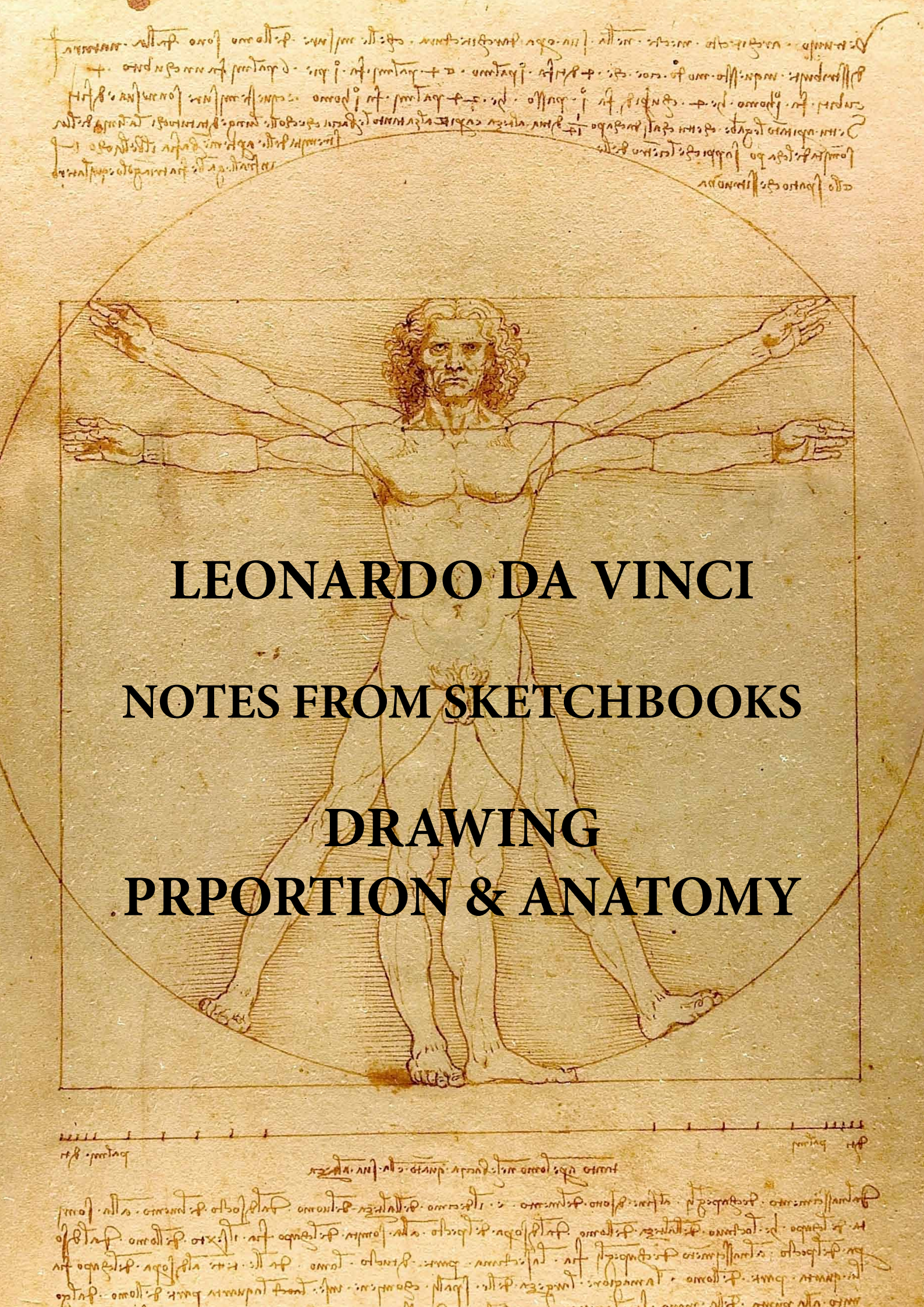
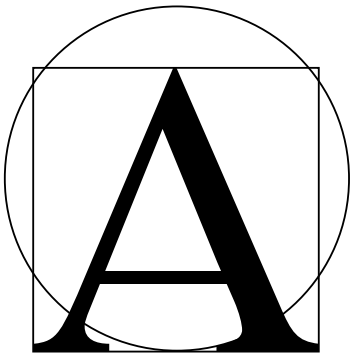


LEONARDO DA VINCI

NOTES FROM SKETCHBOOKS

DRAWING
PRPORTION & ANATOMY



LEONARDO DA VINCI

NOTES FROM SKETCHBOOKS

DRAWING PRPORTION & ANATOMY

Notes and artworks by Leonardo Da Vinci

Translated from original Italian by John Francis Rigaud

Produced by Vladimir London
Anatomy Master Class

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DRAWING

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PROPORTION

Chap. I.—What the young Student in Painting ought in the first Place to learn.

The young student should, in the first place, acquire a knowledge of perspective, to enable him to give to every object its proper dimensions: after which, it is requisite that he be under the care of an able master, to accustom him, by degrees, to a good style of drawing the parts. Next, he must study Nature, in order to confirm and fix in his mind the reason of those precepts which he has learnt. He must also bestow some time in viewing the works of various old masters, to form his eye and judgment, in order that he may be able to put in practice all that he has been taught.

Chap. II.—Rule for a young Student in Painting.

The organ of sight is one of the quickest, and takes in at a single glance an infinite variety of forms; notwithstanding which, it cannot perfectly comprehend more than one object at a time. For example, the reader, at one look over this page, immediately perceives it full of different characters; but he cannot at the same moment distinguish each letter, much less can he comprehend their meaning. He must consider it word by word, and line by line, if he be desirous of forming a just notion of these characters. In like manner, if we wish to ascend to the top of an edifice, we must be content to advance step by step, otherwise we shall never be able to attain it.

A young man, who has a natural inclination to the study of this art, I would advise to act thus: In order to acquire a true notion of the form of things, he must begin by studying the parts which compose them, and not pass to a second till he has well stored his memory, and sufficiently practised the first; otherwise he loses his time, and will most certainly protract his studies. And let him remember to acquire accuracy before he attempts quickness.

Chap. III.—How to discover a young Man's Disposition for Painting.

Many are very desirous of learning to draw, and are very fond of it, who are, notwithstanding, void of a proper disposition for it. This may be known by their want of perseverance; like boys, who draw every thing in a hurry, never finishing, or shadowing.

Chap. IV.—Of Painting, and its Divisions.

Painting is divided into two principal parts. The first is the figure, that is, the lines which distinguish the forms of bodies, and their component parts. The second is the colour contained within those limits.

Chap. V.—Division of the Figure.

The form of bodies is divided into two parts; that is, the proportion of the members to each other, which must correspond with the whole; and the motion, expressive of what passes in the mind of the living figure.

Chap. VI.—Proportion of Members.

The proportion of members is again divided into two parts, viz. equality, and motion. By equality is meant (besides the measure corresponding with the whole), that you do not confound the members of a young subject with those of old age, nor plump ones with those that are lean; and that, moreover, you do not blend the robust and firm muscles of man with feminine softness: that the attitudes and motions of old age be not expressed with the quickness and alacrity of youth; nor those of a female figure like those of a vigorous young man. The motions and members of a strong man should be such as to express his perfect state of health.

Chap. VII.—Of Dimensions in general.

In general, the dimensions of the human body are to be considered in the length, and not in the breadth; because in the wonderful works of Nature, which we endeavour to imitate, we cannot in any species find any one part in one model precisely similar to the same part in another. Let us be attentive, therefore, to the variation of forms, and avoid all monstrosities of proportion; such as long legs united to short bodies, and narrow chests with long arms. Observe also attentively the measure of joints, in which Nature is apt to vary considerably; and imitate her example by doing the same.

Chap. VIII.—Motion, Changes, and Proportion of Members.

The measures of the human body vary in each member, according as it is more or less bent, or seen in different views, increasing on one side as much as they diminish on the other.

Chap. IX.—The Difference of Proportion between Children and grown Men.

In men and children I find a great difference between the joints of the one and the other in the length of the bones. A man has the length of two heads from the extremity of one shoulder to the other, the same from the shoulder to the elbow, and from the elbow to the fingers; but the child has only one, because Nature gives the proper size first to the seat of the intellect, and afterwards to the other parts.

Chap. X.—The Alterations in the Proportion of the human Body from Infancy to full Age.

A man, in his infancy, has the breadth of his shoulders equal to the length of the face, and to the length of the arm from the shoulder to the elbow, when the arm is bent. It is the same again from the lower belly to the knee, and from the knee to the foot. But, when a man is arrived at the period of his full growth, every one of these dimensions becomes double in length, except the face, which, with the top of the head, undergoes but very little alteration in length. A well-proportioned and full-grown man, therefore, is ten times the length of his face; the breadth of his shoulders will be two faces, and in like manner all the above lengths will be double. The rest will be explained in the general measurement of the human body.

Chap. XI.—Of the Proportion of Members.

All the parts of any animal whatever must be correspondent with the whole. So that, if the body be short and thick, all the members belonging to it must be the same. One that is long and thin must have its parts of the same kind; and so of the middle size. Something of the same may be observed in plants, when uninjured by men or tempests; for when thus injured they bud and grow again, making young shoots from old plants, and by those means destroying their natural symmetry.

Chap. XII.—That every Part be proportioned to its Whole.

If a man be short and thick, be careful that all his members be of the same nature, viz. short arms and thick, large hands, short fingers, with broad joints; and so of the rest.

Chap. XIII.—Of the Proportion of the Members.

Measure upon yourself the proportion of the parts, and, if you find any of them defective, note it down, and be very careful to avoid it in drawing your own compositions. For this is reckoned a common fault in painters, to delight in the imitation of themselves.

Chap. XIV.—The Danger of forming an erroneous Judgment in regard to the Proportion and Beauty of the Parts.

If the painter has clumsy hands, he will be apt to introduce them into his works, and so of any other part of his person, which may not happen to be so beautiful as it ought to be. He must, therefore, guard particularly against that self-love, or too good opinion of his own person, and study by every means to acquire the knowledge of what is most beautiful, and of his own defects, that he may adopt the one and avoid the other.

Chap. XV.—Another Precept.

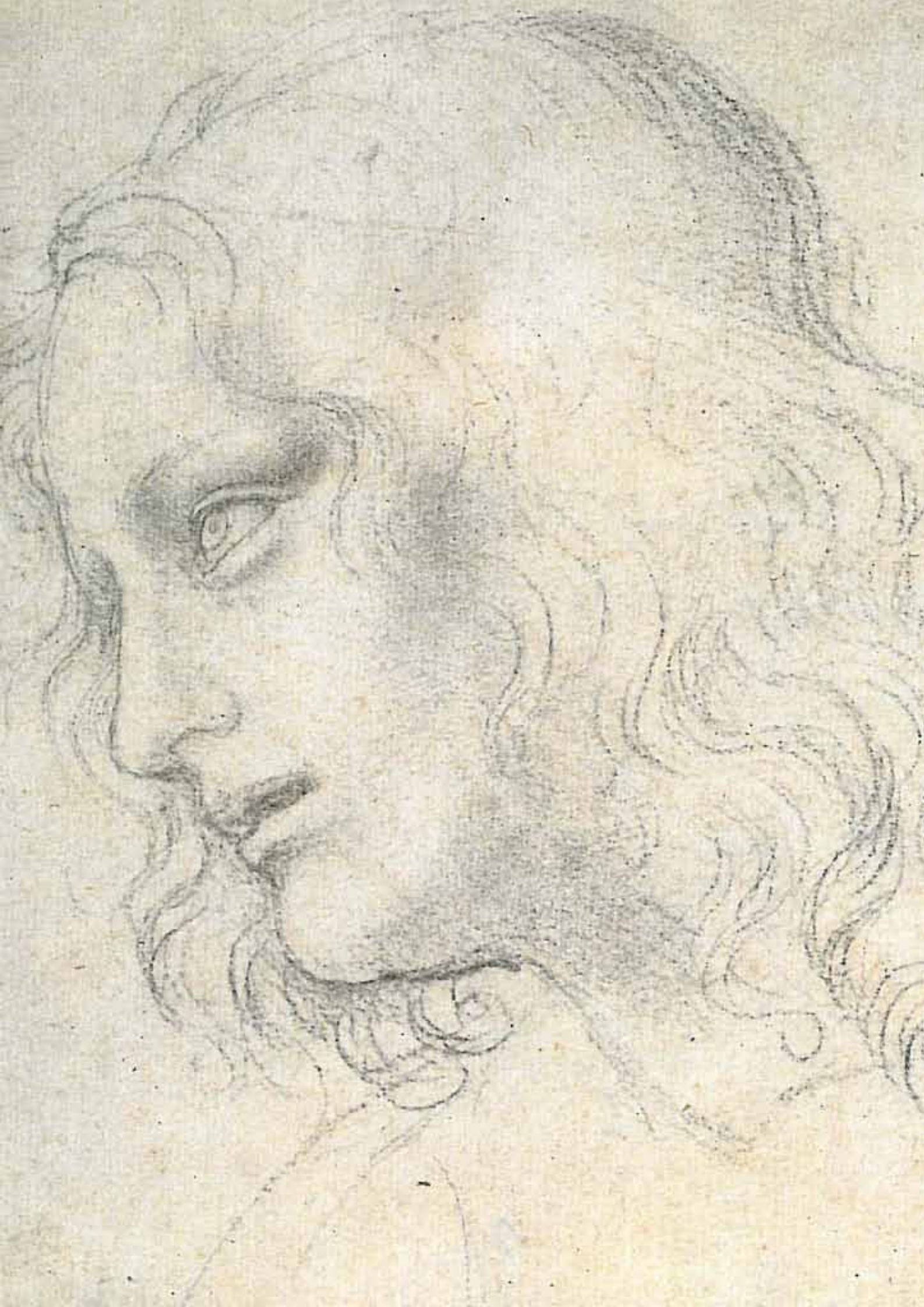
The young painter must, in the first instance, accustom his hand to copying the drawings of good masters; and when his hand is thus formed, and ready, he should, with the advice of his director, use himself also to draw from relievos; according to the rules we shall point out in the treatise on drawing from relievos.

Chap. XVI.—The Manner of drawing from Relievos, and rendering Paper fit for it.

When you draw from relievos, tinge your paper of some darkish demi-tint. And after you have made your outline, put in the darkest shadows, and, last of all, the principal lights, but sparingly, especially the smaller ones; because those are easily lost to the eye at a very moderate distance.

Chap. XVII.—Of drawing from Casts or Nature.

In drawing from relievo, the draftsman must place himself in such a manner, as that the eye of the figure to be drawn be level with his own.



Chap. XVIII.—To draw Figures from Nature.

Accustom yourself to hold a plummet in your hand, that you may judge of the bearing of the parts.

Chap. XIX.—Of drawing from Nature.

When you draw from Nature, you must be at the distance of three times the height of the object; and when you begin to draw, form in your own mind a certain principal line (suppose a perpendicular); observe well the bearing of the parts towards that line; whether they intersect, are parallel to it, or oblique.

Chap. XX.—Of drawing Academy Figures.

When you draw from a naked model, always sketch in the whole of the figure, suiting all the members well to each other; and though you finish only that part which appears the best, have a regard to the rest, that, whenever you make use of such studies, all the parts may hang together.

In composing your attitudes, take care not to turn the head on the same side as the breast, nor let the arm go in a line with the leg. If the head turn towards the right shoulder, the parts must be lower on the left side than on the other; but if the chest come forward, and the head turn towards the left, the parts on the right side are to be the highest.

Chap. XXI.—Of studying in the Dark, on first waking in the Morning, and before going to sleep.

I have experienced no small benefit, when in the dark and in bed, by retracing in my mind the outlines of those forms which I had previously studied, particularly such as had appeared the most difficult to comprehend and retain; by this method they will be confirmed and treasured up in the memory.

Chap. XXII.—Observations on drawing Portraits.

The cartilage, which raises the nose in the middle of the face, varies in eight different ways. It is equally straight, equally concave, or equally convex, which is the first sort. Or, secondly, unequally straight, concave, or convex. Or, thirdly, straight in the upper part, and concave in the under. Or, fourthly, straight again in the upper part, and convex in those below. Or, fifthly, it may be concave and straight beneath. Or, sixthly, concave above, and convex below. Or, seventhly, it may be convex in the upper part, and straight in the lower. And in the eighth and last place, convex above, and concave beneath.

The uniting of the nose with the brows is in two ways, either it is straight or concave. The forehead has three different forms. It is straight, concave, or round. The first is divided into two parts, viz. it is either convex in the upper part, or in the lower, sometimes both; or else flat above and below.

Chap. XXIII.—The Method of retaining in the Memory the Likeness of a Man, so as to draw his Profile, after having seen him only once.

You must observe and remember well the variations of the four principal features in the profile; the nose, mouth, chin, and forehead. And first of the nose, of which there are three different sorts, straight, concave, and convex. Of the straight there are but four variations, short or long, high at the end, or low. Of the concave there are three sorts; some have the concavity above, some in the middle, and some at the end. The convex noses also vary three ways; some project in the upper part, some in the middle, and others at the bottom. Nature, which seems to delight in infinite variety, gives again three changes to those noses which have a projection in the middle; for some have it straight, some concave, and some convex.

Chap. XXIV.—How to remember the Form of a Face.

If you wish to retain with facility the general look of a face, you must first learn how to draw well several faces, mouths, eyes, noses, chins, throats, necks, and shoulders; in short, all those principal parts which distinguish one man from another. For instance, noses are often different sorts. Straight, bunched, concave, some raised above, some below the middle, aquiline, flat, round, and sharp. These affect the profile. In the front view there are eleven different sorts. Even, thick in the middle, thin in the middle, thick at the tip, thin at the beginning, thin at the tip, and thick at the beginning. Broad, narrow, high, and low nostrils; some with a large opening, and some more shut towards the tip.

The same variety will be found in the other parts of the face, which must be drawn from Nature, and retained in the memory. Or else, when you mean to draw a likeness from memory, take with you a pocket-book, in which you have marked all these variations of features, and after having given a look at the face you mean to draw, retire a little aside, and note down in your book which of the features are similar to it; that you may put it all together at home.

Chap. XXV.—That a Painter should take Pleasure in the Opinion of every body.

A painter ought not certainly to refuse listening to the opinion of any one; for we know that, although a man be not a painter, he may have just notions of the forms of men; whether a man has a hump on his back, a thick leg, or a large hand; whether he be lame, or have any other defect. Now, if we know that men are able to judge of the works of Nature, should we not think them more able to detect our errors?

DRAWING

—

ANATOMY

Chap. XXVI.—What is principally to be observed in Figures.

The principal and most important consideration required in drawing figures, is to set the head well upon the shoulders, the chest upon the hips, the hips and shoulders upon the feet.

Chap. XXVII.—Mode of Studying.

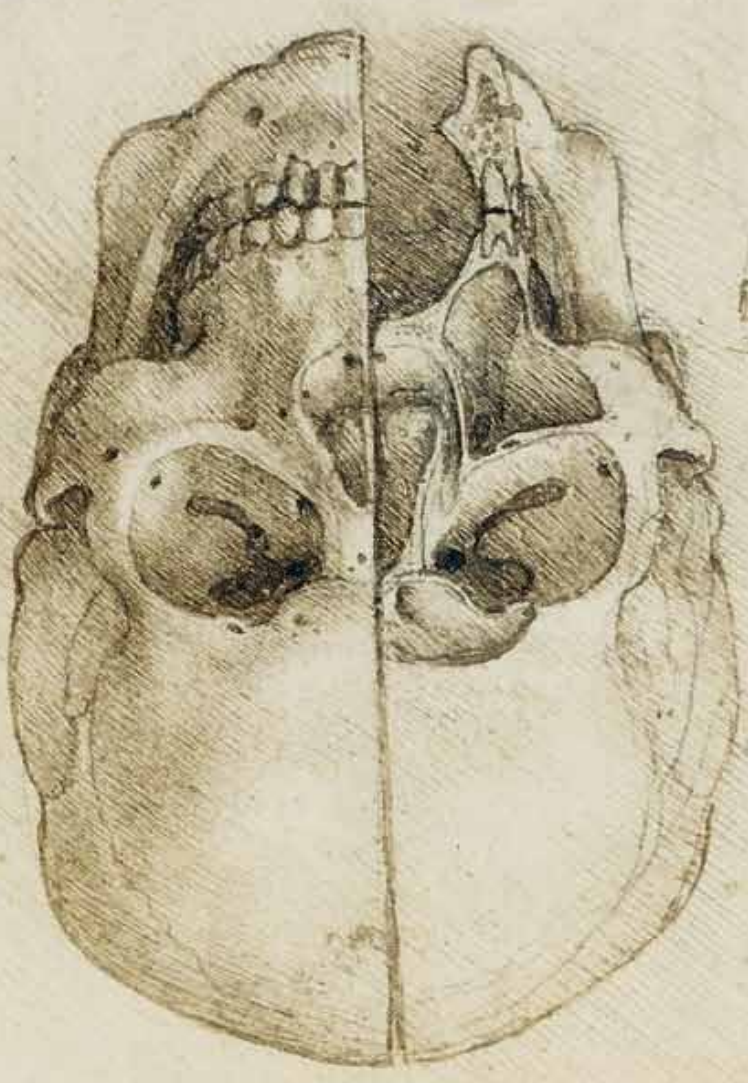
Study the science first, and then follow the practice which results from that science. Pursue method in your study, and do not quit one part till it be perfectly engraven in the memory; and observe what difference there is between the members of animals and their joints.

Chap. XXVIII.—Of being universal.

It is an easy matter for a man who is well versed in the principles of his art, to become universal in the practice of it, since all animals have a similarity of members, that is, muscles, tendons, bones, &c. These only vary in length or thickness, as will be demonstrated in the Anatomy. As for aquatic animals, of which there is great variety, I shall not persuade the painter to take them as a rule, having no connexion with our purpose.

Chap. XXIX.—A Precept for the Painter.

It reflects no great honour on a painter to be able to execute only one thing well, such as a head, an academy figure, or draperies, animals, landscape, or the like, confining himself to some particular object of study; because there is scarcely a person so void of genius as to fail of success, if he apply earnestly to one branch of study, and practise it continually.



Chap. XXX.—Of the Measures of the human Body, and the bending of Members.

It is very necessary that painters should have a knowledge of the bones which support the flesh by which they are covered, but particularly of the joints, which increase and diminish the length of them in their appearance. As in the arm, which does not measure the same when bent, as when extended; its difference between the greatest extension and bending, is about one eighth of its length. The increase and diminution of the arm is effected by the bone projecting out of its socket at the elbow; which, as is seen in figure A B.

It is lengthened from the shoulder to the elbow; the angle it forms being less than a right angle. It will appear longer as that angle becomes more acute, and will shorten in proportion as it becomes more open or obtuse.

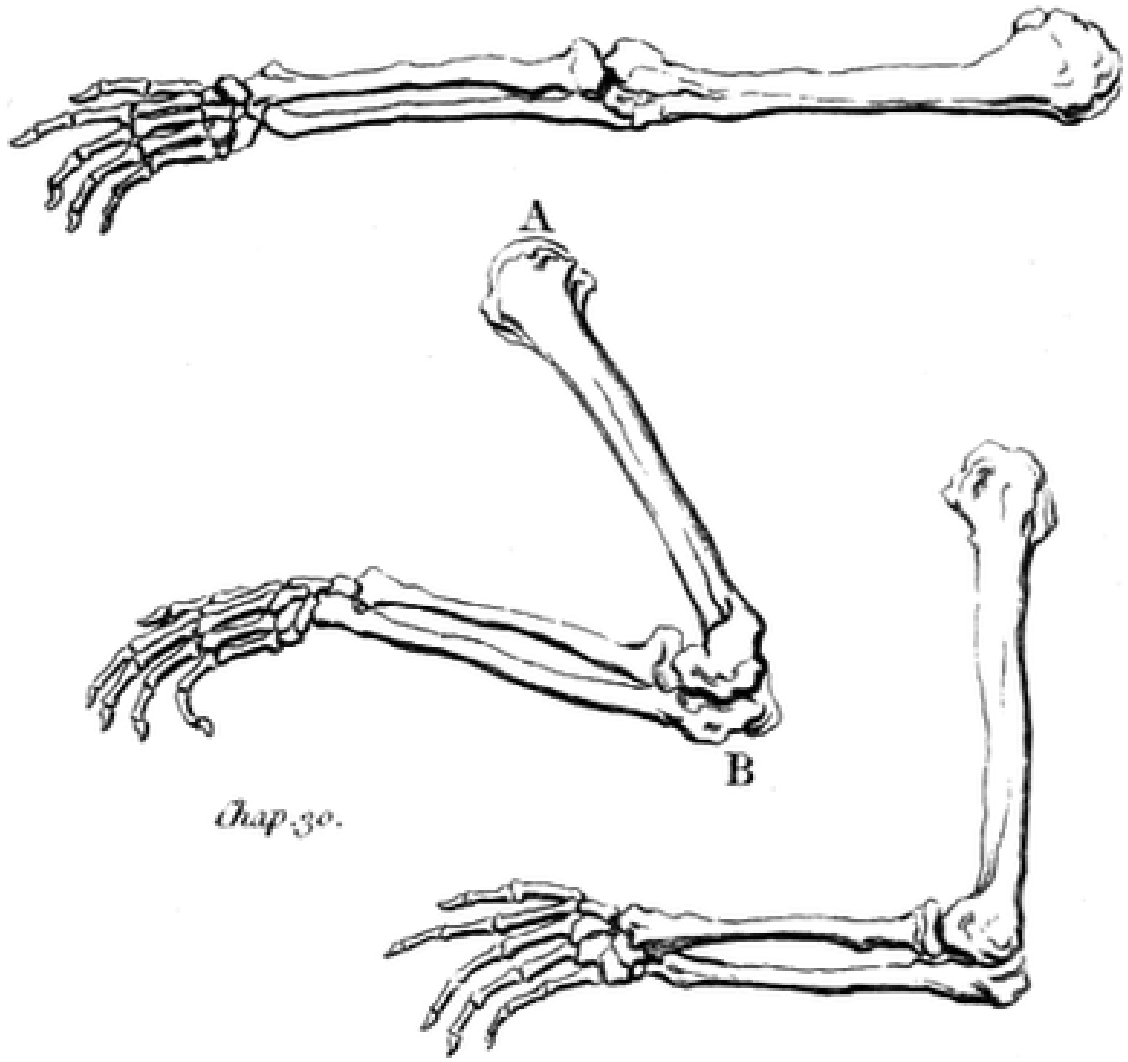


Illustration by John Sidney Hawkins

Chap. XXXI.—Of the small Bones in several Joints of the human Body.

There are in the joints of the human body certain small bones, fixed in the middle of the tendons which connect several of the joints. Such are the patellas of the knees, and the joints of the shoulders, and those of the feet. They are eight in number, one at each shoulder, one at each knee, and two at each foot under the first joint of the great toe towards the heel. These grow extremely hard as a man advances in years.

Chap. XXXII.—Memorandum to be observed by the Painter.

Note down which muscles and tendons are brought into action by the motion of any member, and when they are hidden. Remember that these remarks are of the greatest importance to painters and sculptors, who profess to study anatomy, and the science of the muscles. Do the same with children, following the different gradations of age from their birth even to decrepitude, describing the changes which the members, and particularly the joints, undergo; which of them grow fat, and which lean.

Chap. XXXIII.—The Shoulders.

The joints of the shoulders, and other parts which bend, shall be noticed in their places in the Treatise on Anatomy, where the cause of the motions of all the parts which compose the human body shall be explained.

Chap. XXXIV.—The Difference of Joints between Children and grown Men.

Young children have all their joints small, but they are thick and plump in the spaces between them; because there is nothing upon the bones at the joints, but some tendons to bind the bones together. The soft flesh, which is full of fluids, is enclosed under the skin in the space between the joints; and as the bones are bigger at the joints than in the space between them, the skin throws off in the progress to manhood that superfluity, and draws nearer to the bones, thinning the whole part together. But upon the joints it does not lessen, as there is nothing but cartilages and tendons. For these reasons children are small in the joints, and plump in the space between, as may be observed in their fingers, arms, and narrow shoulders. Men, on the contrary, are large and full in the joints, in the arms and legs; and where children have hollows, men are knotty and prominent.

Chap. XXXV.—Of the Joints of the Fingers.

The joints of the fingers appear larger on all sides when they bend; the more they bend the larger they appear. The contrary is the case when straight. It is the same in the toes, and it will be more perceptible in proportion to their fleshiness.

Chap. XXXVI.—Of the Joint of the Wrist.

The wrist or joint between the hand and arm lessens on closing the hand, and grows larger when it opens. The contrary happens in the arm, in the space between the elbow and the hand, on all sides; because in opening the hand the muscles are extended and thinned in the arm, from the elbow to the wrist; but when the hand is shut, the same muscles swell and shorten. The tendons alone start, being stretched by the clenching of the hand.

Chap. XXXVII.—Of the Joint of the Foot.

The increase and diminution in the joint of the foot is produced on that side where the tendons are seen, as D E F, which increases when the angle is acute, and diminishes when it becomes obtuse. It must be understood of the joint in the front part of the foot A B C.

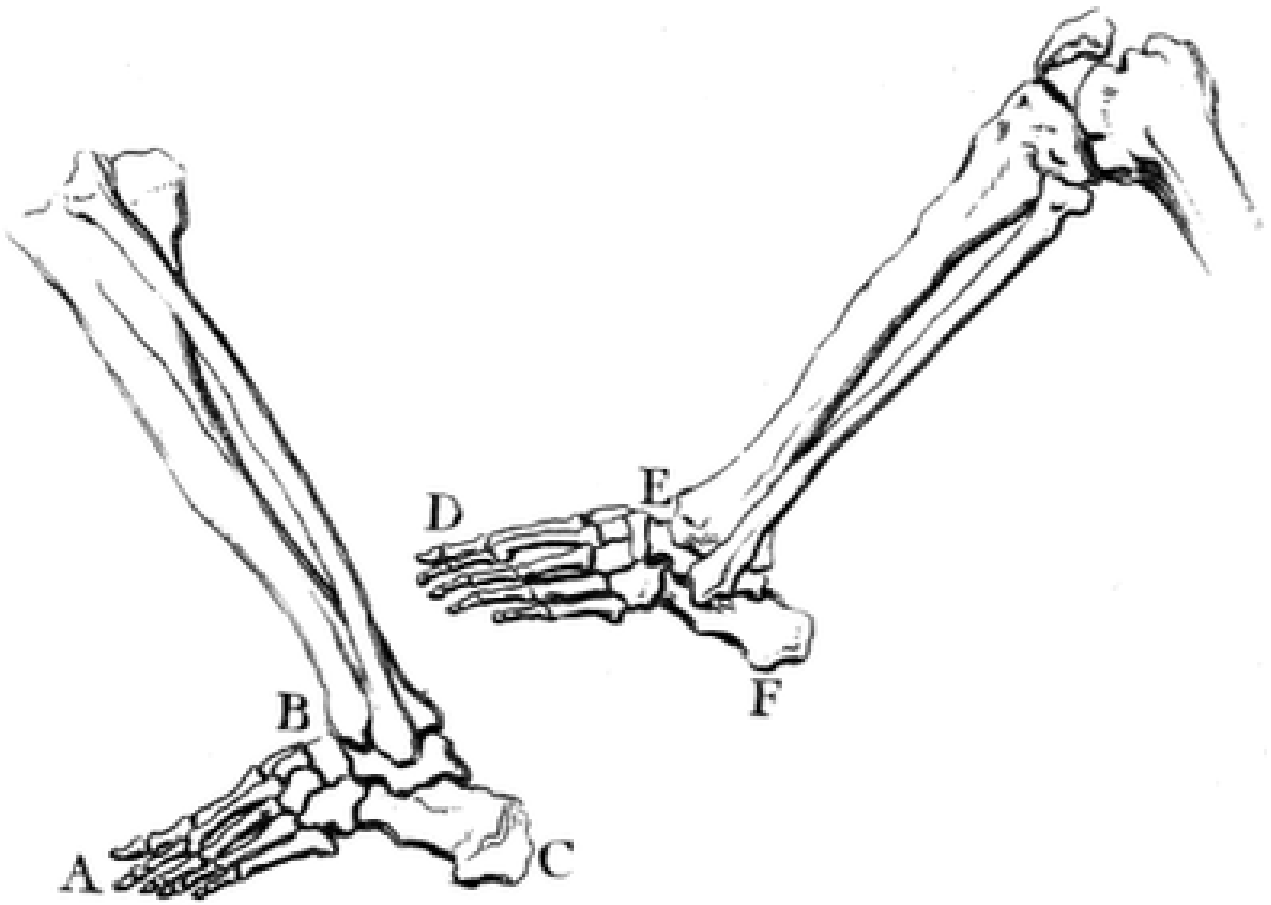


Illustration by John Sidney Hawkins

Chap. XXXVIII.—Of the Knee.

Of all the members which have pliable joints, the knee is the only one that lessens in the bending, and becomes larger by extension.

Chap. XXXIX.—Of the Joints.

All the joints of the human body become larger by bending, except that of the leg.

Chap. XL.—Of the Naked.

When a figure is to appear nimble and delicate, its muscles must never be too much marked, nor are any of them to be much swelled. Because such figures are expressive of activity and swiftness, and are never loaded with much flesh upon the bones. They are made light by the want of flesh, and where there is but little flesh there cannot be any thickness of muscles.

Chap. XLI.—Of the Thickness of the Muscles.

Muscular men have large bones, and are in general thick and short, with very little fat; because the fleshy muscles in their growth contract closer together, and the fat, which in other instances lodges between them, has no room. The muscles in such thin subjects, not being able to extend, grow in thickness, particularly towards their middle, in the parts most removed from the extremities.

Chap. XLII.—Fat Subjects have small Muscles.

Though fat people have this in common with muscular men, that they are frequently short and thick, they have thin muscles; but their skin contains a great deal of spongy and soft flesh full of air; for that reason they are lighter upon the water, and swim better than muscular people.

Chap. XLIII.—Which of the Muscles disappear in the different Motions of the Body.

In raising or lowering the arm, the pectoral muscles disappear, or acquire a greater relievo. A similar effect is produced by the hips, when they bend either inwards or outwards. It is to be observed, that there is more variety of appearances in the shoulders, hips, and neck, than in any other joint, because they are susceptible of the greatest variety of motions. But of this subject I shall make a separate treatise.

Chap. XLIV.—Of the Muscles.

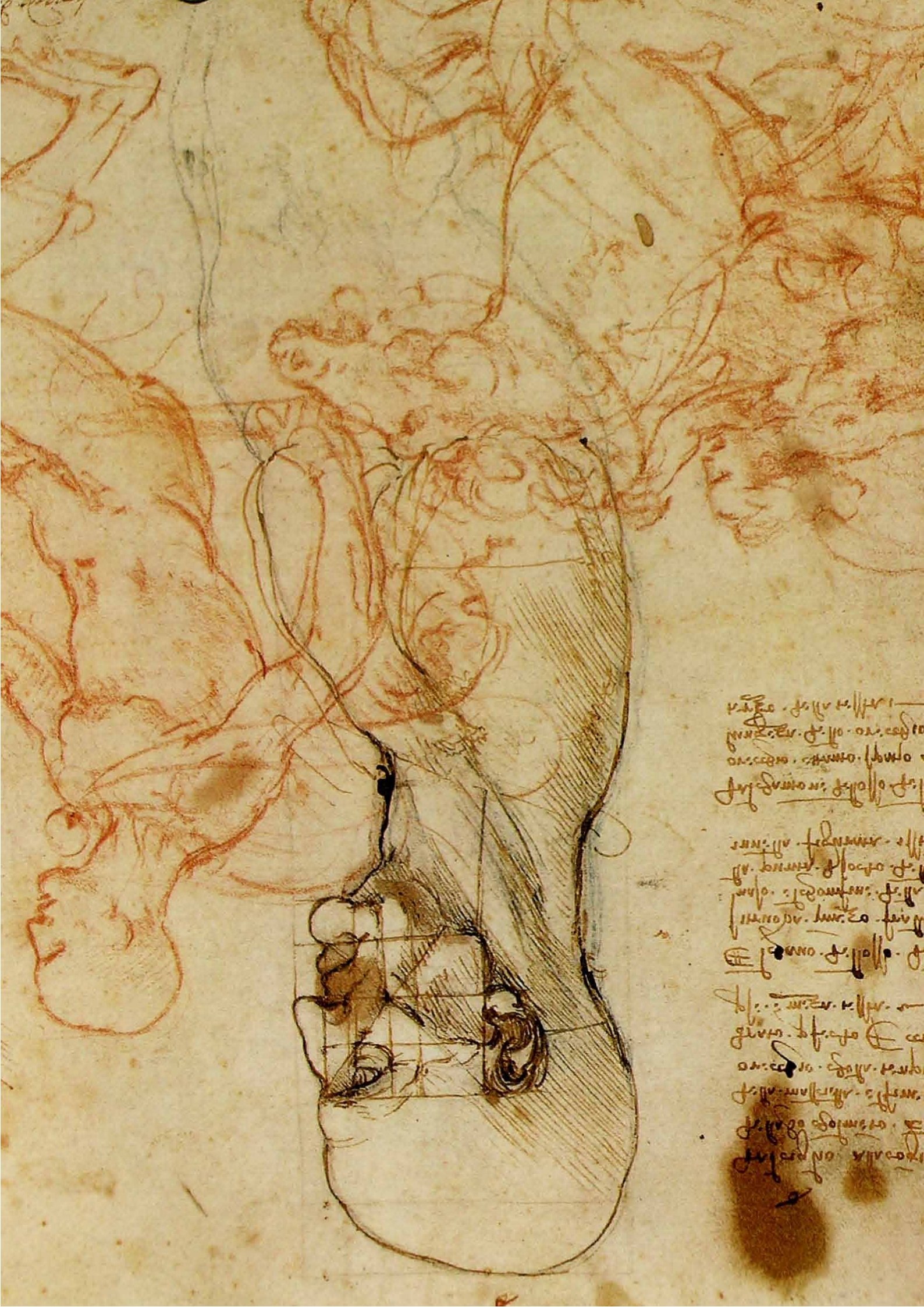
The muscles are not to be scrupulously marked all the way, because it would be disagreeable to the sight, and of very difficult execution. But on that side only where the members are in action, they should be pronounced more strongly; for muscles that are at work naturally collect all their parts together, to gain increase of strength, so that some small parts of those muscles will appear, that were not seen before.

Chap. XLV.—Of the Muscles.

The muscles of young men are not to be marked strongly, nor too much swelled, because that would indicate full strength and vigour of age, which they have not yet attained. Nevertheless they must be more or less expressed, as they are more or less employed. For those which are in motion are always more swelled and thicker than those which remain at rest. The intrinsic and central line of the members which are bent, never retains its natural length.

Chap. XLVI.—The Extension and Contraction of the Muscles.

The muscle at the back part of the thigh shows more variety in its extension and contraction, than any other in the human body; the second, in that respect, are those which compose the buttocks; the third, those of the back; the fourth, those of the neck; the fifth, those of the shoulders; and the sixth, those of the Abdomen, which, taking their rise under the breast, terminate under the lower belly; as I shall explain when I speak of each.



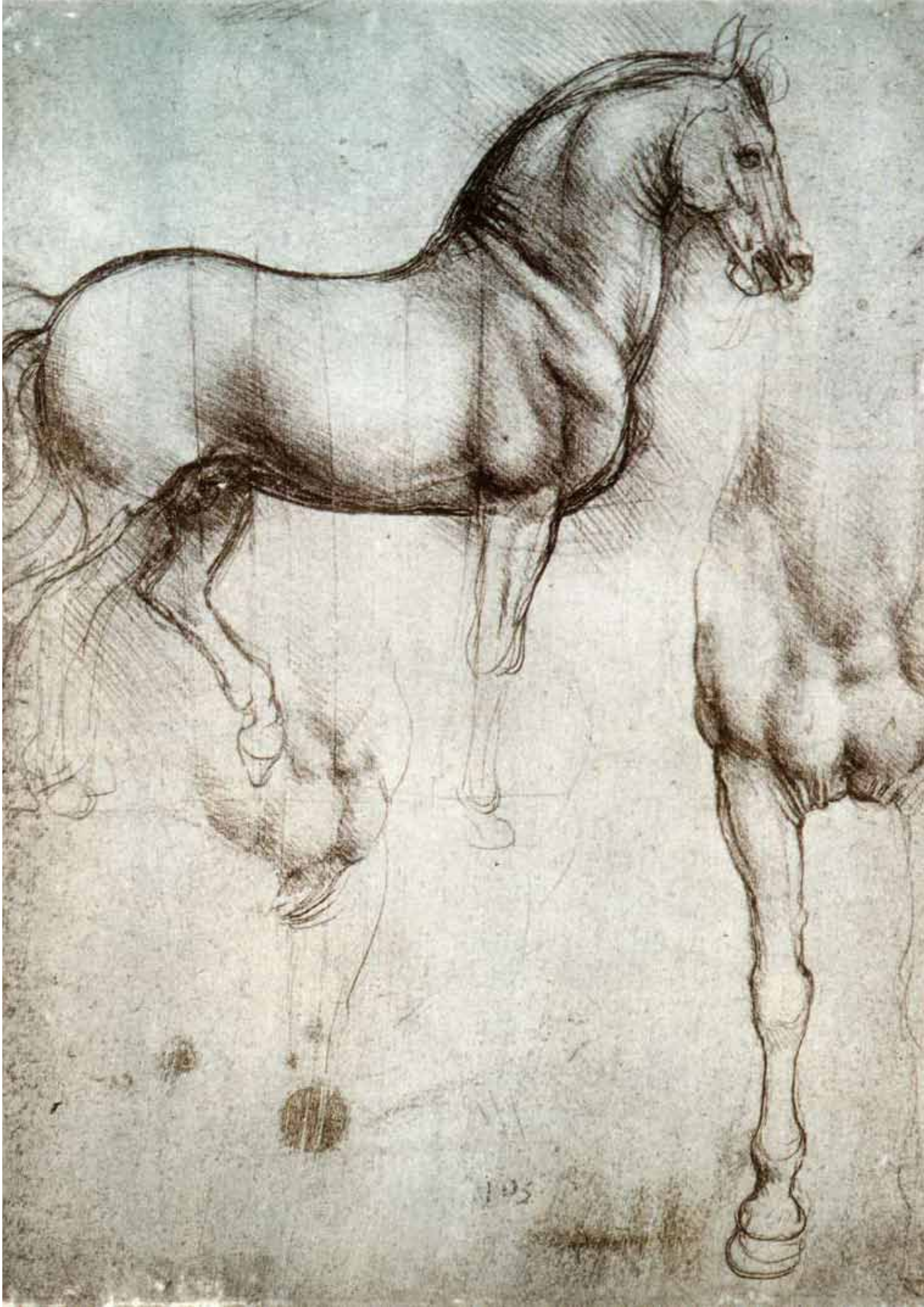
Chap. XLVII.—Of the Muscle between the Chest and the lower Belly.

There is a muscle which begins under the breast at the Sternum, and is inserted into, or terminates at the Os pubis, under the lower belly. It is called the Rectus of the Abdomen; it is divided, lengthways, into three principal portions, by transverse tendinous intersections or ligaments, viz. the superior part, and a ligament; the second part, with its ligaments; and the third part, with the third ligament; which last unites by tendons to the Os pubis. These divisions and intersections of the same muscle are intended by nature to facilitate the motion when the body is bent or distended. If it were made of one piece, it would produce too much variety when extended, or contracted, and also would be considerably weaker. When this muscle has but little variety in the motion of the body, it is more beautiful.

Chap. XLVIII.—Of a Man's complex Strength, but first of the Arm.

The muscles which serve either to straighten or bend the arm, arise from the different processes of the Scapula; some of them from the protuberances of the Humerus, and others about the middle of the Os humeri. The extensors of the arm arise from behind, and the flexors from before.

That a man has more power in pulling than in pushing, has been proved by the ninth proposition De Ponderibus, where it is said, that of two equal weights, that will have the greatest power which is farthest removed from the pole or centre of its balance.



Chap. XLIX.—In which of the two Actions, Pulling or Pushing, a Man has the greatest Power.

A man has the greatest power in pulling, for in that action he has the united exertion of all the muscles of the arm, while some of them must be inactive when he is pushing; because when the arm is extended for that purpose, the muscles which move the elbow cannot act, any more than if he pushed with his shoulders against the column he means to throw down; in which case only the muscles that extend the back, the legs under the thigh, and the calves of the legs, would be active. From which we conclude, that in pulling there is added to the power of extension the strength of the arms, of the legs, of the back, and even of the chest, if the oblique motion of the body require it. But in pushing, though all the parts were employed, yet the strength of the muscles of the arms is wanting; for to push with an extended arm without motion does not help more than if a piece of wood were placed from the shoulder to the column meant to be pushed down.

Chap. L.—Of the bending of Members, and of the Flesh round the bending Joint.

The flesh which covers the bones near and at the joints, swells or diminishes in thickness according to their bending or extension; that is, it increases at the inside of the angle formed by the bending, and grows narrow and lengthened on the outward side of the exterior angle. The middle between the convex and concave angle participates of this increase or diminution, but in a greater or less degree as the parts are nearer to, or farther from, the angles of the bending joints.

Chap. LI.—Of the naked Body.

The members of naked men who work hard in different attitudes, will shew the muscles more strongly on that side where they act forcibly to bring the part into action; and the other muscles will be more or less marked, in proportion as they co-operate in the same motion.

Chap. LII.—Of a Ligament without Muscles.

Where the arm joins with the hand, there is a ligament, the largest in the human body, which is without muscles, and is called the strong ligament of the Carpus; it has a square shape, and serves to bind and keep close together the bones of the arm, and the tendons of the fingers, and prevent their dilating, or starting out.

Chap. LIII.—Of Creases.

In bending the joints the flesh will always form a crease on the opposite side to that where it is tight.

Chap. LIV.—How near behind the Back one Arm can be brought to the other.

When the arms are carried behind the back, the elbows can never be brought nearer than the length from the elbow to the end of the longest finger; so that the fingers will not be seen beyond the elbows, and in that situation, the arms with the shoulders form a perfect square. The greatest extension of the arm across the chest is, when the elbow comes over the pit of the stomach; the elbow and the shoulder in this position, will form an equilateral triangle.

Chap. LV.—Of the Muscles.

A naked figure being strongly marked, so as to give a distinct view of all the muscles, will not express any motion; because it cannot move, if some of its muscles do not relax while the others are pulling. Those which relax cease to appear in proportion as the others pull strongly and become apparent.

Chap. LVI.—Of the Muscles.

The muscles of the human body are to be more or less marked according to their degree of action. Those only which act are to be shewn, and the more forcibly they act, the stronger they should be pronounced. Those that do not act at all must remain soft and flat.

Chap. LVII.—Of the Bending of the Body.

The bodies of men diminish as much on the side which bends, as they increase on the opposite side. That diminution may at last become double, in proportion to the extension on the other side. But of this I shall make a separate treatise.

Chap. LVIII.—The same Subject.

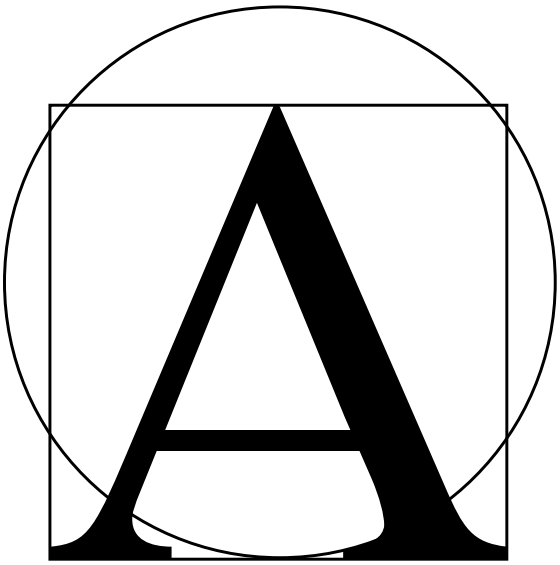
The body which bends, lengthens as much on one side as it shortens on the other; but the central line between them will never lessen or increase.

Chap. LIX.—The Necessity of anatomical Knowledge.

The painter who has obtained a perfect knowledge of the nature of the tendons and muscles, and of those parts which contain the most of them, will know to a certainty, in giving a particular motion to any part of the body, which, and how many of the muscles give rise and contribute to it; which of them, by swelling, occasion their shortening, and which of the cartilages they surround.

He will not imitate those who, in all the different attitudes they adopt, or invent, make use of the same muscles, in the arms, back, or chest, or any other parts.


LA BELLE FERONIÈRE
LEONARD D'AVINCI



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