgians within this Realme' (1578), borrowed a few woodcuts from the same source; the well-known 'Description of the Body of Man,' by Helkiah Crooke, published in 1616, had also sucked a good deal of its "sappe" from the great Vesalian tree of knowledge; and lastly, in France, the works of Ambroise Paré (1560) were illustrated largely by copies from Vesal, but included many other wood engravings of great interest for the student of the early history of surgery.

This digression has, however, led us away from a contemporary of Vesal, who must be regarded as an important and independent worker in the same field. In 1545, two years after the appearance of the '*De humani corporis fabrica*,' a French physician named Charles Estienne or Stephanus published a book descriptive of the dissection of the various parts of the human body, embellished with woodcuts of a curious character. The author, whose work was commenced before the appearance of that of Vesalius, was a practical and erudite anatomist, and would have made a far more conspicuous figure in the world of science, had he not been to some extent hidden within the gigantic shadow of his rival. As an anatomist, however, although an original worker, he was greatly inferior to Vesal, and he employed the assistance of art in a wholly different manner. In Vesalius the illustration, while of the highest quality, was always secondary to the subject of the text; but in Estienne's cuts the anatomy often appeared to be little more than a vehicle for the fanciful designs of the draughtsman. Some of the drawings were indeed rather striking as artistic compositions, and were not unskilfully engraved, but they included an exuberance of extra-anatomical detail and a misplaced affectation of sculpturesque

effect that often seem grotesque in their disproportion to the real object of the illustration. In one plate, for example, we see the entire form of a man standing in the foreground of a pastoral landscape, his calvaria hanging upon a withered branch above his head, while his denuded dura mater turned towards the spectator constitutes the square inch of anatomy in the quarto page of engraving. In another, a nude full length figure of a woman seated in a chamber of severely classical architecture, has no further object than to display the contours of the external genitals. In a third, a lady reposes in beatific slumber upon a mass of billowy cushions, undisturbed by a fearful gap in her abdominal wall that exposes what the artist conceived to represent the allantois. Nevertheless, the anatomy was for the most part fairly truthful, and it was evident that the author had carefully supervised the work of the engraver, for in many plates it may be seen that a portion of the block, probably where the first interpretation was unsatisfactory, has been cut out and replaced by a new and presumably a better rendering.[1]

The *third period*, extending from the middle of the sixteenth to the early part of the nineteenth century, may be termed that of artistic engraving on copper. It is, of course, well-known that chalcography had been practised long anterior to this time—at least, as early as 1461—and was employed with admirable effect by Mantegna before the end of the fifteenth century, but the few examples of the process that had appeared in medical books before the seventeenth century were of small artistic importance when compared with the contemporary work of the wood engraver, and it was not indeed until the eighteenth century that we were able to show more than two or three worthy specimens of a branch of art over which had been expended the genius of a hundred great masters of the brush and graver.

Amongst the first of the new series stands the 'Historia de la composicion del cuerpo humano,' by Joan Valverde de

[1] It has been supposed that, as the anatomical details in a few of these plates were confined to those portions of the block which had obviously been let in after the completion of the rest of the engraving, the woodcuts had originally been executed for a different purpose, and were merely adapted by Estienne. A careful examination of the series will, however, disprove this view.

Hamusco, a Spaniard, who had studied anatomy under Colombo and Eustachi. The illustrations to this work, attributed to a Spanish painter named Becerra, are mostly adaptations of the pictures of Vesalius, and are skilfully engraved on copper. One, however, is entirely new, and offers a curious instance of the tendency manifested by the old anatomical artists to make the most of the subject from their own point of view. It represents the figure of a man who, having just succeeded in divesting himself of his skin, stands in an attitude of dignified self approbation, grasping the bloody knife in one hand, and with the other holding up to view his detached integuments, from the midst of which the flaccid cortex of his face gazes in feeble deprecation at the spectator. Valverde's teacher, the Italian physician, Bartolomeo Eustachi, allowed his pupil to forestall him in publication. He, also, had many plates engraved to illustrate his anatomical writings, but only eight of these appeared during his life, in association with his 'Opuscula Anatomica' in 1564. Thirty-nine other engravings, executed under his directions not later than 1552, remained unutilised until forty years after his death, when they were at length published by Lancisi, together with the original descriptions, under the title of 'Tabulæ Anatomicæ Bart. Eustachii' (1714). Despite their prolonged repose in the Sleepy Hollow of the lumber rooms of Eustachi's unappreciative heirs, the pictures were so little behind the age when they were introduced to the world that edition after edition was called for, the demand ceasing only at the beginning of the present century. The representations were indeed richer and more trustworthy in detail than any that had gone before, and although both drawing and engraving were excessively feeble and unattractive, the scientific spirit of the plates was more than sufficient to compensate for their æsthetic defects.

The use of wood engraving in the reproduction of anatomical and surgical works did not end during this latter half of the sixteenth century, or afterwards, but it ceased to hold an important place in the illustration of the more ambitious works of our professional ancestors. Many writings, however, of great value, such as the contribution of Constantio Varoli to the anatomy of the brain ('De Nervis Opticis,' &c.,

1573); the 'Historia plerarumque partium humani corporis' (1585) of Salomon Alberti; and the artistic treatise 'Varia Commensuracion para la Escultura y Arquitectura' (1585) of Juan de Arphe; but the power that stamped the cuts in Vesal had vanished.

In the seventeenth century copper-plate engravings held undisputed sway. The anatomical works of Giulio Casserio (1627), and those of his successor in the chair of Padua, Adrian van der Spieghel (Spigelius), were abundantly and artistically illustrated by this process, after the designs of Fialetti, a pupil of Cremonini and Robusti. Another precious set of drawings were made a little later by the famous painter Pietro Berrettini or Pietro da Cortona, for the anatomist Johannes Maria Castellanus, and skilfully transferred to copper; but these plates, like those of Eustachi, were allowed to remain buried, and it was not until a century later—in 1741—that they were discovered and published; a lapse that was the more to be regretted on account of the spirit and accuracy of the representations. In the sketches of Fialetti and Berrettini, as in most instances where painters have interested themselves to work for the anatomist, the grimness of the motive disappears under an artistic glamour of vitality, or even of humour. In the presentment of the pregnant uterus in the 'De Formato Fœtu' of Spigelius, the "subject" is no dissecting-room corpse, as in Hunter's plates, but a lady of elegant proportions and self-possessed bearing, who stands apparently in animated conversation, naked and unashamed in the publicity of a broad campaign; and neurology is demonstrated by Berrettini, in the figure of a man in an advanced stage of dissection, who with an air of refined courtesy holds aside his sternum to facilitate the inspection of the course of his right pneumogastric, while extending in graceful gesture an arm from which the muscles, cut from their attachments, swing by the supplying branches of their nerves in helpless shreds about him.

A noteworthy feature of the same period was the invention of dissected plates of anatomy, in which the various structures of the body were displayed as far as possible in their natural interrelations by means of overlapping segments of paper, each bearing the outlines of a portion of the surface, or of an

organ or set of organs, and so attached that it might be reflected in the natural order of superposition of the parts represented. The idea seems to have emanated from Johann Remmelin, of Ulm, whose tables first appeared, without his permission, in 1613, under the title of 'Catoptrum Microcosmicum.' The plan was not without merits, and has been utilised with various modifications by many authors of later times, but the pictures have generally been lacking in originality and artistic interest. Those of Remmelin offered nothing remarkable in this respect, but his book is of value to the curious on account of the ingenious way in which the draughtsman has taken advantage of the method to impart a metaphorical flavour to the scientific details of his designs by masking the female genitals by a warning apron representing the ghastly face and viper locks of a gorgon; and preparing the way for the exposure of the womb by a veil of smoke and flame, pregnant with new life, arising from the ashes of an expiring phœnix.

The great landmark of progress in the yet somewhat sterile region of medical science, the immortal 'Exercitatio Anatomica de Motu Cordis et Sanguinis' of Harvey, was printed in 1628, but the work owed nothing to the quality of the copper-plates which illustrate it, nor did English art appear to advantage in any of the medical publications of the seventeenth century. John Woodall's 'Military and Domestic Surgery' (1641), although a very fair record of the surgical practice of the time, was scarcely adorned by the rough copper cuts of instruments with which it was illustrated, and the 'Opera Omnia' of Willis (1676) was no more worthily embellished. The plates in Samuel Collins' 'System of Anatomy' (1685), executed by Faithorne, were of a much higher character, but displayed less excellence than might have been expected from so able an engraver; and those of a nearly contemporary treatise upon the muscular system, by John Browne, a surgeon to St. Thomas's Hospital, have still smaller claims to our admiration. The pictures in the latter case were, however, interesting from the fact that the names of the muscles were engraved upon the parts (a practice which was revived in modern English text-books by Mr. Luther Holden); but the dissected figures, drawn with pretentious badness, are placed

in the most curiously affected and self-conscious attitudes, as though they were proud of the parade of their anatomical details, and even the claim of originality is wanting, since many are obviously imitated from the earlier and better illustrations of Casserius. The work, however, ran through four editions, so that it must be supposed to have possessed qualities of more importance than those of mere attractiveness.

The palm of artistic excellence in the medical books of the seventeenth century belongs to Holland. The 'Anatomia humani Corporis' of Godfridus Bidloo, professor of anatomy at the Hague and Leyden, and at one time physician to William III of England, did not add largely to science, but the author took the judicious step of securing the services of the painter Gerard de Lairesse and an engraver (A. Blooteling ?) of almost equal talent, and to the present day his book has remained greatly prized if little read. Many of the plates, although of astonishing vigour, are unfortunately too naturalistic both for art and science, but the man who was usually almost Zolaesque in his superfluous realism could not always resist the temptation to pictorial allegory. Two of his osteological designs are especially remarkable as works of art: in one of these, a figure standing within the entrance of a sepulchre, magnificent even in its fleshlessness, holds up an hour-glass as though to warn us that our state was separated from his only by the moments of passage of a few falling grains of sand; and in the other, the animated skeleton is seen retiring into the grave, not without a certain grace and dignity, to escape a world where the stern simplicity of the unclothed bones could find neither sympathy nor repose. These plates were pirated some years later by an English surgeon, William Cowper, to illustrate a work of his own.

Before leaving the seventeenth century it may be noticed that two of the greatest painters of that period, Rembrandt and Rubens, have left their mark in connection with medical science; Rembrandt in his celebrated picture of the physician Van Tulp demonstrating the muscles of the arm in the anatomical theatre of Amsterdam (painted 1632), and Rubens by some bold and characteristic sketches of the superficial forms of anatomy, one of which has been rather ill reproduced on copper in the 'Myotomia Reformata' of William Cowper.

The next century, the eighteenth, was an auspicious one for European medicine. It is true that it gave us no successor to Harvey, but the senseless opposition to his discoveries which embittered the later days of the great physiologist and disgusted him with his fellow-men became ridiculous, and at last extinct. It was now that an aphorism of Hippocrates could no longer suffice to sanctify medical manslaughter, and it was now that a galaxy of thinkers and workers were replacing empiricism and tradition by experiment and observation. But the scientific advance did not yet bring with it any greatly increased demand for the aid of art, and, as before, nearly all that could be looked upon with gratification in the pictorial illustration of medical literature was attached to the single branch of anatomy. The illustrations to books on surgery or pathology were scanty and were rarely satisfactory, either from the artistic or scientific aspect. Practical medicine had developed few of the features that were to render the teacher grateful for drawings or diagrams to impress the necessary facts of pathology and diagnosis, and midwifery has scarcely attained a position as a specialty. There was, however, no lack of splendid anatomical folios, printed in the most sumptuous style, and embellished with costly plates and exquisitely engraved vignettes and *culs de lampe*. How a sufficiency of purchasers could be found for such princely volumes it is hard to say, for the medical profession was not rich, and even the burin of Van der Gucht, of Wander Laar, and of Strange, and the harmonious colour painting of Ladmiral and Gautier, could scarcely attract the outside world when employed to depict the trochanters or condyles of a femur, the layers of muscle clinging to a half-denuded skeleton, or the fœtus curled up within the ripped and gaping womb; yet it is certain that the subscription list was a very substantial one.

Practically, there was but a single method of reproduction during the period comprising the eighteenth and the first twenty years of the present century, and that an expensive one, etching on copper; for the wood block had fallen from its high estate and gave us no more pictures like those of Calcar.

The list of notable volumes is too large even for enumeration, but we may select as specimens for beauty of illustration,

the 'Osteographia, or Anatomy of the Bones,' by William Cheselden, of St. Thomas's Hospital (1733), the 'Tabulæ sceleti et musculorum corporis humani' of Bernhard Siegfried Albinus, of Leyden (1747), and the 'Anatomia uteri humani gravidi,' by William Hunter (1774). Cheselden's work, although perhaps unsuitable for the modern student of osteology, was a monument of pictorial accuracy for its time, and placed side by side with later essays in the same direction such as the 'Tabulæ ossium humanorum' of Albinus (1784), and the osteological section of John Bell's 'Anatomy of the Bones, Joints, and Muscles' (1810), is superior beyond comparison. It includes, moreover, besides the representation of typical human osteology, some characteristic examples of bone diseases and a number of beautifully etched representations of skeletons of the lower animals. The author, a man of cultivated taste, like his equally famous colleague Dr. Mead, spared neither trouble nor expense to secure the most artistic reproduction of his preparations, but he was above all a man of science, and as he did not care to risk any sacrifice of accuracy by trusting to the unaided eye of the draughtsman, he had each specimen drawn under the camera obscura. The result, as may be seen, lost nothing in truth or vigour, and the 'Osteographia' is a volume we are proud to number amongst the medical literature of our country. The way had been prepared for this large work by the modest octavo, entitled 'The Anatomy of the Human Body,' first published in 1713, and which, like its successor, included morbid as well as normal anatomy. It was necessarily a mere outline, but it contained much that was of interest, and the plates, engraved by Gerard Van der Gucht from drawings made with the assistance of the camera, were novel and attractive. Two of the number, a skull and a myological rendering of a sculpture representing the struggle of Hercules and Antæus, may be regarded as good examples of the style.

The atlas of Albinus was a more important though in some respects less artistic work than that of Cheselden. Myology had been well and broadly treated in the illustrations to many older volumes, but the minutiæ of form, origins, and insertions of each individual muscle were here represented for

the first time, and the task was accomplished with so much thoroughness that little has remained for us to add. The drawings of the various figures display great skill and greater accuracy, and although the engraver has injured the effectiveness of the design by a mechanical hardness of style and an inability to reproduce the textural character of the structures, he was able to preserve so well the essential truths that the noble atlas fully merits the rank it held during three generations as a standard of reference both for the artist and for the surgeon, and of the flattery of imitation that led to the incessant repetition of the plates upon almost every scale up to that of nature throughout the course of the next seventy or eighty years. It was not until near the middle of the present century that its place was taken by other works more suitable to the requirements and pocket of the student. The illustrated volumes issued by the same author, devoted to the bones and the gravid uterus, are of less importance and were surpassed, the one by Hunter, the other by Cheselden.

William Hunter's treatise on the 'Gravid Uterus' may rank with Cheselden's 'Osteography' as an ornament to the library, for the best art available at the time had been lavished over a subject that would appear little susceptible of æsthetic treatment. The foremost engravers of the day were employed upon the plates, and one of the number, the famous Sir Robert Strange, is said, in John Hunter's preface to the treatise, to have given "his advice and assistance in every part of the work with a steady and disinterested friendship." It is doubtful, however, whether the illustrations are to be preferred to those dealing with the same motives in Bidloo's 'Anatomy.'

After these volumes may be named another of corresponding dimensions, the 'Myotomia Reformata' of William Cowper. This writer, it may be remembered, was convicted of acting somewhat discreditably in the annexation of Bidloo's plates, but the engravings in the 'Myotomia' were undoubtedly original. They were designed with moderate correctness and the execution was in good style, but the existence of the Atlas of Albinus deprives them of every *raison d'être* except, perhaps, that conferred by the quaintness of the initials, head-pieces, and *culs de lampe*. Other examples of anatomical plates em-

braced within the same period were those illustrating the 'Observationes Anatomicæ' of Santorini (1724); the 'Demonstrationum Anatomico-pathologicarum (1760), by Peter Camper, of Leyden, who was an accomplished artist as well as an anatomist and physician; Mascagni's useful but not very pleasing pictures in his 'History of the Lymphatics' (1787) and in his posthumous 'Anatomia per uso degli studiosi di Scultura e pittura' (1816); those of J. J. Sue, illustrating a translation of Monro's 'Anatomy of the Bones' ('Traité d'Osteologie,' 1759), and his own 'Elemens d'Anatomie a l'usage des peintres, des sculpteurs, et des amateurs;' Van Soemmerring's 'Tabula Sceleti feminini' (1797); Caldani's 'Icones Anatomicæ' (1801-13); the bold but coarse, and not very exact engravings of the 'Bones, Muscles and Joints' by John Bell (1810); and the less inelegant but still unsatisfactory etchings of Sir Charles Bell, published between 1816 and 1833. In conclusion, we may refer to the hideous anatomical plates of Lizars as works suitable to mortify the flesh after vainglorious rejoicing in the splendour of the embellishments bequeathed to us by Cheselden and Hunter.

The application to medical and anatomical purposes of printing in colours from engraved copper-plates was originated by Le Blon as early as 1721, and further developed by Jan Ladmiral about 1736, and by J. F. Gautier d'Agoty and his son between 1745 and 1773. The process is well exemplified in Ladmiral's plates of the male genitals, and in Gautier's illustrations to Duverney's 'Description of the Muscles' (1745) One of the latest specimens of the method may be found in Travers' treatise upon 'Diseases of the Eye' (1811). Alibert's 'Lectures upon Diseases of the Skin,' which appeared in 1814, were also illustrated by chalcographic plates printed in colours, but these were engraved in a different and far less forcible style.

The *fourth* and latest *period* may be dated from the close of the second decade of the present century. Medicine had long since outgrown the narrow limits prescribed by the jealous ignorance of many of its early votaries, and the labours of men like Vesal, Harvey, Paré, Hunter, Mascagni, and Bell, had laid the foundations of a mighty edifice, but it was reserved for the multiplied workers of more recent years to develop the great pile that now rises around us with such

incredible swiftness. Where its growth must end it is not easy to say. In some of its parts the task appears to have approached completion, in others the new additions, abundant as they are, fall into speedy dilapidation; much that once seemed sure and solid is found to crumble into dust under the light of new researches; here and there advance is opposed by petty obstruction or endangered by scamped or dishonest work, but the general law is one of ceaseless growth associated with an ever increasing subdivision of labour. To assist in the great work almost every department of science has been laid under contribution, and the stout yeoman service rendered by art is by no means the least important of the motive forces now at work.

Art has become more and more indispensable to us as an aid both to record and to explication. The diagram, the more highly-finished drawing, the photograph, and the model, serve as a new language that speaks with strength and clearness where written or spoken words would convey their meaning slowly and imperfectly. The new period has been characterised by an immense quantitative augmentation of illustrations to medical literature, by the increasing preference shown for diagrammatic clearness over artistic effect in the rendering of anatomical and pathological detail, and by the multiplication of methods of pictorial reproduction. We have no Lionardo da Vinci, Calcar, Fialletti, or Berrettini, but the modern draughtsman makes up in comprehension of the needs of science all that he lacks in artistic genius. We can boast no engravings as effective as those of the broadsheets of Vesal, or even of the plates of Bidloo and Cheselden, but we are able to employ new processes that reproduce the drawing or the original object without error of interpretation, and others that give us very useful effects of colour at small expense. Our art is less picturesque, but more serviceable and more easy of access.

Engraving on copper, which occupied so important a place during the last period yielded to cheaper and more readily adaptable processes, but a few specimens of chalcography appeared even as late as the middle of the century. The steel plate, as modified by Warren in 1818, served for works in which delicacy of line was more particularly sought,

but the result was not satisfactory. Wood engraving, which had fallen into decay, was revived by the teaching of Thomas Bewick and placed once more in the forefront amongst the resources of the book illustrator. The colour printing of Le Blon, Ladmiral, and the Gautiers yielded to chromolithography and afterwards to chromoxylography. Lithography, invented about 1796, was destined to hold an important place in medical illustration. Photography and photographic processes of engraving were found of value where an exact transcript from nature or from a drawing was especially desirable. Finally, drawing and painting served as before to illustrate papers and reports of cases when immediate multiplication of the design was unnecessary or impracticable; and hand-colouring was employed to lend character to pictures engraved by the ordinary processes.

The first important medical essay in lithography appears to have been the engraved plates of the 'Arteries,' published by Tiedemann in 1822, but the result here was by no means striking. It was not long afterwards, however—in 1831—that the large work of Bourgery, illustrated by Jacob, the father of the modern French school of anatomical drawing, threw a new light upon the possibilities of engraving on stone. The somewhat less vigorous but more accurate plates executed by J. B. Leveillé, Jacob's favourite pupil, for Fau's 'Anatomie des formes exterieures du corps humain' (1845), and the nearly contemporary drawings of the bones, ligaments, and muscles for Bonamy by Emile Beau (1844), fully maintained the reputation of the new manner; but the highest point of excellence was reached in Leveillé's designs for Hirschfeldt's 'Anatomie du Système Nerveux' (1853), which has placed France beyond rivalry in anatomical illustration. In this country many good examples of the same method of reproduction have seen the light; some by professed draughtsmen like Ford, and others by such distinguished members of our own profession as Maclise, Marshall, Holden, and Godlee.

A lithographic process which secures all the effect of a delicate engraving in steel has been largely utilised for histological drawings, particularly in the 'Transactions' of the various medical societies and elsewhere, and with great success. Mr. Treves' illustrations to his work on 'Tubercle,' and those

of Mr. Harrison Cripps in his contributions to the Pathology of the Rectum, may be especially referred to in exemplification. Engraving on steel as applied to medical pictures cannot be regarded as successful even where the preliminary drawings have been supplied by highly competent hands: the best specimens are perhaps to be found in Bernard and Huette's 'Chirurgie Operatoire,' in the anatomical works of Beraud, Rudinger, and Anger, and in Heath's 'Operative Surgery.'

In wood engraving, despite the great development of the process during and since the time of Bewick, there is little that we can show with gratification. As in the case of etching on steel, the work of the artist is usually translated in a more or less ignorant style by the engraver before it is presented to the public, but one remarkable exception should be pointed out. The cuts by William Bagge, after the drawings of his brother, which appear in Wilson's 'Anatomist's Vade Mecum,' Fergusson's 'Operative Surgery,' and other volumes, are triumphs of veracious expression and artistic feeling; but here the engraver knew his subject. Some of the cuts by Salle in Sappey's 'Anatomy' may be noticed on account of their great delicacy of execution, but are distinctly inferior in other respects to the works of Bagge; the illustrations to Neumann's 'Hautkrankheiten' deserve remark, as good applications of the process to histological design; and lastly, the correct and graceful drawing of Cuthbert in Marshall's 'Anatomy for Artists' has been skilfully transferred to the block by Nichols. As a rule, however, the woodcuts illustrating medical books do not deserve a large amount of credit for artistic beauty or scrupulous accuracy. A few rise above the level of average excellence, more fall below it, and it is not pleasant to confess that the lowest depths of badness seem to have been reached in two or three works published within the last few years in our own country.

Chromoxylography, a process of respectable antiquity, has been applied to medical illustration only within the last few years, chiefly for the purpose of accentuating the course of vessels in anatomical text-books, but a higher promise is indicated by the pleasing and expressive cuts in Syme and Woodhead's 'Practical Pathology' (1884), Merkel's 'Topographische Anatomie' (1885), and a few other recent works.

Photogravure has been successfully employed in Mac Cormac's 'Notes of an Ambulance Surgeon,' and more recently in plates of cerebral topography and other works, and it is certain that before long the numerous modifications of photographic reproduction are likely to take a very important place in the illustration of medical literature, on account both of their cheapness and their unerring though unselective exactness.

Glyptic art as applied to artistic anatomy probably dates from the time when Michelangelo commenced the plan of moulding on a small scale in wax the muscular forms of figures which he proposed to execute in marble. Becerra, the painter who illustrated Valverde's book on Anatomy, is said to have made the first anatomical figure in plaster for the use of artists. Fischer, a professor of anatomy to the Academy of Sculpture in Vienna, near the end of the last century, was the author of a striking model constructed for the same purpose; and more recently two or three other examples, which may be seen in most of our schools of art, have been provided as a guide for students of drawing.

Sculpture as adapted to the illustration of medical anatomy is of greater antiquity. The figure found in Rome in the villa of a physician to the Emperor Augustus, has been already mentioned, and wood carvings of a similar nature having long been employed both in China and Japan. The more accurate specimens, however, are of recent date. One of these, still in use, is a complicated life-size model in plaster, made in Paris, which can be taken to pieces in such a manner as to demonstrate more or less correctly the form and relation of nearly every part of the body; but the idea has been brought into service in a far more scientific manner by Professor His, who, by taking casts of organs that have been frozen *in situ*, has given us a means of studying the topography of the viscera far superior to anything before at our disposal. The use of plaster casts of pathological specimens needs only be mentioned in passing.

Models in wax *à la Tussaud* have been in use for many years, and much artistic talent has been employed in conferring upon them a realistic character, which has sometimes been

greatly abused in the interests of quack "Museum" proprietors. For purposes of anatomical teaching they are falling into disuse, but they still supply a want in pathological reproduction. Surgery has sought the aid of glyptic art to furnish artificial substitutes for parts of the body that have been lost by accident or disease. A very early example of Roman origin has lately been added to the museum of the Royal College of Surgeons in a beautifully modelled bronze leg made to replace a limb that had perhaps been sacrificed in warfare. The manufacture of false teeth, a very ancient branch of industry, has now assumed gigantic proportions, and we may, further, in the present day purchase with trifling outlay compensation for ravages still more destructive of beauty, in the form of factitious noses sculptured with the skill of a Praxiteles, and limpid eye "scales" that seem capable of expressing all the emotions of the soul.

The utility to the physician or surgeon of a share of artistic capacity requires little demonstration. The minute analysis of form demanded by every honest attempt at portraiture brings with it a training of eye that may prove of no small value in diagnosis and in operative treatment. The physician or surgeon recording the signs of disease may furnish himself with pictorial notes that will prove an invaluable supplement to his literary memoranda; and the teacher will often times find himself able to flash an idea by the magic strokes of a piece of chalk upon a black board when the most eloquent sentences have failed to kindle the spark of comprehension in his audience. For this it is not necessary that the practitioner should be an "artist" in the sense in which the term is employed by the connoisseur: a simple knowledge of the rudiments of drawing, with such powers of imitation as are latent or evident in most of us, will be sufficient for ordinary purposes. Although Marcantonio and Vesal, over three hundred years ago, were fortunate enough to secure the aid of men like Lionardo da Vinci and Stephen van Calcar, art of so high an order of excellence is now a luxury that we cannot hope to engage in the service of medicine; but, fortunately, we may console ourselves by the assurance that we do not

require it. As admirers of the beautiful we must satisfy our aspirations outside the sphere of our profession and we can do this with a facility unknown to our forefathers, but as physicians and surgeons, physiologists and pathologists, our desiderata in artistic reproduction are qualities of lucidity and truth of detail that appertain less to pictorial genius than to scientific intelligence. The more of æsthetic charm we can add without prejudice to essentials the better, but it will often occur that the features of an object which possess the greatest significance for men of science are precisely those which the painter might be inclined to disregard on principle, while, on the other hand, an amateur of fair artistic ability, working at his subject with the eye of the understanding, may provide us with a more useful presentation of anatomical or pathological facts than we could hope to gain from the pencil of a Botticelli. In view of this truth there can be no doubt that the establishment of special classes of "professional" drawing in our leading schools of medicine would confer an advantage of no small importance upon the progress of our craft, for until we take steps to educe and develop the artistic talent that exists within our own ranks our writers must inevitably be condemned to loss of time and patience in the attempt to secure truthful and presentable drawings for their publications, and the eyes of the reader will be offended or his understanding perplexed with ugly or inaccurate pictorial misrepresentations that only serve to deface the page or obscure the text. If this were carried into effect, the maker of books need go no farther than his class or school to find competent and educated draughtsmen; and the more highly gifted pupils would have acquired an accomplishment that might not only conduce to their usefulness, reputation, and profit, but add in no small degree to their capacity for wholesome enjoyment.

I may, in conclusion, venture to offer a few words with reference to the relations of the medical profession to art. There is perhaps no calling in which the average of general culture has been higher than in that to which we have the privilege to belong. It has given to science some of its most brilliant

lights, it includes many names famous in letters, and although its share in art is less prominent it has been neither small nor uninfluential. We have numbered in the past men like Camper, John and Charles Bell, Solly, and Joseph Maclise, who have left enduring marks of their pictorial skill, and we have still working in our midst some active and noteworthy contributors by pen and pencil to general art, as well as others who have devoted remarkable powers of draughtsmanship to the instruction of the junior members of their own profession. Nor is this all. It has been truly remarked by one who is in the best possible position to speak with authority on the point, that "almost every medical man of ordinary intelligence who achieves a fair share of success in his profession becomes a fine art collector of some sort, and has a hobby which, when you know him, and not until then, you are perhaps astonished to discover. . . . So surely as you find a successful doctor so certainly will you find an art treasure of some kind somewhere about his dwelling. If you haven't found it, you don't yet know your man."[1] Were we to attempt to enumerate those of our brethren who have made their homes beautiful by rare and well-selected works of art, the list of names would be almost as formidable as a 'Court Guide,' but there are some who have gone far beyond this modest use of taste and wealth, and have brought together collections that are well known and valued in the world of art. Belonging to the past are Dr. Mead, Mr. Joseph Henry Green, Dr. Sibson, and Mr. Shadford Walker, and in the present there are many more whose names are so far household words among us that I need not assume to myself the office of recorder. To one of this number, my friend and colleague Dr. J. F. Payne, I must dedicate my closing words in grateful acknowledgment of the generosity with which, in the course of the task I now bring to a termination, he has permitted me to take advantage of his library and learning to a degree only justifiable by the wide extent of both.

[1] 'Charley Kingston's Aunt,' by "Pen Oliver," Chapter viii.

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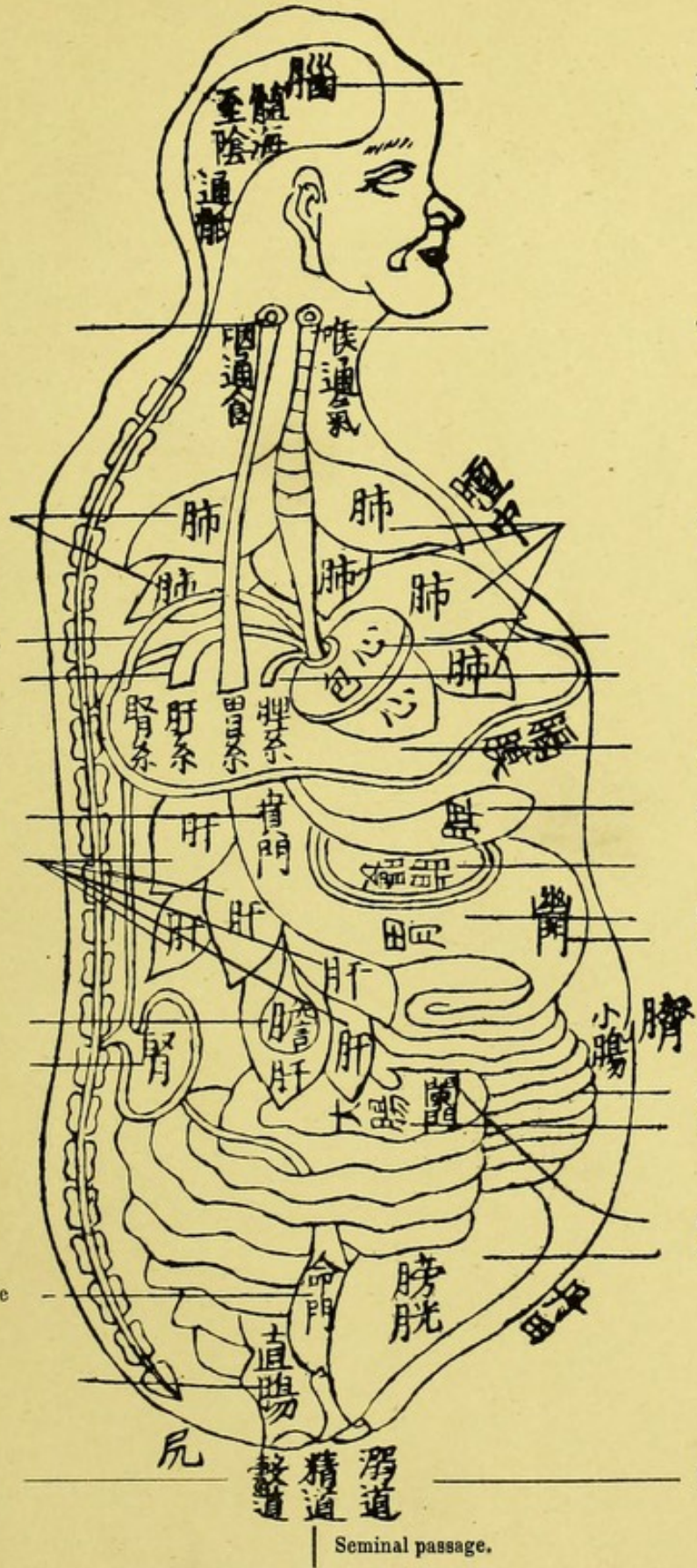
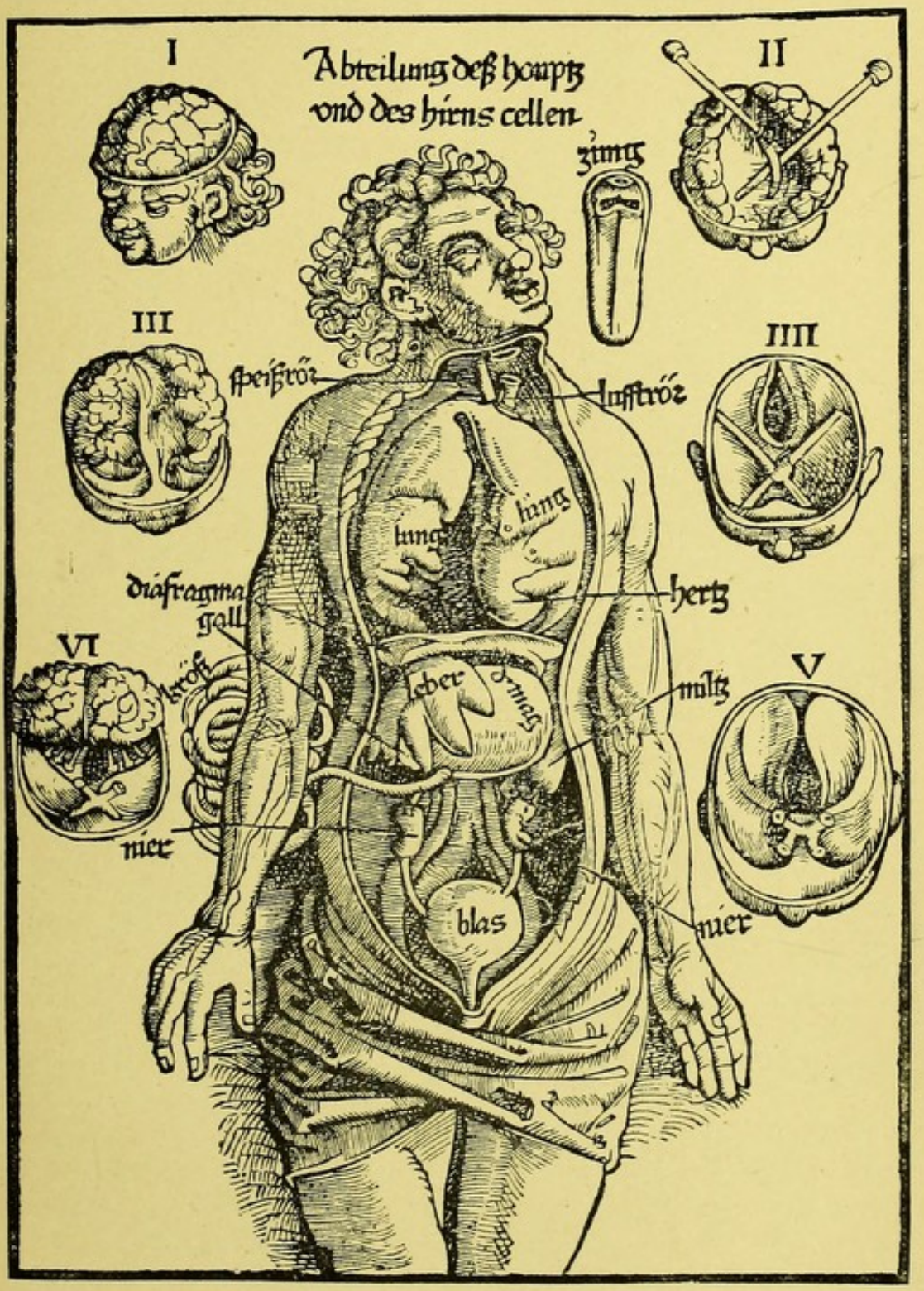
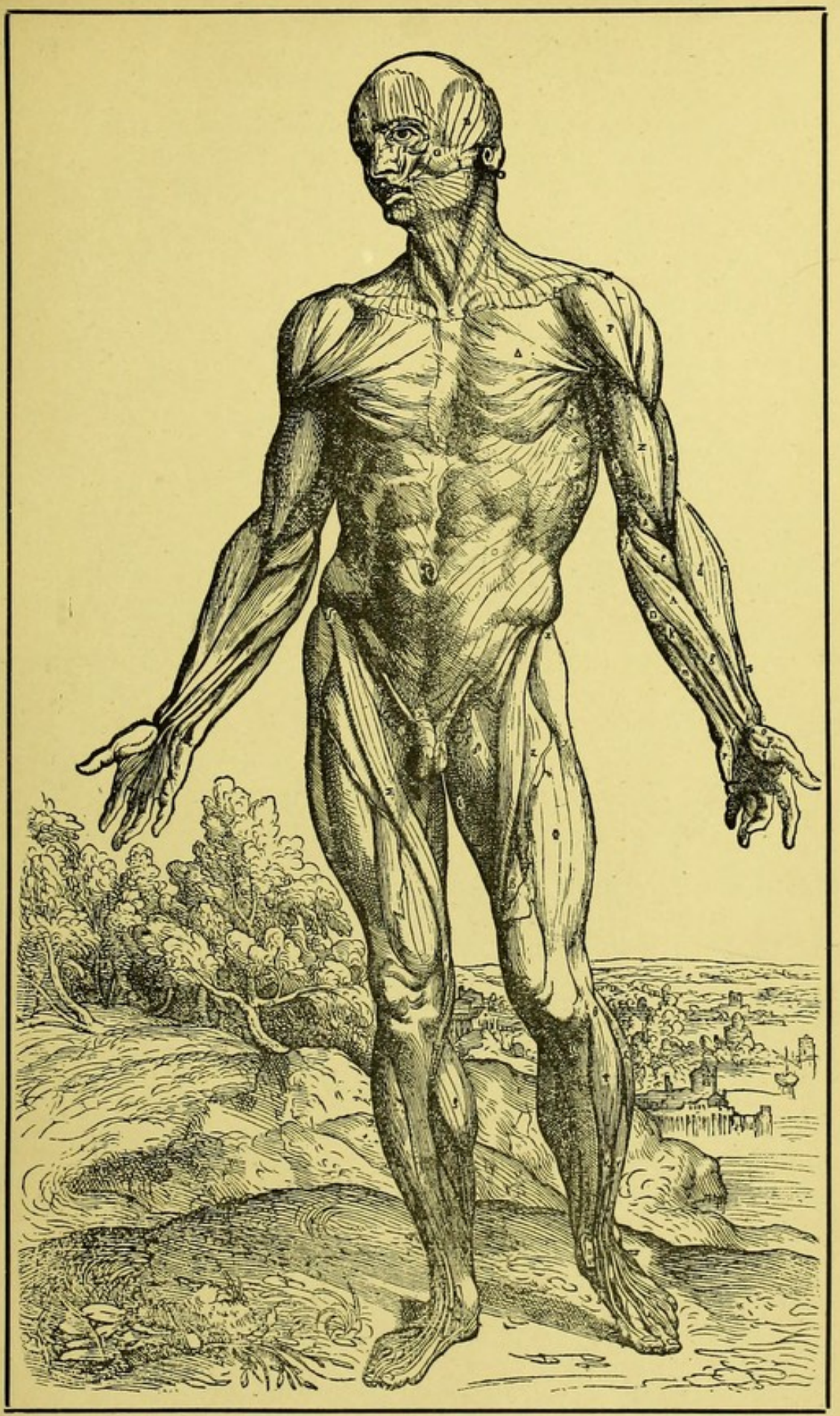


CHINESE ANATOMY. From the *Kimmó dzu-i* (Japan, 1685).

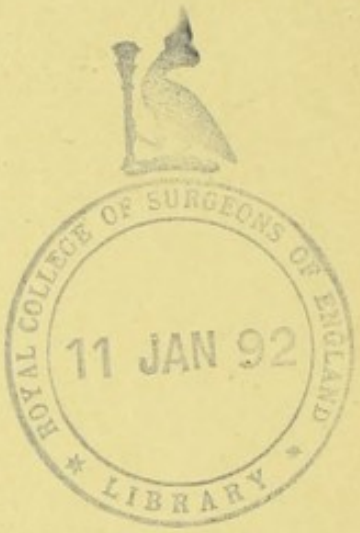


From the *Spiegel der Artzny*, by Laurentius Phryesen or Frisen. Strassburg, 1518. Fol. min.

Dr. J. F. Payne's Collection.



From the *De humani corporis fabrica*, by Andreas Vesal. Basle, 1543. Fol. max.
Dr. J. F. Payne's Collection.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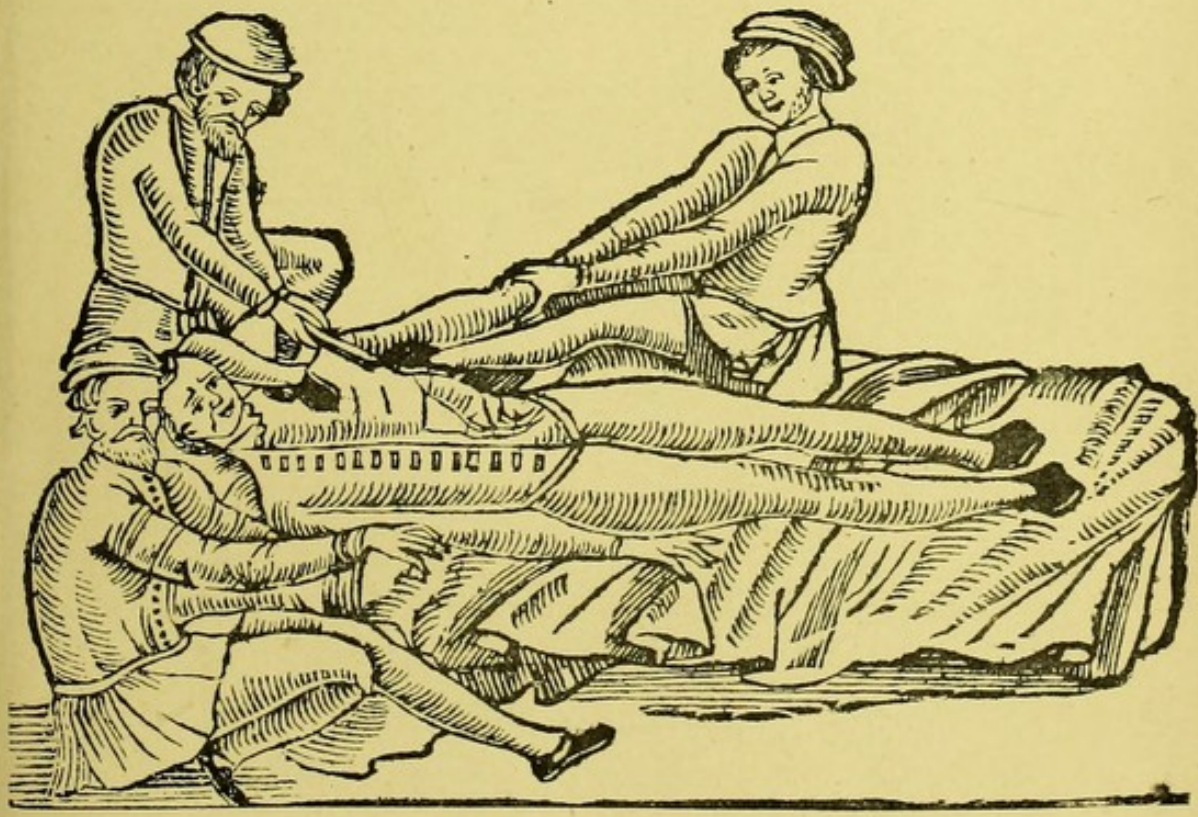
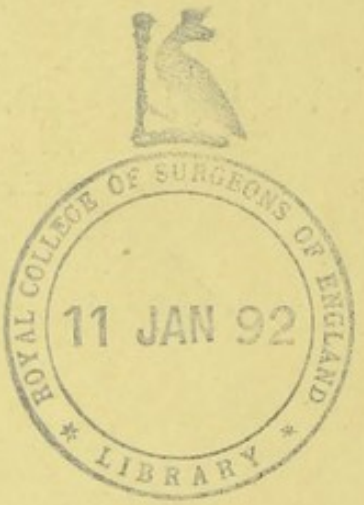
ANDREAS VESAL. From the *De humani corporis fabrica.*



From *Œuvres d'Ambroise Paré.* Paris, 1561. Fol.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From the *De dissectione partium Corporis*, by Charles Estienne (Carolus Stephanus). Paris, 1545. Fol. min.

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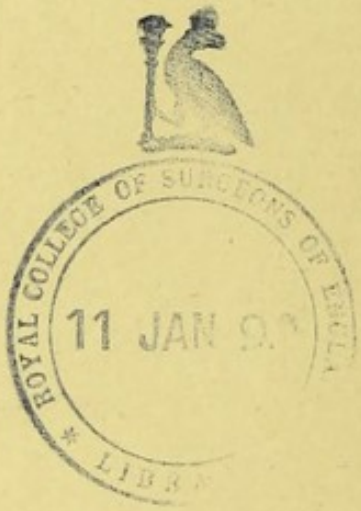
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From the frontispiece to the *De re Anatomica*, by Matteo Realdo Colombo. Venice, 1559. Fol.

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From the *Tabulæ Anatomicæ*, by Giulio Casserio. Venice, 1627. Fol.
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From the *Myographia*, by John Browne. London, 1684. Fol.

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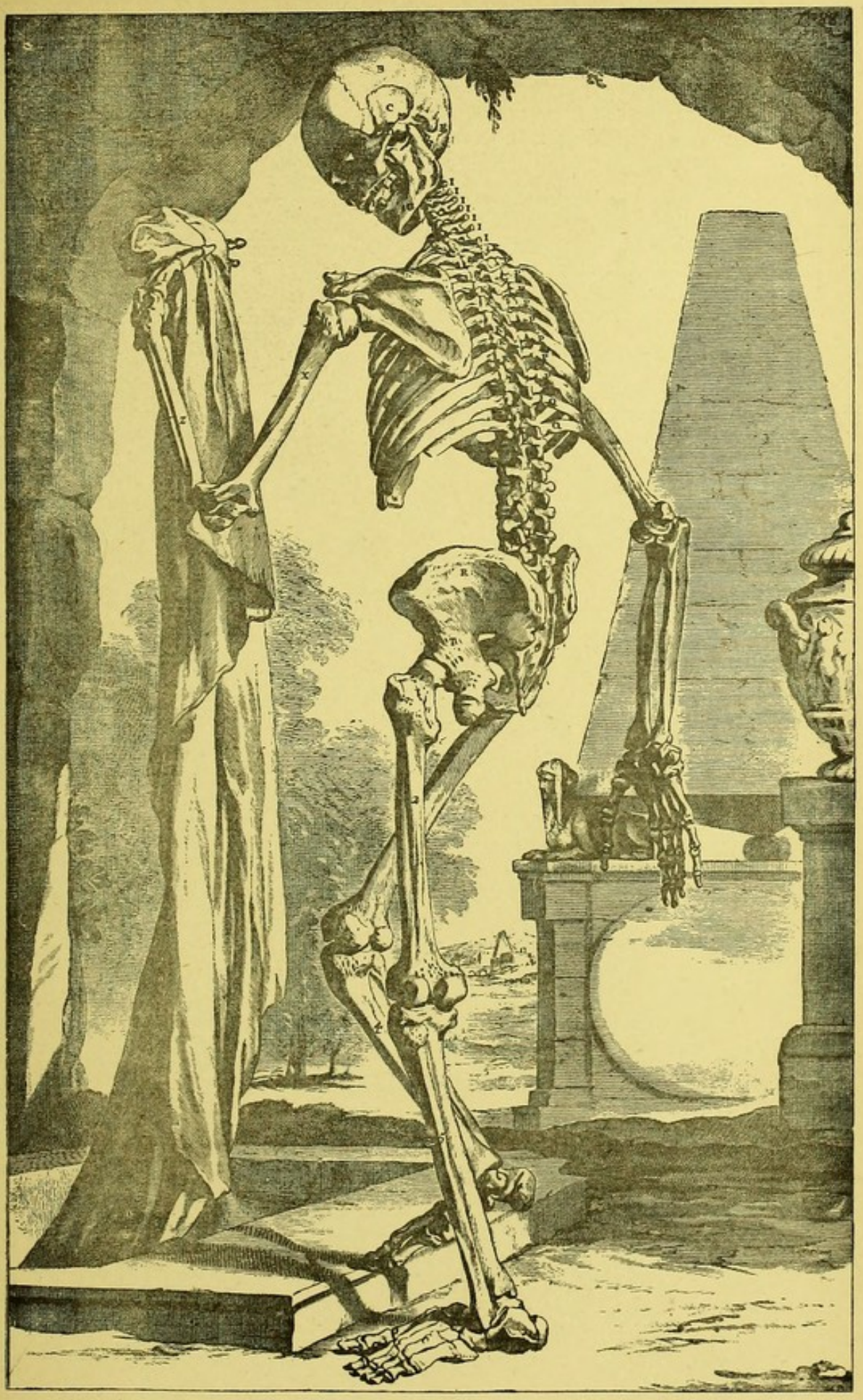
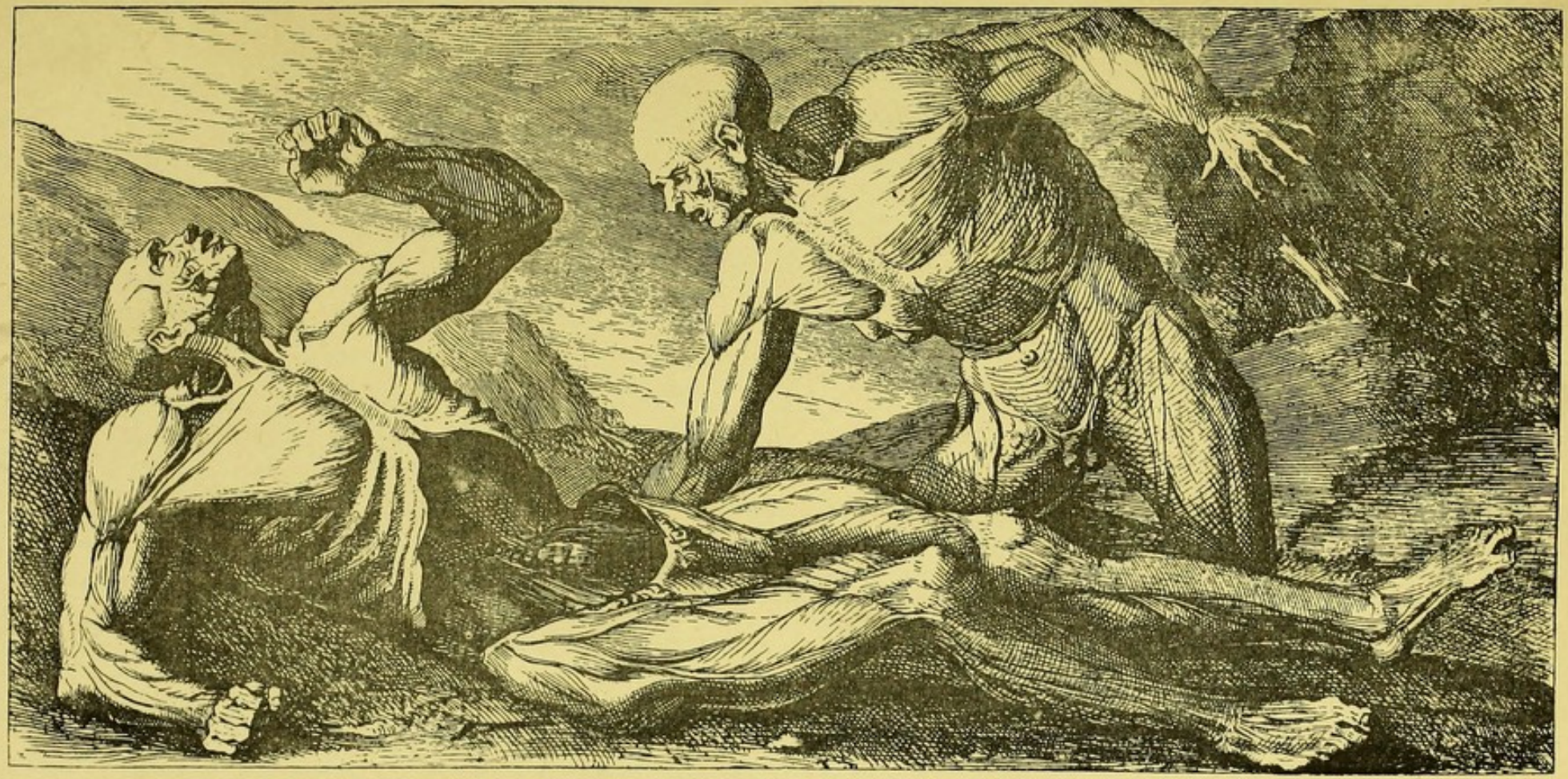
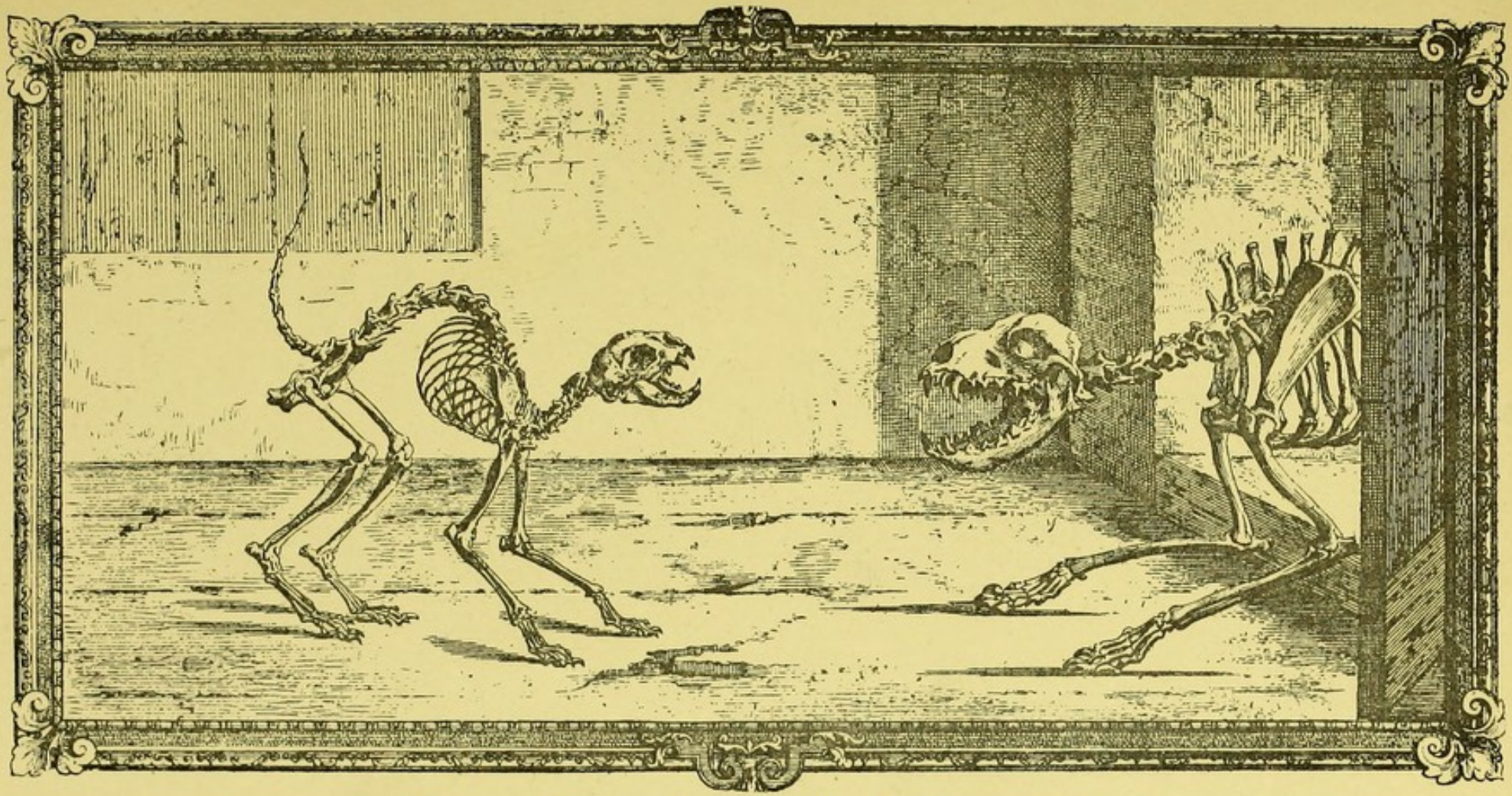


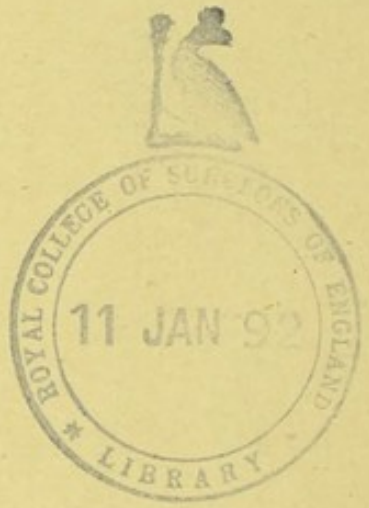
From the *Anatomia humani Corporis*, by Godefridus Bidloo. Amsterdam, 1685. Fol. max.



VIGNETTE. From the *Myotomia Reformata*, by William Cowper. London, 1724. Fol. max.



From the *Osteographia*, by William Cheselden. London, 1733. Fol. max.
Dr. J. F. Payne's Collection.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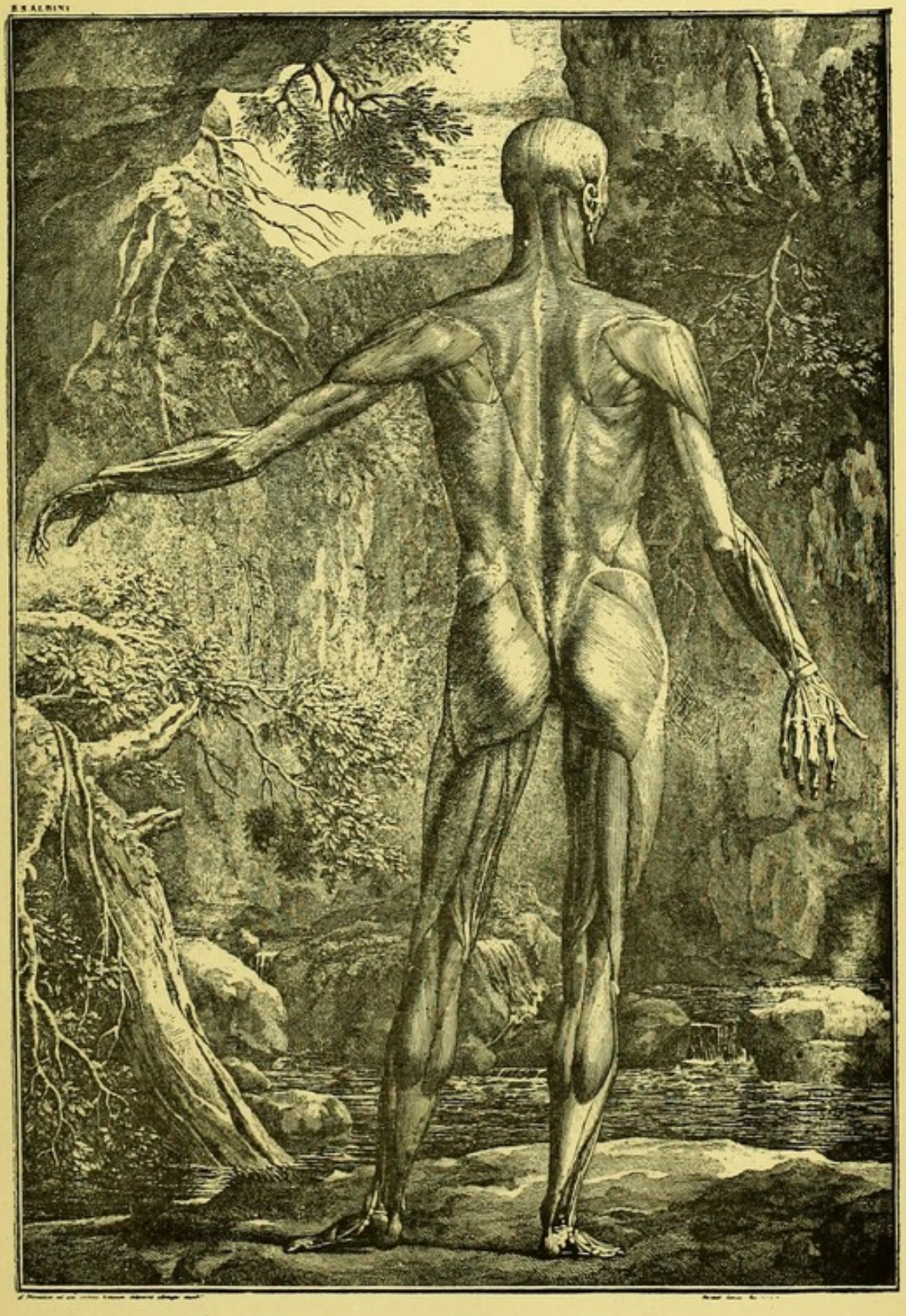
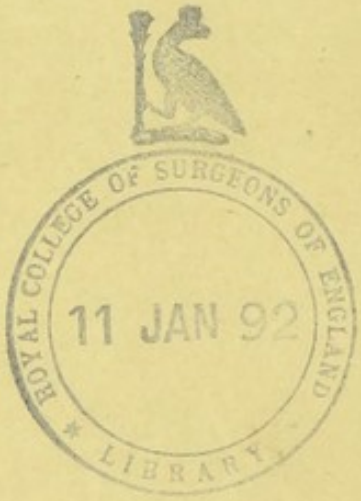


From the *Tabulæ sceleti et musculorum corporis humani*,
by Bernard Siegfried Albinus. Leyden, 1747. Fol. max.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