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BEING A NUMBER OF HINTS FOR THE STUDENT AND DESIGNER UPON THE TREATMENT OF THE HUMAN FIGURE

BY

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INTRODUCTION

THE hints and suggestions which make up this book have been put together in the hope that they may assist the student and designer in their study of the human figure. That acquaintance with the form, construction, and action of the body, so valuable to the artist, and indispensable to him who has to work without models, is perhaps only to be cultivated, as the word itself suggests, by close and continual observation. Books cannot, to the art-student, stand in place of research, nor can anything said in them be really of value to him, till he has re-discovered it himself. The proper function of such books is then to indicate where the treasure lies and what it is, thus shortening the term of studentship.

The author knows only too well how great a gap there is between what he here presents to the reader and the figure itself, a gap which the ablest of pens could hardly have hoped to fill up. Further, he has not presumed to write a book upon artistic anatomy, which has only been employed so far as it provides names for what otherwise would have to be called knobs, lumps, and cords, while many of the anatomical facts have merely been introduced to save the reader the trouble of turning to other books. As regards the action of the muscles, very little has been said, since it has been thought that the appearance of the body in its movements and positions is only to be acquired in the ordinary artistic way, by noting the attitude of any figure one may happen to see. In fact, every figure, and not merely the posed model, should serve the draughtsman in this way. All day long one may thus be picking up the only knowledge which is really serviceable. Faces, too, must be as critically examined.

If the student be so unfortunate as not to be able to attend a life class, or to hire a model, the best substitute is to draw from photographs of the nude. Drawing from the imagination is also an excellent means of obtaining command of the figure. Imagination is very largely memory however, and so the student needs to see as many figures as he can, so that his head may be full of them, if one may so speak. He should, further, draw at least one figure a day, small or large, no matter what. He should always make the figures mean something, and be something—men fighting, running away, scrambling out of the reach of dogs, peeping round corners, or fat and jolly eating their dinners. The more the draughtsman can lose himself in the action of the figure, the more likely he is to represent it.

The following may be studied with advantage. For the drawing of the figure—The Greek vase paintings; the drawings of the Italian masters from Massaccio to Titian, especially Ghirlandajo, Verrochio, Mantegna, the Lippi, Perugino, Raphael, Leonardo, Michael Angelo, and Titian. Muntz's *Life of Raphael* contains a good store of reproductions of the master's drawings, sketches, and finished works.

Intermingled with this study one should examine Japanese drawings, particularly those of Hokusai. The figures on Urbino majolica ware are concise and instructive, and the reliefs of Donatello and Ghiberti are very valuable. In Greek terra-cottas and Roman stuccoes is much that is helpful, the technique being prompt and direct.

Of German work special attention must be given to Burgmair's 'Triumph of Maximilian,' to Dürer's 'Passions,' 'Apocalypse,' and 'Life of the Virgin,' and to Holbein's 'Dance of Death' and Bible figures. They are all not only excellent in drawing and composition, but are also valuable as being in thick line, which is by no means easy to manage.

Of the works of artists now living, or recently dead, we may mention the following. For monumental compositions, Sir E. Burne-Jones; for figure designs generally, Mr. Walter Crane, Mr. Henry Holliday, the late John Hardman Powell; Mr. Howard Pyle's *Pepper and Salt*, &c. These last are very suitable for students, the details being varied, and well carried out. For excellent drawing and composition, but less decorative, Daniel Vierge's *Don Pablo de Segovia*, and Adolf Menzel's *Frederick the Great*.

For examples of decoration of the early Gothic periods we shall turn to Viollet-le-Duc's Dictionaries of Architecture and Furniture. The illustrated catalogues of the South Kensington Museum have many valuable illustrations. The photographs to the catalogue on Ivories are remarkably good. For decorative effect we shall study the Byzantine and early Gothic periods, the Egyptian and Japanese. There are many details in the Pompeian decoration worthy of note, particularly the *curved* entablatures and frames.

One thing we cannot fail to notice in the Gothic styles, in the Japanese, and even in the Greek vase paintings, is the little variation there is in the details of the figures. That is to say, the same view of the head or hand occurs many times. Indeed, there can be no doubt that a man could do very good and expressive figure designs of a decorative character with a few heads, hands and arms, feet, and a little drapery at his command. But if he adopt the limited style here suggested he must possess either a profound interest in human life, and a desire to portray it (the pictorial genius), or a true feeling for ornamental beauty (the decorative genius). Without one or other of these the work can only be stupid and impudent.

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FIGURE DRAWING AND COMPOSITION

AIM AND METHOD

1. The Artist's Intention, Conception, and Expression of his Subject.

INTENTION, conception, and expression are the three ingredients of Art. The artist must, in the first place, *intend* to realize, to call to the mind of the spectators, or place before their eyes as if in bodily presence, some idea, whether of human experience, action, or aspiration, or of natural form, or the aspect of it, be it beautiful or not beautiful. The idea intended to be expressed is the subject.

The intention fixed, the subject has to be realized, that is, the artist has to become possessed of the understanding of what, in pictorial art, will represent to the spectator whatever natural facts the subject is concerned with. Thus, an oval with four dots within it suggests, and in rude art stands for, the human face, but it certainly does not satisfy us. So that the difference between what is to us a fair representation of a face or head, and what satisfies the child or the savage, is the difference between our and their conception of what will express those things.

The expression is the technical means of applying whatever materials we use to paint or draw with, to embody our conception or realization of the subject.

According as mastery of these three sides of the painter's art has been acquired and developed, have the results, as seen in historic compositions and drawings, exhibited different styles and characteristics.

2. Of Intention.

ONE'S intention may be developed in this way—(1) I intend to draw a Knight in armour with lance and shield. (Note, that one can easily deceive oneself even in this first step, for it may happen, and generally does in poor work, that one intends to do no such thing, but merely to draw part of a head, so much armour, and the necessary lance and shield, and not for a moment to trouble oneself about the whole of the man, the whole of the suit of armour, or how it is jointed.) And (2), since all men have individual character, and carry some history in their faces and bearing, I intend to express some such character in this knight; and I choose the character and history of Sir Galahad, or Warwick the King-maker. If the latter be chosen, correct historic details will probably be also expected. Then (3), since there is perhaps a deeper significance in things than their outward aspect reveals, I intend to endow each part with an iridescent beauty; or, since Warwick lived an actual life, I intend, while admitting all historic uglinesses, to so treat the subject that it shall be pleasing to look upon. And then (4), since my drawing is for a book illustration, I intend to so arrange the lines and masses that the design shall suit the type it is printed with, the size and shape of the page it is printed on, without necessitating any odd arrangement of type, &c.

To further illustrate "intention," we may say that the aim in Egyptian painting was to describe in the plainest terms, and also to give some degree of decorative effect; that the aim in Byzantine was to recall to the mind of the spectator the personality, spiritual rather than bodily, of the saint or king represented, with also an expression both of exalted dignity and of a sense of living eternally in the sight of heaven, and in the calm of intensest emotion.

It is not too much to say that one does not properly "intend" till one can talk with the figure one is drawing. Give him a name, a definite character; even if he is only a common cartman, street-sweeper, or what you will, let him have a history. It is because we can read the story of their lives in the men and women of Cruikshank and Leech that their works are so full of interest, and they themselves are called geniuses. In the beautiful designs of Sir E. Burne-Jones there is a similar interest. His people dwell in a romantic city, full of fair houses, where the warm glow of the evening light lasts long on the walls, where the bubbling and plashing of the fountains fills the still air with music, sad and soothing—a people mourning ever the frailty of their natures, glad of all things beautiful, praising all things lovely, gentle themselves, and purified by the long striving and long watching of their adoring spirits. Sir Edward must know all the history of these wonderful companions of his.

But though none of us have the genius of such masters as these, we yet may easily endow our figures with more interest and personality. The temptation to neglect the matter is great, because in too many quarters the dry bones of anatomical and technical accuracy are made the artistic test of the work.

3. Of Expression.

ART may be defined as—the arrangement of lines, tones, or colours, so as to express some thought or fact, or both together. The actual doing of this is the *technique* or *expression*. Expression has developed by expanding its boundaries; it was not formerly weak, and has become strong, for in the old times it was equal to the demands made upon it by its sisters Intention and Conception.

I have named three modes of expression: by line, by tone or chiaroscuro, and by colour. Each of these is dual in power, being both *explanatory* and *æsthetic.*

By explanatory I mean that it conveys to the intellect the facts which make up the subject. Thus suppose a blind man is represented just stepping into a ditch or a trap. The situation can of course be easily suggested. If to show that the man is blind he is drawn with sealed eyes, or heavy shades, then that is a diagrammatic rather than an artistic way of explaining his condition, and the diagrammatic is by no means to be despised. But it would be more artistic to rely chiefly upon the expression of those peculiarities of gait which characterize blind men. Then the poor man's stick may be shown to rest upon an assuring patch of ground, and his leg may be already raised in confidence. The requirements are all explanatory, and line alone would be quite capable of representing what has been suggested. If no more is required, tone and colour could only be used for the beauty they give, or for the sake of imitative realization. Such realization would, however, be hardly suitable in this case, and black and white could express everything.

What I have called the æsthetic qualities of art, those which appeal to the eye, rather than through it to the intellect, as reading does, correspond to those peculiarities which go to make poetry as distinguished from prose. Prose art is then that which makes statements of fact; poetic that which makes suggestions of feeling. Just what induces the poet to depart from ordinary diction and speak in verse, induces the poetic artist to employ the æsthetic qualities and capabilities of his art. The departure from the real and actual has in both cases to be made good by a corresponding wealth in another direction. If this cannot be done, it is better certainly to talk prose, or rather to merely make accurate notes of fact.

Explanatorily and æsthetically, line, chiaroscuro, and colour are probably equal, but the facility and difficulty, or safety and risk, felt or encountered in their employment, seems to propose the following restrictions.

The least offensive method of expression is line. If I may so speak, line does not "come to one" unless it is very strong, and hence it lies quiet with all its imperfections. Tone and colour, on the other hand, *do* come forward, and if they are bad there is very little excuse for them, because the power of expression in line is sufficient, in most cases.

A little shading such as helps the expression of line may be included with it, and cannot be called chiaroscuro, which requires the whole to be fully carried out in tone—as photographs.

So that a little shading may be allowed without injuring the effect, for what is used will be explanatory. Then as to colour; only when it is completely realistic is it properly demonstrative; but it may be explanatory to a quite sufficient extent for most drawings, by *suggesting* the coloration. Its office when thus used would be primarily one of definition, as in map-drawing.

Now it is very certain that none of our three modes of expression should be used without being either explanatory or beautiful. It may be both at once; but if fifty per cent. of the colour is for explanation, the other fifty must be for beauty. Very rarely indeed is natural colouring not beautiful, it seems sacrilege even to say that it ever can be, so that there is no excuse for bad colour. For if the artist cannot equal Nature's effect, which would be beautiful, he must promptly relinquish the imitative standpoint, and colour how he can, in one colour only perhaps, so long as he does it well.

Indeed to use one colour is by no means a bad way of commencing to study the subject. Say the colour is blue —choose a greenish-blue to commence with, and *vary the hue*, now toward green, now toward purple or grey, till the composition is a beautiful patch of blue. Then take two colours, and so on.

The student must rid himself of the idea that art is any the higher for being complex, that is, done in tone and colour: in the Academy style. The highest art makes the most of simple material; makes it express thought and fact, fully and adequately.

4. Of Conception.

HISTORICALLY the conception or realization of the subject has been continually advancing. The great distinctions between the works of old and modern schools are due to changes of conception. Nothing is more evident to the student of art history than the repeated assurance with which the artists of old flattered themselves that they had approached the representation of life, and had even succeeded. And the conclusion is irresistibly borne down upon the inquirer that the decorative fitness, which is so much admired in their works, is more due to their deficiency as producers of the life-like, than to their voluntary reduction of their powers of imitation before a decorative ideal. In Willars de Honnecourt's book of sketches (thirteenth century) of architecture, ornament, and the figure, there is a drawing of a lion, upon which is inscribed, "This is a lion; take notice it is drawn from the quick." From the "quick" it may be, but it is palpably conventional. If, among the conventional works of these most decorative periods, there were to be found figures recognized by the artists as imitative, and not to be used as decoration, there would be reason to regard their decorative and conventional method as one they voluntarily adopted as best suited to its functions. But the actual fact seems to have been the opposite, that their work began in the head, and picked up nature, and the aspect of it, as it could, and as it seemed to require. In all times men have sought to imitate; but their desire has not been accompanied by actual imitative power, as witness the details in Assyrian sculpture. Some primitive peoples seem to have been deficient in the desire to imitate, and to have found delight in making patterns, corrupting even the human countenance into those simple decorations, a corruption noticeable in Chinese ornament particularly. But other peoples have seemed deficient in decorative instinct, as the prehistoric reindeer draughtsman, and the modern Esquimaux. And even if art commenced as imitation, and not as pattern-making, there is no evidence that the conception of the subject was any more advanced than the resultant drawing, limited, that is, to only a general likeness. And in this connection it may be observed how very much more probable it is that animals should be represented with greater truth, in these ancient works, than man, as is historically the case. For the observation of animals would probably be the closest of all the observations of early man. Not unfrequently animals were valued above human beings, especially above women. It is well known that on the Assyrian reliefs animals are much better represented than men. The same is true of Egyptian art. It is quite possible that in Egypt the drawing of the figure was, as has always been said, restricted to a formula under which it made no progress, if indeed no retrogression, and that thus it fell behind the animal-drawing. A similar stagnation and conventionality fettered the Byzantine, and does still, according to J. B. Atkinson, whatever of really national art there is in Russia.

A most cursory examination of historic figure-work will show how the early representations are always approaching the diagrammatic. This is referred to by Sir Gardner Wilkinson in his *Ancient Egyptians*, where (vol. ii. p. 269) he speaks of the constant use of the profile in early art because of its intelligibility to the most inexperienced spectators. He mentions too how the uninstructed peasant can get on very well with the old Egyptian profiles, but that "no argument will induce him to tolerate foreshortening, the omission of those parts of the body concealed from his view by the perspective of the picture, or the introduction of shadows, particularly on the human flesh." He is "seldom able to distinguish men from animals" in an European drawing.

The fact is, that right-seeing has come only gradually. The Byzantine and early Gothic drawings were more symbols than portraits ; but a change was rapidly made in the thirteenth and fourteenth centuries. The minute hard penetrating style of the fourteenth and early fifteenth centuries, as seen in later Gothic and early Renaissance works, is possibly due to the avidity with which the masters of those times seized upon the newly seen details. From this point the acquisition of true sight is marked by representative works of great artists, till at last we find ourselves in a vortex of impressionism, which is the truest "*seeing*" yet recorded. The impressionist relies upon the spectator's sense of aspect, rather than his knowledge of the constituent parts or formation of the object represented, as the older artists did.

5. The Development of Conception among the Old Masters.

THE modern period of art may be said to commence with the twelfth century. It must have been noticed by any one who has looked carefully at works executed in the early portion of this period, how everything is shown that an ignorant person might, like Wilkinson's modern Egyptian, expect to find represented. Not only are the figures complete in having in actual visible fact all the parts that human beings are credited with, but any objects, utensils or details of any kind that play any part in the subject, are most palpably expressed, often grossly exaggerated in size. Thus the intellect was first satisfied, possibly with the barest record that such were the facts, as say a hand had four fingers and a thumb as positively shown. Within these narrow limits there was a development towards excellence; the fingers, the hand itself, while not losing their simplicity of statement, became truer and truer to form, as seen,—for all knowledge in art came then by sight. With all its rudeness the glass painting here reproduced possesses in the arms and hands qualities which well deserve study. When such qualities begin to appear one may expect changes which affect not

FIG. 1.—Glass Painting (thirteenth century).
(By permission of John B. Hardman, Esq.)

only the truth of the form as expressed in the outline, but the conception of the subject itself.

It is in Italian Art that the progress from the simple statement to the deceptive aspect can best be studied.

First in order of time came the stiff Byzantine conventional method, relying very much upon the fact that four strokes in an oval make a face, and that horizontal ovals with large dots in them made eyes for the face, and that thus one produces a Madonna, with a glance which penetrates to the very core of the worshipper's being, as is stated in Eugene Muntz's 'Raphael.'

Then came Cimabue (1240—1302), who put just the least motion into these erstwhile stiff figures. Then Duccio (circa 1320), who found that some degree of modelling might be expressed by toning in gradation against the outline. Then the Pisani (Nicola Pisano 1206—1278) unearthed some antiques, and took, in sculpture, a stride which placed them far before the painters. Giotto (1276—1337) sped to overtake them, profited by their studies, and produced bas-relief-like pictures. This sculpturesque origin of Italian art should always be remembered. Later the great names come thick and fast—Massaccio (1401—1428), Botticelli, Filippo Lippi, Perugino, Mantegna, Ghirlandajo, whose works form the glorious forenoon of Italian Art, more pleasing to many than the high noon that succeeded. The works of these masters are analytic in drawing, high in thought, and pure and direct in intention. One cannot however associate the name of any one of them with any distinct phase of art study, though Massaccio was perhaps the first to place air all round his figures.

No representations of women are more charming than those of this period. The illustration on the next page can only dimly reflect the pious beauty of the original.

To the same time belongs Uccelli (1396—1470), who diligently sought into the mystery of perspective, and who consequently delighted in placing a corpse perpendicular to the picture, and vanishing it to the centre of vision, though in the example in our National Gallery he has contented himself with so disposing the broken lances on the ground. Signorelli too took great pains to represent figures in strong fore-shortening. Leonardo specially studied shading so as to achieve deceptive roundness; Correggio, the play of light and shade upon a figure subject, and grace; Michael Angelo, difficult positions of figures; the Venetians, the value of colour and tone.

Fig. 2.—Head of a Girl.
(From a chalk drawing in the British Museum, by Ghirlandajo.)

Thus, it might be said, Italian Art was gradually put together, an accumulation of beautiful facts approaching nearer and nearer to the deceptive imitation of nature, though it seems, by doubling its sculpturesque character under Leonardo, Michael Angelo, and Raphael, to have become somewhat conventional, since these masters always seem to have expected a figure to have a light side and a dark side, and never to be lit from all around, as generally were the figures in the earlier time. So that the history of Italian Art shows us the grasp of form, of movement, of shading of the solid, uncoloured and coloured, of the play of light and shade beyond mere expression of form till parts become lost in gloom, of the power of colour as almost neutralizing shading, of the representation of foreshortened and difficultly posed figures.

The history of the growth of art in the North is possibly very different. The northern artists seem to have concerned themselves much earlier with the actual aspect than did the Italians. From Rembrandt one may step back to Holbein, from Holbein to Van Eyck, and possibly from him to the miniaturists. Whether this genealogy holds good or no, the fact remains that Van Eyck was calmly painting John Arnolfini's elaborate six-arm candelabrum while the Italians were rejoicing over their discoveries in perspective. It is evident that the Dutch and Flemings paid far greater attention to small fact than the Italians, and thus got ahead of them in deceptive representation. At the same time however they let slip, if indeed they ever possessed, the high poetic thought and feeling which characterizes the Italian work, and which was possibly the means of retarding the imitative faculty in that school.

We cannot trace therefore in northern art the "painful steps and slow" which characterize the southern, and render it so instructive to the art student. They did not understand such a thing as abstract shading and the music of it, as did Correggio or Leonardo. They were more journalists and describers than poets. There can be no doubt that they knew all about their art as well as the Italians. It was foreign to their genius to produce poems in contour as Mantegna did. They composed, selected, and arranged as completely as the Italians, and their works yield equally scientific analyses, though they aimed at photographic accuracy. They strove to lose their methods completely in the aspect of the objects represented. Wherever the method is apparent as an insistance upon outline, shape, or an attempt at more grace than is probable in the natural fact, a corresponding degree of conventionality must be the result. The Italians did not mind overstepping these bounds because they gave a degree of thought and feeling which overweighed the objection, just as the poets do, or should, when employing verse instead of ordinary work-a-day prose.

Much is to be gained by studying the works of the Old Masters, because, as has been shown, each master stands forward as an exponent of this or that particular artistic quality. It is well, indeed, for a time to inordinately admire some great master or other, and we shall indeed most truly find ourselves when we seem to be mere worshippers of others. Individuality is of the highest value, but it cannot commence its life independently.

6. Of Finish and the frequent greater success of a Sketch than of a Finished Work.

RUSKIN has called finish an added truth. Every step toward the finishing of a work is a step nearer the complete realization of the artist's intention. Thus as far as he intends so he should endeavour to finish. If he intends, desires, say the delicate curvature of an eyelid, to insist upon it as a thing to be separately contemplated, his picture is not finished till he has achieved its representation. Lorenzo de Medici would take almost equal delight in the form of the figure as in the subject it personified. But where there is no such insistence upon form there is no special demand for its delineation. There is, however, always a general demand for it; thus no one would presume to expect a drawing in which the features were all awry to receive commendation, and just as the disposition of the features must be true, so their forms must be true. The Dutch aimed at not merely presenting the image of a man, but a minute description of him, so that, if the species became lost, the pattern would remain, clear and distinct enough to make new men by. On the other hand Velasquez, in his later manner, did not seem to care whether a man could be made from one of his pictures, and indeed represented features, hands, and feet, not because he had any particular interest in them, but because the representation could not exist without them. He also generalized the eyes. To say that he did not care about eyelashes would be ridiculous, and contrary to his earlier work, but he knew perfectly well that no one was going to count the eyelashes of his figure before affirming that it represented a man. On the other hand, Teutonic Holbein must give every hair as nearly as he can, since these to him are a part of his subject's corpus, and as much to be represented as the larger details of the body.

Both men were right. They were actuated by different "intentions," due to different temperaments, and according as they intended, so they finished.

The danger of generalization is emptiness; of minuteness, the finical. The works of Velasquez, however, are not empty, nor those of Holbein finical, but it is highly probable that the productions of their devotees of to-day will be.

The lives of the great masters teach nothing so plainly as humility, and purity of aim. The student must rid himself of any notion he may have that he is clever; he must not deceive himself into fancying that by ranking himself with the great masters he becomes a partaker in their experience, and may step straight to the higher rungs of the ladder. It is the old moral about those who cry Lord! Lord! and shall not enter into the Kingdom of Heaven. The only way to follow the great masters is to work as they worked, despising no drudgery, and inflated by no notions of what is art and what not. Velasquez's and Rembrandt's early work was hard and minute. Can we hope to gain their mastery without in some way acquiring what they acquired in their early manhood? Is it not highly probable that their advice to us would be much the same as that given by the old English lutist to a pupil who desired to learn to do the shake just as the master did,—In youth I broke both my wrists, I see no other way than that you should also begin by breaking yours (Hamilton's *History of Music*).

A sketch sometimes looks better than a finished drawing because it places no limit to the ideas as does a poor finished work. Suppose the ideas in a picture number a hundred, and the artist can only grasp fifty; if he is made to finish his work he leaves fifty out, because he cannot compass them. The work thus becomes dull and stupid. But if it remain a sketch, he will probably express his fifty, and the remainder will, if not expressed, not be shut out by the finishing, and the spectator consequently credits the work with some at least of what is not there.

Vagueness and the conditions which cause it are as much matters of knowledge as are the hardest of edges. There is a vagueness *before* fact and a vagueness *after* fact, before knowledge and after knowledge. When the knowledge is too slight there is the vagueness of ignorance; with more knowledge there is the distinctness of fact; then finally with complete knowledge, knowledge not merely of the objects themselves, but of the conditions of lighting, &c., under which they are existing, there comes the second vagueness, the vagueness of true appearance. There is little doubt of the art student's becoming proficient in the first of these three courses. He must, however, master the other two, "sheer intensity of drawing" as Bastien-Lepage called it, and the vague breadth of actual appearance, before he can hope to do really artistic work.

The student must then become a Pre-Raphaelite. He must not rest till he can represent to the last touch, with the completest fidelity, the form of detail of any object that could possibly be placed before him. He must be an impressionist too.

7. Method of Drawing.

In Velasquez the impressionists see their master. In him knowledge is subordinated to aspect, but what a wealth of knowledge there was! Students impressionistically inclined overlook the fact that his early work was hard and severe, and that he studied the Antique. It was by his greater knowledge wielded by an intellect of remarkable power and comprehension, that he succeeded in eliminating his means of production. There is as much knowledge required to lose an outline as to get one.

Therefore it cannot be said that knowledge whether of the figure or anything else is bad.

The impressionist principle is not merely perception of aspect, but expression by aspect, as distinguished from

Fig. 3.—Peasants. (By Albert Dürer.)

expression by known fact. Thus it is a known fact that the fingers join on to the hand, the hand to the wrist, the wrist to the arm, and so on. In an Italian work we should probably see this connection palpably expressed by the contour flowing evenly through all the parts, and the brush forms following the lines of construction, just as the lines do in the annexed example of Dürer. This is working by construction and knowledge. But in actual aspect there is no connection as by direction of lines, &c. Each speck of tone and colour is upon its own account and independent of the rest except in that general effect of the whole, of which it is, as it were, unconscious. A drawing executed in parallel lines passing diagonally across the subject may be regarded as in the impressionist mood, as in Figs. 16 and 17.

Constructive drawing is that in which the organic relation of part to part is recognized. Thus, a fold of drapery is followed from its origin, where perhaps it is not seen, to its termination, perhaps in full view. The equal measurements of an object are recognized as appearing equal, the representation of an arm is seen to correspond to structural fact, the roundness of its section has been distinctly noted. In a drawing of the head it is seen that the farther fore-shortened side corresponds to the nearer, that the falling back of the surfaces of the cheeks agree on either side of the nose, and that the symmetrical section of the face is properly preserved. In brief, constructive drawing is sound model drawing.

The basis of the construction of the figure is the skeleton, and so the bones should receive from the student the most careful attention. Action and pose rest more in the bones than in the flesh; a figure may indeed get on very well without its flesh, as witness the extremely active "deaths" in Holbein's famous Dance. And is it not their adaptability to action that gains for the skeletons the regard of the school-boy above all other figures?

The drawing must be made in as long lines as possible, there must be no patching together of little bits. Indeed drawing must be done very much as writing, except that the whole arm should be moved and not the wrist and fingers only. The letter W is in writing as complicated a letter as we have, and yet he would be a sorry penman who wrote it in little strokes.

The general mass and shape of the figure must first be built up, so that the proportion and pose can be secured and tested. It is a great mistake to expect to begin at

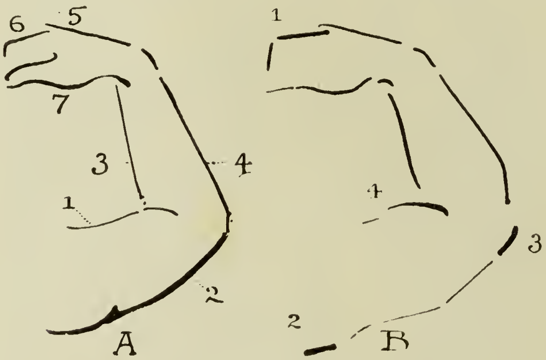

FIG. 4.

the top of the head and gradually work down to the feet, putting in all the details, and with proper proportion and pose. No error is greater than to regard the rough blocking of the figure as a waste of time. It is no doubt very nice to pass all down once, and have it done, and get to something else, but not unfrequently such a proceeding results in an ill-posed and ill-proportioned figure, which has to come out after all. At the same time the student must not omit to make many studies in which no blocking is used. For in these the blocking will really be done in the head.

In blocking out the figure (see Fig. 20), the shapes must all correspond as nearly as possible to the final form. Some draughtsmen use straight lines very largely, but it is difficult to see what is gained by an angle where the form requires a curve. One value of angles, however, is the emphasis they give to the breaks in the form.

Then in actually drawing the lines, they may be either placed in the order shown in Fig. 4, A, that is, first the two

FIG. 5.

sides of the arm, then those of the fore-arm, and finally of the hand, or they may be placed as in Fig. 4, B, fixing the outstanding points first. Probably it is best to combine the two, first looking over the ground as in B, and then proceeding in the more structural method A. B is the better as regards proportion, A as regards the organic connection of part to part.

The best method of securing proportion is perhaps to find the centres between noticeable points. Thus in Fig. 5 the draughtsman will see that the centre from the top of the head to the end of the foot is about the centre of the abdomen, as is indicated by dots. Then the height of the line of the thigh from the ground, marked by crosses, repeats at the eye. Then the distance from the seat marked by a ring to the elbow, repeats at the thumb. The same system may be followed down to the smallest detail. Thus, find the centre between the arm-pit and

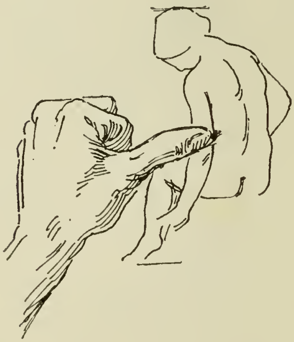

FIG. 6.

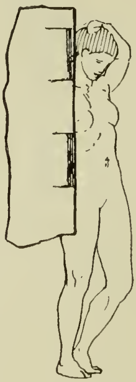

FIG. 7.

the chin, it falls within the arm ; try then to repeat the width of the arm at the arm-pit, up towards the face, the repeat falls at the end of the nose. This system of finding the centres is very valuable in simple drawings, as in the freehand copy at the side of the figure. It is also of great use in drawing drapery and hair, cases in which one is sometimes appalled by the mass of detail. Other examples of proportioning by repeating distances are exemplified in the standing figure (Fig. 5).

It must be understood that these measurements must only be used once, as the living figure is always subject to movement.

In guessing the centre between two points the thumb, finger, or pencil may be held before the model and moved till it is felt to correspond with the true centre, though the first guess should be made with the eyes only. Every measurement taken without previous guessing puts back the progress of the training of one's eye. Nevertheless,

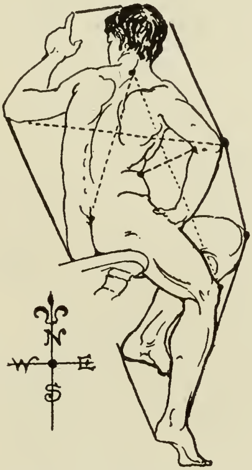

Fig. 8.—Slanting Lines.

when the centre is being found by semi-mechanical means, it is well to have it done accurately, and therefore instead of the clumsy thumb or pencil method, a slip of paper with a few divisions upon it will be found much more reliable and satisfactory (Fig. 7). In taking the size of the head it is customary to take in the hair as well, as it gives a definite limit.

Another way of securing proportion is by taking slanting lines connecting prominent points, as is shown in Fig. 8.

Somewhat in the same way as in the geometrical problem, the angles being equal, the figures are equal. In Fig. 9 two methods of starting are shown. In A the head is drawn first and the forms radiate from it. In B the first line drawn was the slanting line through the elbows to the foot, as base; then the two other sides of the triangle giving the knee. Then one elbow is seen to occupy about the centre of the base-line, which thus becomes divided into two halves. In the left of these the head occurs a little to the outside of the centre. These methods of

FIG. 9.

finding centres and employing slanting lines may be used in drawing from imagination, for it is of very little use one drawing out of one's head if one does not see the figure lying on the paper almost as if it were verily present there. It only needs marking over.

Fig. 10, which was drawn without any pencilling, was drawn in the way just indicated. Dots were first placed at the right side of the thigh, and the left of the nose of the dolphin, then on the hair above the forehead, and so a triangle encompassing the whole was defined by three dots. Then the side of the abdomen near the umbilicus was seen to be about half-way along the base-line, and was fixed also by a dot. From it by slanting lines the arm and breast were reached, and so to the head. Of course it is much easier to do a shaded drawing in this way than one of rigid open lines. Thus the subject

FIG. 10.—Part of a Frieze. (By Clodion.)

becomes a pattern of dark patches, and the process is impressionistic.

The draughtsman must always bear in mind the fact that the figure is a solid. As he draws each part he must remember that there is a part hidden from him as well as a part presented to him. He must endeavour to express the fact that there is air all round the figure, and that it stands free by itself, with a background distant behind it, and space on every side. How to represent this fact is almost beyond telling, but it is probable that whatever the draughtsman holds in his mind will find expression in some mysterious way in his drawing.

FIG. 11.—Employment of rigid outline.

It is a fault, and a grave one, to allow oneself to regard a drawing of the figure as merely an assemblage of lines decoratively arranged, and to forget that a figure should never be drawn but to represent some one, some veritable person, which person will certainly be solid, and have air all around him.

The flowing lines of the outline are, of course, of the greatest importance, but they are not the only exponents of form. Between them there must be an equal suggestion of surface and modelling. In objects having sharply joined surfaces, there are edges or channels which can be legitimately represented by a definite line. Thus in a drawing of a pyramid we have not only the outside lines but a few internal ones which express the intermediate surfaces. In the human figure some of the depressions and prominences are sufficiently sharp to be represented by lines, and if these are expressed a better

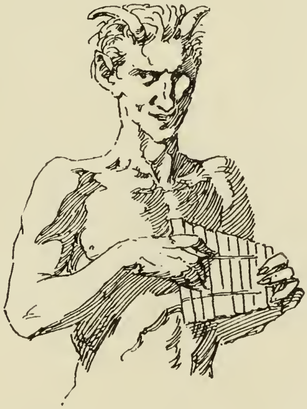

FIG. 12.—Shading kept flat and sharply defined.

idea of the bulk of the figure will be conveyed. Such is the method adopted in the oldest wood-cuts, in *Polyphilus*, for example. There is no shading, and no attempt at making one side of the figure darker than the other. It is true we never see the figure thus, as a network of lines, but we see the facts, and these can be conveyed to our mind by their shape merely.

If shading be added, the simplest kind is that in which the shade is kept in a solid mass unbroken by reflections, as if the object were illuminated by electric light. The edge of the shadow, the shadow line, is very expressive of form. It is in fact the outline as seen from the sun. The mass of the shading might be omitted and the line retained, and this is often done in outline drawings of pictures by old masters. There are many examples in Muntz's *Raphael.*

The effect of reflected light is to neutralize the shadow. In diffused daylight there is, in the open, little or no shadow, the light coming equally from all sides. What is important to notice is, that the reflected light qualifies the shadow unequally. That is to say, it makes the parts upon which it shines most directly, lighter than those which are more remote, so that the shadow is generally darker near its edge toward the light. Thus lines of tone very similar in direction to the shadow lines are formed, which may alone represent the shadows sometimes, and at the same time express the form. They give an effect of sunny brightness. A little of this kind of shading makes a valuable auxiliary to outline. (See Fig. 21, D).

THE FIGURE AS A WHOLE

8. Long Lines of the First Sketch.

THE whole figure is generally sketched in lightly with lines which are at once as simple and as true as possible. Proportion and action can only thus be properly controlled. The simpler and fewer the lines the better, and they will be either angular, straight that is, or curved as occasion requires.

Simplification can, however, be carried too far. In Fig. 13 are given the simplest forms to which the figure can be reduced, and yet suggest the true shape.

The front line of A is the longest of all, and may be used in three-quarter front views of firmly standing figures. The form in B is more serviceable and expressive, as it not only gives the abdominal depression, but carries the thigh to its proper limit at the iliac crest. The lines of the back, and at the back of the leg, cannot be more simplified than here shown. In the female (C) there is a longer and more graceful back-line, but the chest-line is more subdivided. The back of the leg although subtler would be better drawn in separate curves. D illustrates the graceful connection between the lines of the back and front of the leg, by way of the iliac crest.

The long lines down the middle of the back and front become modified as soon as the attitude departs from the erect. That of the back is much the longer, with its extension in the crease between the gluteals usually *at an angle* with the main body of the line. Both the front and the back lines preserve a considerable degree of straightness in the chest.

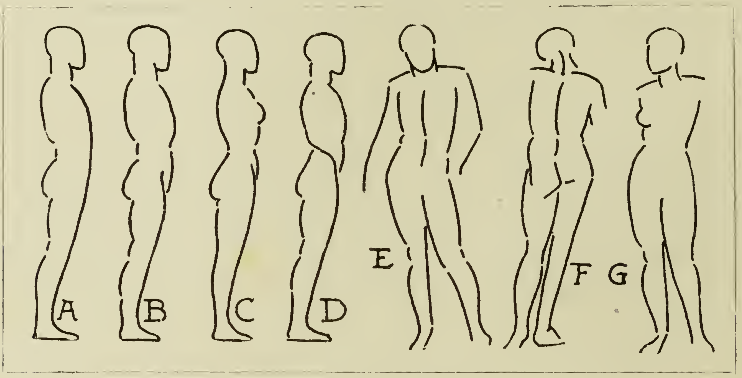

FIG. 13.—Simplest form of the Figure.

The inner line of the leg, front view, may be sketched straight, from the top to just above the ankle, which must project beyond it. The outer line of the leg should however always be doubled. E shows the male, G the female, and the treatment of the hips can thus be compared. The line *must* break at the knee ; there will be a look of bandiness if the line continues from the hip to the ankle. The only instance in which the outer line may be straight is shown in F, and this will not hold good if the figure turns a little and shows the calf, The attitude may of course create long lines, such as are sometimes called decorative; such an one would be the left side of the body of F, but these must be left to the student.

9. Pose and Gesture.

In securing the pose, attention must be given to the large masses of the body falling properly over the point of support. If the figure stands on one leg, it will be found that the hip on the other side sinks, while to balance the loins upon the standing foot, the standing hip will be thrown out. Then, to bring the mass of the chest also over the standing foot, the loins will bend somewhat, while a reverse curve will frequently be upon the neck, to bring the head into the line of gravitation. The slope of the shoulders and hips is therefore contrary. (Fig. 20.) Any arrangement of the limbs, which disturbs this equilibrium, has to be counterbalanced by some other alteration. The change is most noticeable when something heavy is held in one hand. If it be held in the hand on the side of the standing leg, the tendency to pull the figure over on that side will be counteracted by throwing the free leg further out. If, however, the weight be held on the free leg side, the standing hip will be thrown further out. In holding a weight before, the back is bent backward so as to bring the total weight as centrally over the feet as possible. In looking through a window, one leg is generally thrown back to counteract the increased value, as weight, of the upper part of the body, which is thrown forward.

The different angles at which the various sections of the body are placed, must be particularly noted, as is illustrated in Fig. 14.

In all posing, the simplest and most natural attitudes must be selected; no regard for the grace of the figure must be allowed to interfere with the probable aspect of the action. Nor may a figure be placed in any position without some apparent intention in the figure's mind to perform some action, for all posing is simply the arranging of the body in the attitude most suitable for the perform-

FIG. 14.

ance of some action. It will therefore be found, for instance, that when a person looks at an object, he turns his head towards it, and does not merely roll his eyes in its direction. Such only is done when the person wishes to observe without betraying what he is doing by his gesture. Again, when a person uses his hands, except on trivial actions, such as pushing aside a curtain, the body is to be turned towards the action. It is exceedingly ridiculous how often figures are represented writing upon blocks, or reading heavy books—to mention

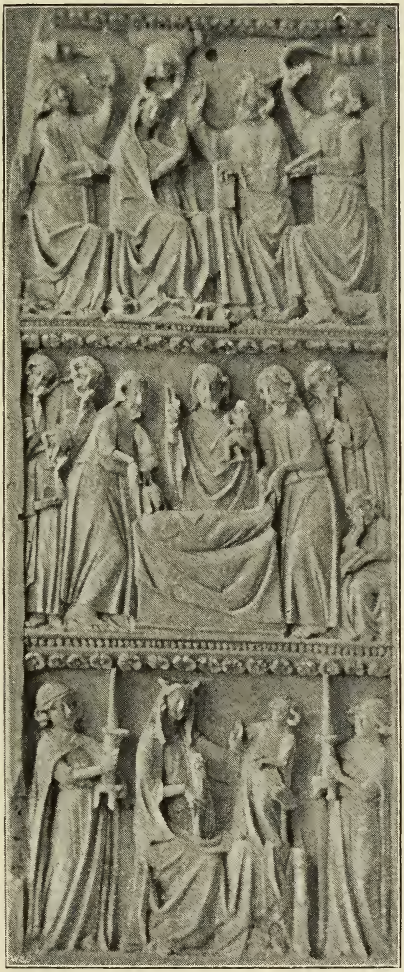

FIG. 15.—Gothic Ivory carving,—fourteenth century.

two only of the most frequent examples—in the most twisted and tortuous positions. Generally there is no reason for them either to read or write; these are occupations given them merely to fill up the space. A designer should never attempt a figure unless he is really interested in people, and takes delight in portraying their habits.

It is rather a sign of a designer's inability when in drawing a composition he puts in the features early; this is chiefly because expression must first come by gesture. If the gesture of the figure does not express the part the figure is playing in the subject, and even its character and disposition, whether of pride, humility, hypocrisy, or any other quality, it is little use relying upon the features; the effect will only be a wax-work. Further, the designer should try to let the whole drama of his subject be explained by the gestures of the figures and composition of the whole. It would be a very good thing if at exhibitions of pictures no titles were declared.

The Gothic designs depended greatly upon the gesture of their figures. Even in Fig. 15, in which there is little call for emphatic statement, the use of gesticulation is discernible.

10. The Effect of Gravitation on the Flesh.

THE falling of the flesh in response to the law of gravitation is most noticeable in the lower limb, if raised when the figure is lying down. The tibia or shin-bone shows up very distinctly, as also does the knee.

In a person seated on a low seat with the knees high, the bones would similarly show. In a figure seated on a seat of ordinary height, which by the way is about eighteen inches, that part of the thigh before the seat droops considerably, especially in the female. In the arm, too, the triceps, or biceps, sink as they happen to be

FIG. 16.—Amorini or Loves. (From engravings after Piazzetta, Venice, 1762.)

underneath, the part above flattening somewhat by falling down the sides.

In old people, whose skin loses its elasticity, there is more drooping observable than in young people. But flabbiness reaches its climax in the drunken Silenus and the infant Bacchus.

In historic art, the falling of the lower parts of the body was admirably represented in the Greek sculpture of the fifth century B.C., the best period. It is excellently shown in the Theseus and Illysus in the British Museum. In the Theseus, in the falling of the flesh beneath the leg and thigh; in the Illysus, in the falling of the abdomen, and consequent accentuation of the thoracic arch. On the Roman stuccoes also the fact is well expressed. It is likewise respected in the Early Renaissance, but from about the time of Raphael the flesh appears more solid and statuesque than formerly, the well-known muscular forms being often added without much regard to change under varying conditions. It is of course only in the work of second-rate men that this peculiarity occurs. In all periods the great men have found truth, the mediocre only form mannerisms. The tightly-drawn flesh of the Renaissance gradually slackened till it became more and more flabby, and as soon as Le Brun had finished his grandiose labours at Versailles, it assumed a looseness unparalleled in art history. Boucher and Fragonard may stand as typical masters of this flabby school. There was of course some good in this loose treatment. It looked soft and fleshy, and these are qualities by no means to be despised, but it was carried too far. With the French Revolution came David, with his revival of the antique, and then there is a return to rigidity, and an almost cast-iron hardness in the early part of this century.

Fig. 17.—Amorini or Loves. (From engravings after Piazzetta, 1762.)

In the drawing of the period when flabbiness was most cultivated (1750), the forms are generally expressed with a sort of wavy line, whereas in the hard times of the Renaissance and early nineteenth century, the curves are almost pure arcs of circles. The happy medium is, I suppose, the best.

11. General Proportions of the Figure.

SOME practical hints upon the proportions of the different members will be found in separate paragraphs, accompanying the parts they treat of. In the present paragraph the proportions of the whole figure are considered.

A number of works on the proportions have been published, the most valuable of which give the results of careful measurement of numerous and typical models, and thus the authors have arrived at various rules. In the best of these works the measurements of the different parts are given in feet and inches, and with the completest accuracy. To the draughtsman these scientific investigations are valuable as wholesome correctives of conventionalisms ; but they are not so useful to him as they might be to the sculptor. The draughtsman delights in foreshortening, which destroys the feet and inches of the scientist.

To the draughtsman the matter of proportions presents itself in two lights—one theoretical, one practical. Knowing two measurements are equal, he can make them appear equal, although both are foreshortened, just as he can make the three sides of a cube appear all exact and equal squares, although not one angle measures ninety degrees. So that it may be a gain to him to know that theoretically this is equal to that, but his powers will be only capable of representing measurements approximately, and not to halves of inches. Then practically he will be interested in any rule of proportion which he can apply rapidly and easily, so that he may be saved from any egregious mistake.

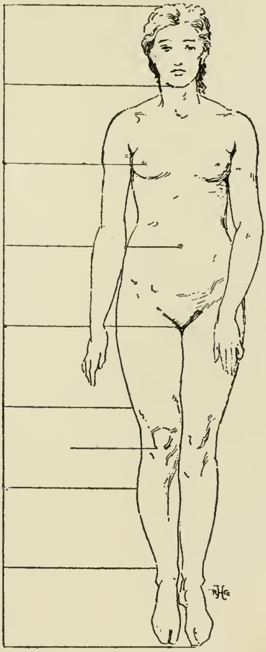

FIG. 18.—The Female Figure divided by eight heads.

According to the conclusions arrived at by the scientific investigators, the division of the whole figure into eight "heads" may be retained if the foot be extended.

Of these eight heads the four uppermost correspond, in the female, to the extremity of the chin, the nipples, the umbilicus, and the absolute end of the trunk. In the male the divisions fall at the extremity of the chin, the lower border of the breast, below the umbilicus, and at the absolute end of the trunk. In the lower limb the heads do not fall at any distinct divisions, unless the widest part of the calf, on the outside, can be considered a sufficiently distinct location for the sixth head.

For further details respecting these scientific measurements the reader must consult the works which specially treat of the subject. It is perhaps more to the present purpose to consider a rule more practical, and to run the risk of its being less scientific.

A rule of proportion to be of value to the draughtsman must follow as nearly as possible the system a draughtsman adopts in securing ordinary proportions. No matter what is being drawn, whether a figure, or a tree, or any other object, he should first fix the greatest dimensions, in all probability the height, or the width. The total size thus determined, the next thing to do will be to find the middle and to fix the nearest definite feature of the object to it. By this means any error in the one half will not affect the other half. Thus with a figure, if the head is drawn first, then the neck, then the body, and so on downward, in all probability the lower part will be too long or too short. This may be partially obviated by finding the middle.

Hence as regards the proportions of the figure, the measurement the draughtsman wants is a middle, as exact as possible, dividing the figure into halves. Next, if possible, he will find a division for each half, preferably at the middle of each, or at the thirds, as being the next easiest to fix rapidly.

It is always easier to compare measurements approaching equality than those that are palpably unequal. Thus, if one line is eight and another nine, it is easy to see, first,

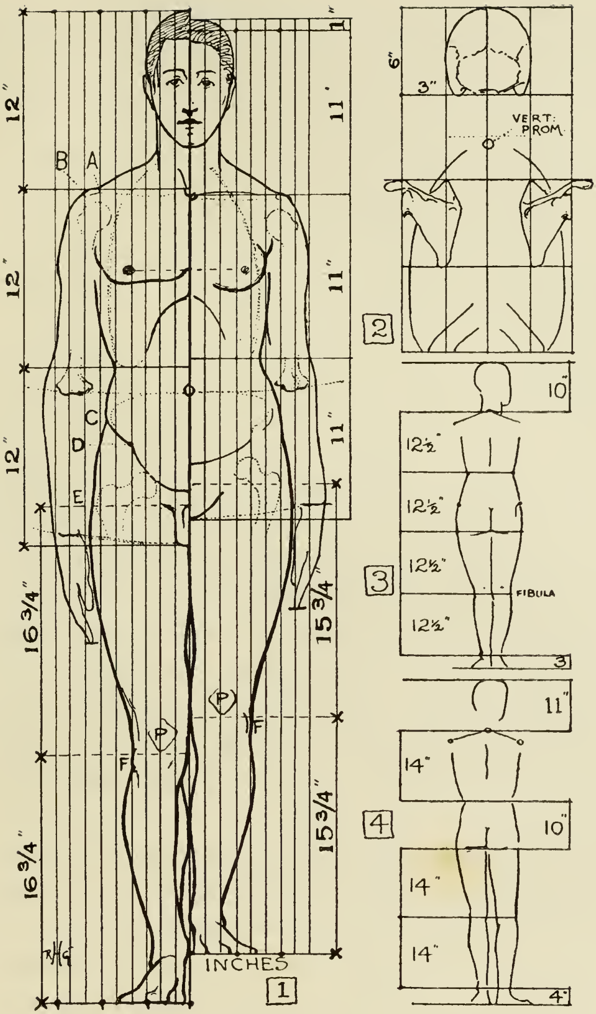

FIG. 19.—(1) The Proportions of the Male and Female, showing the comparative heights, and with the divisions into three zones, and with vertical lines representing inches. (2) Back view of Male Thorax, Scapulæ, and skull, upon horizontal lines six inches apart, and vertical lines three inches apart. (3) Back of Female. (4) Back of Male.

that they are similar in length, and then which is the longer, and by apparently how much. But if one line be three and the other fourteen, and the arithmetical calculation be not employed, it will be difficult to estimate whether the shorter is a quarter or a fifth of the longer It was because of the greater value of halves and quarters, that the artists in the past came to use eight heads for the figure, and made all the parts settle on these divisions, or on the halves or quarters of them.

The centre of the standing figure is agreed by the scientific investigators of the subject to fall at the middle of the lowest part of the trunk, below the groin that is. Taking this level across the hips, it will be seen to arrive at the trochanters of the thigh-bones. In man the bottom of the trochanter, in woman the middle, is on the middle line of the figure. This then determines the centre of the figure, and divides it into trunk and leg.

The lower limb is, taking the total length of the thigh-bone including the ball by which it articulates in the acetabulum, exactly divided into half at the knee-joint. So that from the centre of the figure, or the trochanter, the head of the fibula or bottom of the patella marks the half-way.

Every draughtsman must have felt that the location of the heads, in the system of eight heads, upon the nipples and umbilicus was a defect, practically, in the rule, true as it may be to anatomical fact; because the nipples and umbilicus are not the first things drawn, and a rule to be of practical value must deal with the broad landmarks of the figure. These, in the trunk, are certainly the shoulders and the waist.

It will be found that, according to the measurements given by scientists, the waist and shoulders fall exactly or very nearly at the thirds between the top of the cranium and the lower end of the whole trunk.

This is in man thirty-six inches, and the three divisions thus become twelve inches each; in woman, eleven inches, with an excess of one inch in the uppermost. In man the thorax extends lower down than in woman, but not so much as to materially affect the rule.

In applying the rule, one has, after finding the middle

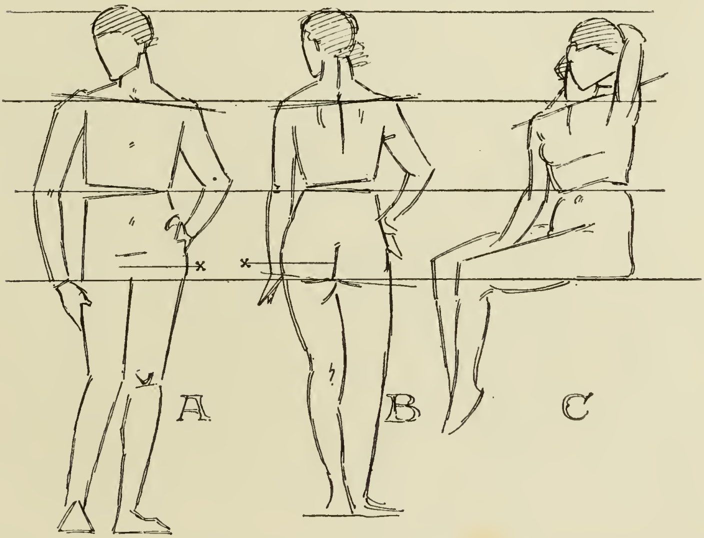

FIG. 20.—The Application of the Rule.

of the figure, to drop the centre a little, before the lowest of the three divisions can be made.

In the back view the rule may be applied by taking the lower border of the gluteal mass as the limit of the lowest third. This gluteal line occurs, however, a little higher in man and lower in woman than the proper end of the third division. But this variation operates rather beneficially, as it tends to keep the shoulders up in man, and down in woman. The gluteal line must be dropped below the centre, as was the last division in the front view.

In the seated pose the seat becomes the lowest line, and thus allows the rule to be applied.

By Fig. 5 it will be seen that the centre of the seated figure is just below the umbilicus.

The proportions are mentioned in detail in the paragraphs devoted to the consideration of the parts themselves. A few remarks in elucidation of Fig. 19 may however be made here. No. 1 shows the two sexes compared half against half, the umbilicus being made to serve as a centre of comparison. Thus the bodies will be seen to be very similar in length, the deep groin in man giving an apparently rather than really greater depth of abdomen. The nipples are on the same line, but the lower border of the breast is lower in woman. The leg of the woman reaches only to the ankle of the man. The widths may be compared by counting the lines which represent one inch each. A is the joint between the collar-bone and the acromion, B; C, the iliac crest; D, the anterior superior spine of same; E, the trochanter of the thigh-bone; F, the head of the fibula, and P, the patella or knee-cap. It will be noticed that the head of the fibula is just beneath the patella. No. 2 shows the well-known recurrence of the measurement of six inches in the back of a man. The measurements would be about five and a half inches in woman. No. 3 shows a remarkable recurrence of a measurement of 12½ inches in the back of a woman; the top division starts at the vertebra prominens; see No. 2 above it. No. 4 shows a similar analysis of a man. In these calculations the height of a man has been considered to be 67 inches; that of a woman, 63 inches.

12. Obliquity of Certain Details of Form.

THERE are innumerable instances in the figure of variety and alternation, and these are exemplified in the direction of the different parts, as well as in the character of their curvature or modelling. The architectural lines, the

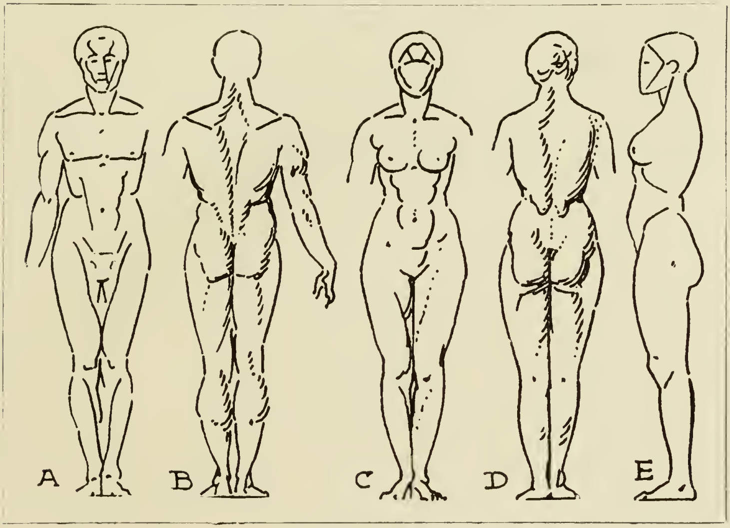

FIG. 21.

vertical and horizontal, only occur definitely, once each : the vertical in the middle line, the horizontal in the collar-bones. The symmetry of the figure also suggests the horizontal, but does not express it ; while even the lower line of the male breast ascends slightly towards the middle line.

In the front view (Fig. 21, A) the number of lines converging downwards is very great. The eminences of the forehead, the cheeks, the neck, the sides of the chest, the abdomen, the outline of the thighs, the sartorial line on the front of the thigh, the outer line of the leg, and the line of the tibialis upon it, all approach the centre line as they descend. In the female (C) the same may be noticed.

The back view presents a more alternating arrangement. The masses converging downwards are those of the back, and of the loins and gluteals. Divergent downwards are the masses of the neck, and of the muscles at the back of the thigh. The male and female may be compared in B and D. The female side view (E) shows how continually the vertical and horizontal directions are avoided. The obliquity of the line of the iliac crest is very important.

THE HEAD AND NECK

13. General Appearance of the Head and Neck.

Full-face or front view.—An oval serves for the first suggestion both of the male and female. The oval is best acorn-shaped, the wider part representing the hair corresponding to the acorn-cup. (Fig. 22.) The lines for the neck commence about half-way down the face-

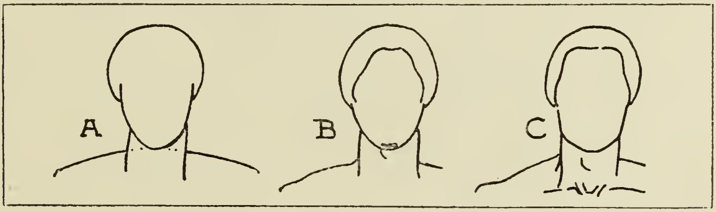

Fig. 22.

line. They should be slightly convex outward, but becoming concave at their lower ends. They should slightly diverge as they descend, and will, moreover, be longer in the female than the male, in consequence of the longer female neck. The neck in the male is sometimes very wide. The shoulder-line is continuous with the curve of the face, as in A, but this coincidence depends upon the pose.

The hair should be divided from the face by the hair-line very early in the drawing; for the length of the face is frequently useful as an index of proportion. The oblique measurement from the chin to the end of the shoulder is about equal to the height of the face. The hair-line denotes very markedly the sex; B is female, C male. The difference is one of width of forehead, making the female ovoid, the male square. This is repeated in the line of the jaw. In the female the jaw-line will include the soft mass of fat beneath the jaw, so that the chin is above this line. The hair-line, as it descends,

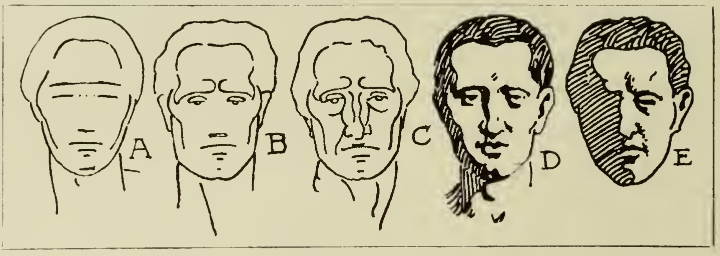

Fig. 23.

curves round the bony mass before the ear. The collar-bone will probably be represented by a slightly undulating curve, which must not, however, reach as far as the shoulder. On either side of the pit of the neck is a sharp tendon, directed towards the ear. Above it the Adam's apple is low in man, high in woman.

Proceeding, it is important that the hair-line should pass round the bone before the ear, and then not down the outline of the face, but down the cheek, vertically in the male (B and C, Fig. 23), or in the customary ovoid manner in the female (A). The features may be suggested by horizontal lines very slightly curved upwards, as in A, These are seven in number, representing—the brows, the eyes, the nose, the opening of the mouth, the lower lip, the top of the chin, and the dimple or perhaps lower limit of the same.

In the male it will be better to express more definitely

FIG. 24.

the modelling of the brow. In B and C it may be seen how the hair-line curves gracefully round the brows, meeting the brow-lines, which at their inner ends mark the bold eminences of the male forehead.

The upper eyelid is more important than the lower (B).

The lower line of the eye-socket is shown in C. In old people it is very marked, but in adult men it helps to give character to the form; as also do the curves on either side of the nose, from the eyes to the wings of that feature.

The lines of brow and cheek, as in B, must receive attention *before* the features. Without them, properly treated, a head cannot be strong. The two shadowed heads (D and E) will assist to explain the form. Note the shadow line of the forehead in E.

The *profile* may be commenced by an irregular oval

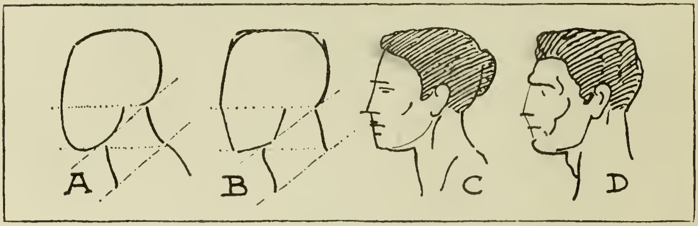

FIG. 25.

(A, Fig. 25) if female, or of a squarer form (B) if male. If a definite profile is required, a point should be given to suggest the nose, as in B; but if it is not yet determined whether the view is to be exactly profile or not, an ovoid form without the point will be best. The neck is suggested by two lines, which in the female are convex forward (A). The relation they bear to one another, in position, is emphasized by the dotted lines in the diagram. The lower end of the back curve is about on a level with the chin; its upper end about level with the nose. The neck must widen as it descends. The front line must have only a little concavity at its lower end in the female, but in the male (B) its curvature must be more pronounced, and its concavity greater. The back line in the male may be straight or convex backwards. The jaw must be kept squarer in the male. In C the female head is carried further. The jaw-line must now lose some of

FIG. 26.

its force, yielding to the drooping line beneath it. This drooping line is of great value in the female head, and must not be omitted from the male, in which, however, the soft fatness it suggests is not so important. The hair-line and ear must next be added, the hair coming down below and before the ear; the ear being nearer the back than the front. The features may be suggested by parallel lines of very slight curvature (C); but in the male (D) it will be better to first model the brow and cheek as shown.

The three-quarter view naturally combines the characteristics of the above two. For a female it may not be ill-commenced with an oval of considerable purity (A, Fig. 27). For a male the form will be best made square, as B. The oval of A is of course only a first form. One peculiarity of the female head is the declivity from

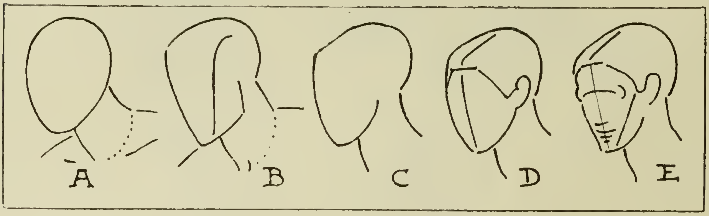

FIG. 27.

the highest part, forward to the face. This gives a straightness to the fore part of the outline of the cranium, and hence the shape C is nearer the proper form than A. The parting of the hair, as in D and E, also assists to fix the sex of the head. And even if the parting is not to be shown, it and a line down the face (D) are very useful as determining the central line of the head, on either side of which the lines of the face and the features can be symmetrically arranged. Neglect of this symmetry is the chief fault of many who draw the figure; and it is certain that till one can render in foreshortening (for a three-quarter head is half of it foreshortened) the symmetrical character of a head, one has not even crossed the threshold of figure-drawing. And of all these symmetrical parts, the hair-line is the first to have right (D); next the brows (as E), noting how they are tucked round to the eyes. Although the strong form here shown is more suitable for a male head, it is well to thus exaggerate this particular part till the form is fairly satisfactory. The outline of the cheek will be best waved slightly; its

FIG. 28.

convexity above, turning in to the eye, will express the cheek-bone and flesh, its concavity will refine the mouth, and its out-turning below will suggest the prominence of the chin. For we must get away as far as possible from the head of turnip shape. The outline of the cheek will be balanced by a line fairly straight, on the other cheek (E), and the two will have to appear symmetrically placed on either side of the centre line.

The three-quarter back view will not be found very difficult if one's drawing be made in accordance with the following facts. The nose will tend to be hidden, and therefore it should be comparatively neglected, and an outline used which does not include it (as A, Fig. 29). This outline is precisely the same as one would ultimately have in a drawing of the three-quarter front view.

The facial outline of our three-quarter back view must tuck in well at the eye. Another fact of the back view is the peculiar shape of the ear, which must be kept nearer the facial outline than the other. Then the jaw-line will

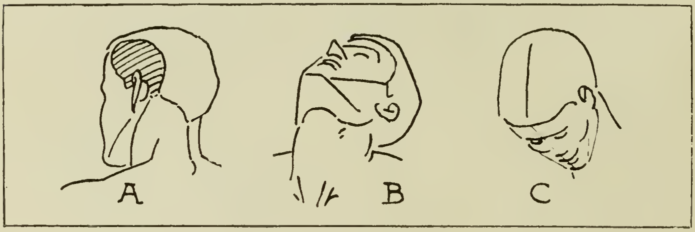

Fig. 29.

tend to become convex upward, and the line of junction between the neck and jaw will become prominent. The central depression at the back of the neck will be important, as will also be the shape of the hair-line, and the position of the flat "side" of the head, which is shaded in the diagram.

For a *foreshortened* view (as B, Fig. 29), it will be best to draw the jaw-line first, then the upper limit of the throat. The chin, mouth, and nose may be suggested by short strong curves, as also may the eye, but the line upon which the eyes are, and the brow-line, must not themselves curve very much. In such a view as C, the parting of the hair should be placed first, and boldly, then the hair-line curving *downwards.* The small lines of the face will also curve downwards, and, as before, the brow-line will be less curved than the eyes or mouth.

The further progress of the head requires a knowledge of form, to the detailed consideration of which the succeeding paragraphs are devoted.

14. The Proportions of the Head.

THE head, as a mass, falls in profile into a square of 9-inch sides for a man, and $8\frac{1}{2}$-inch sides for a woman,

FIG. 30.—The Head in a Square.

the hair being omitted. (Fig. 30.) This proportion is, however, not of very much use, since while it is easy enough to recognize the height of the face, it is not so easy to recognize the height of the head, because the level of the chin has to be carried in imagination backward till it falls under the highest point of the top of the head, and similarly the width is not easily recognized because the square is reached by the projection of the nose, whereas one would more naturally omit the nose in considering the width (front to back measurement, that is) of the head. Moreover, comparing measurements is far more safely performed if the two dimensions meet at a common point, as do the two lines of the letter L, and not when they are placed cross-wise as in the letter T. Thus, in all proportionings it will be best to find out those which have one common end-point. The head consists of the face and the cranium, and the important measurements are the length of the face and the projection backwards of the cranium. The length of the face is in man $7\frac{1}{2}$ inches, and the cranium from just above the eyebrows to the widest part behind about 8 inches. But if the top of the face—the limit upwards of the $7\frac{1}{2}$ inches—be taken as a centre of two dimensions,

FIG. 31.—The Proportion of the Face to the Head.

one going to the chin and giving the facial length, and the other to the back of the head, as shown by the crosses in Fig. 31, A, then these two dimensions will be found to be about equal. It must be noticed that the angle enclosed by the two lines is less than a right angle, the triangle approaching the equilateral.

Or the matter may be regarded from the basis of the hair-line. In men the hair-line diverges far over the temples; but in women, owing in a great measure to their method of dressing the hair, the line is more direct. (Fig. 31, C.) For practical purposes it may be said to pass from the top of the face to the middle or bottom of the ear. On either side of this line, as at B, the face and the cranium lie in about equal masses. This is seen better in F, where the mass of the face is traced down in the space of the cranium. It will be seen that the chin falls at the proper place at the back of the head. More head has to be added above; but what is required of the rule is the width backward, rather than the height, and this is obtained. D and E are heads from Greek vases of the best period. The hair is worn very low on the forehead, but the massing can be estimated. The ears are remarkably short. It may be remarked that when a head appears in a drawing too large or too small, it is more probably the face that is wrong.

15. Proportions of the Face.

EXCLUDING the hair, the face is divisible into three equal divisions, falling between the eyebrows and the eyes, at the tip of the nose and the end of the chin, while the eye is placed at the half-way between the extreme top and bottom of the head, when it is held in the normal upright position. (Fig. 32.) The mouth falls a third of the way down the lowest division.

In starting a head, it will be found best to first draw the full mass, and then to separate the face from the cranium, or, broadly speaking, put in the hair. If the hair is not falling low on the forehead, the hair-limit, or top of the forehead, can be used, and in this case the proportions of the face will be best secured by the placing of the eyebrows and the nose according to the fact of the three equal divisions, as in Fig. 33, A. If, however, the hair falls over the forehead and hides the upper limit, it is perhaps best to place the eye first, half-way down the whole head, then to add the eyebrows above them, then the nostrils half-way between the brows and the chin, as in Fig. 33, B. The same means can be adopted

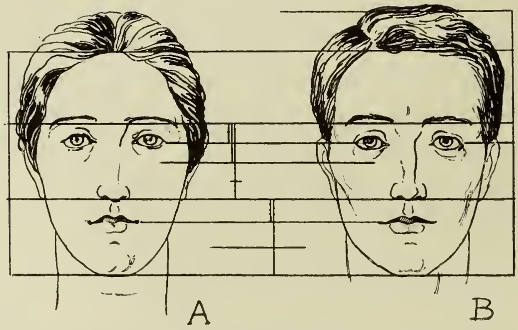

FIG. 32.—The Proportions of the Face.

for foreshortened faces; but with those there is, as is only to be expected, far greater chance of going wrong.

Of the more detailed proportions the following may

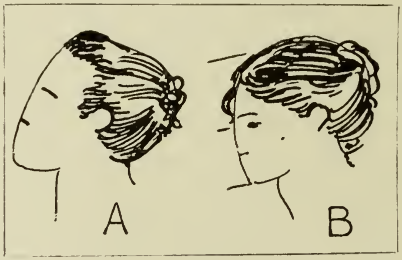

FIG. 33.

be of service. First, the lower eyelid is seldom lower than half-way between the eyebrow and the top of the wing of the nose. (Fig. 34, A.) The height of the brows above the eyes varies considerably. Thus, there are beetle brows, and the reverse, and therefore the brow-line must perhaps not be regarded as having the fixity of a bony prominence. It is chiefly in the faces of women that the space between the eye and the brow is of any extent; frequently in men it is almost hidden by the overhanging brow. B illustrates how the line from the eye to the wing of the nose is not parallel to

FIG. 34.

the line of the nose, but slightly convergent upwards. A similar convergence downward is seen in the case of the mouth, as at C. In Greek heads the nose, being higher at the root, allows the line from the eye to be parallel to it. The convergence downward in C applies

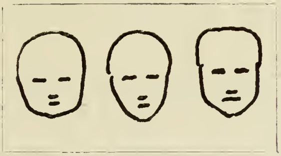

FIG. 35.

only to views nearly or quite in profile. By D it will be seen that by joining the outer corners of the eyes to the tip of the nose, a right-angled triangle is formed. E demonstrates how the distance from the corner of the eye to the front of the ear, is the same as from the corner of the eye to the corner of the mouth. This applies particularly to heads of women, in men the ear is a little further back.

As to the relative widths of the eyes, nose, and mouth, some elucidation is afforded by the fact of the figures of women possessing a slight similarity to those of children, whereas the figures of men get beyond the stage at which these stop in their development, and so acquire the masculine characteristics.

The space between the eyes in men, women, and children is the same, namely, the width of one of the eyes; therefore in this one particular the three are alike. But if the length of the nose, and the width of the nose and mouth, are taken into consideration, the result is an appearance of greater size in the eyes of women and children, or less in the mouths and noses. The widening, in men, of the nose and mouth, seems to throw the eyes nearer together, an effect which is further assisted by the greater width of the nose generally, from the root downwards. The width across the wings of the nose in men is equal to, or greater than, the width of an eye; in women it is slightly less, in children less still. The mouth is much larger in men than women, and smallest in children.

Very frequently the lowest third in the face of a man appears much longer than the nose portion. This is often to be seen in photographic portraits.

16. The Form of the Cranium.

THE face is properly that part below the brows and before the ears. All else is cranium. In studying the form of the different parts of the body, it is well to err rather on the side of the polygonal than on that of spherical or cylindrical roundness. There is a degree of the polygonal and of the round in all the forms, but the ridge and edge, which produce the polygonal, are less readily grasped by the uninitiated, and are more important in actual use.

In considering the cranium, although its fundamental shape is ovoid, it is modified by certain peculiarities, which in the heads of men have so great an effect, as to some extent to substitute a polygonal form for the ovoid.

Taking a side view of the cranium, the oval will require

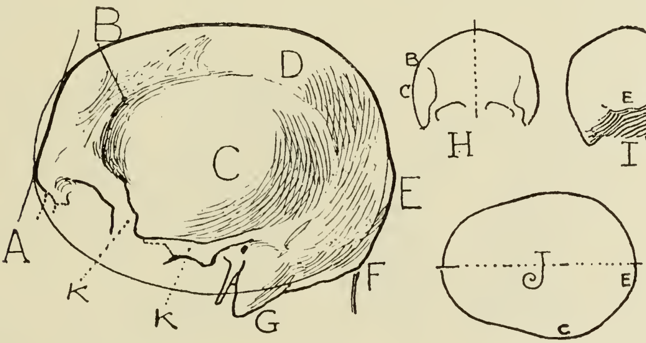

FIG. 36.

to be smaller at the face end, the front. Modifying this oval to agree with the actual shape, the first change will be to flatten the forehead by the line A in Fig. 36. Then it is quite possible that the vault of the cranium, traced backward, may keep to the oval, till at the back it suddenly bulges out at the occipital protuberance E, and at the occipital spine F, where the neck begins. From F to G (the mastoid process) is the line of the junction of the neck with the skull, the space underneath between the two mastoids (G) and the occipital spine (F) being the *base* of the skull, or rather, the hinder part of it.

The most important line in the cranium is the temporal curved line B; it rises over the outer end of the brow, and traverses the side of the head, in a path almost parallel to the outline of the vault. There are of course two of these temporal curved lines, and they to some extent *flatten* the sides of the head. The flattening is palpable just above the brow, in the temple that is, but gradually diminishes as it proceeds backward. It is generally evident in men as far as the dot of reference, B. The flatness of the side of the head is somewhat assisted by the parietal eminences D. By placing one's palm on one's head, one may readily feel that the head is slightly flatter at D, than in the region just before it.

The oval space in which the letter C is placed is the temporal fossa or hollow; it is bounded by the *curved line* B. It becomes a hollow by being walled about by the bony prominences K, otherwise it is rather a mound than a hollow, providing in fact the greatest width of the cranium —six to six and a half inches.

The front and back elevations shown at H and I exhibit the varied extent to which the characteristics that have been referred to influence the form; the example I is very much more angular or pentagonal. At J are tracings from two skulls, cut through at the greatest length horizontally. It will be seen how very much purer the oval is in the upper one. In the lower one will be seen the prominence of the bulging at C, with the hollowing of the temples to the left of it, while the slight extent laterally of the occipital protuberance E will be noted, a fact which is expressed by the shading in I.

The vault, as seen in side view, has often an undulating outline similar to the upper curve of J.

17. The General Form of the Face.

THE face may be said, if the nose be omitted, to be made up of three broad and general surfaces, placed somewhat at right angles to one another, and forming the two sides of the cheeks, and the front or face proper. The junction of the side with the front is of course not a sharp or clear line, but may very well be represented by the shadow line, which often falls down the cheek, and

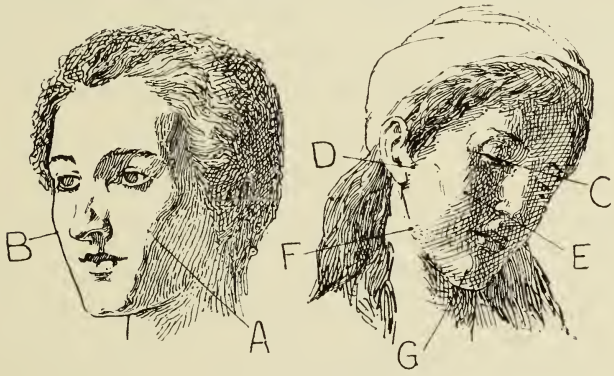

FIG. 37.

which corresponds with the outline B, Fig. 37. Between these two lines is the central or facial surface, an inverted triangle with its base across the eyes, and its apex at the chin. This surface is convex; that is, the central part supporting the nose and mouth is higher than the borders.

Further, it must be noticed that this surface is not continuous with the forehead, but is set back under the brows, the eyes projecting above or upon it, somewhat in the same way as the nose.

The side surfaces are also triangles having their apices at the chin. But the triangular form is disturbed by the projection of the cheek-bone, E, and the angle of the jaw, F. If the widths of the head at the points C, D, E, and F be taken, they will be found to be not very different. D is the greatest, then follow C, F, and E in order, E being the smallest. The result of the similarity of distance is to make the four-sided space C, D, E, F, almost flat laterally, though it really looks somewhat forward and downward. E F thus becomes the base of a small triangle, E F G, completing the side of the face at the chin. It runs inward, since the chin is much narrower than the cheek. Owing to this obliquity it frequently takes a tone deeper or lighter, according to the position of the luminary, than the quadrilateral C D E F.

18. The Zygomatic Arch.

THIS is a bony connection between the malar, or cheek-bone, and the temporal, or bone of the ear. It is narrow, but wider at the cheek end, flattening out there, and prolonging the flat surface of the malar bone which plays so important a part in the appearance of the side of the face. It must be noticed that the zygoma runs horizontally backwards, on the level of the lower edge of the eye-socket. Passing as it does over the orifice of the ear (C, Fig. 38), it is suggestive of the fastenings of spectacles, which indeed lie as much on the mass produced by the zygoma as upon the ear. The thong of the spectacles is, however, a little higher than the bone of the zygoma. The sharp angle A must also be noticed; the bones forming it stand about an inch away from the body of the skull, and are not rounded to any extent, being very thin. The sharpness producing this edge is very evident in old people;

even in well-fleshed subjects this part *looks* hard and bony ; in children particularly so. It is one of the hardest problems in figure drawing, to give a bony look to a part that is not definitely angular ; there is of course a similar

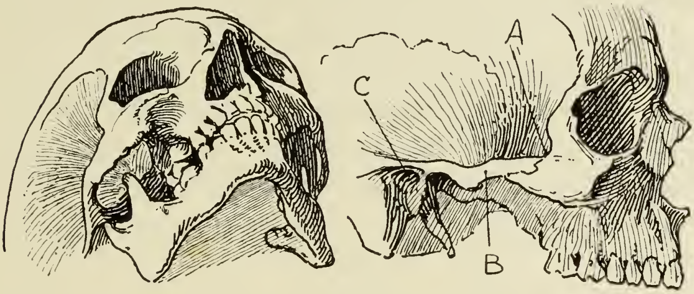

FIG. 38.—The Zygoma.

difficulty in making the lymphatic parts look tender and easily pressed.

It must be observed that this zygoma prevents the

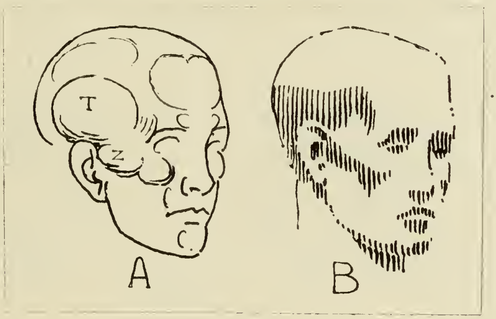

FIG. 39.

hollow of the temple joining the hollow of the cheek. The most important fact connected with it is, however, its prominence. Viewed from above it presents the appearance of a gently curving arc—an arc of a large circle. It is highest at its thinnest part (Fig. 38, B), about half-way between the orifice of the ear and the eye-socket. The face is widest therefore a little before the ear, so that the width *at* the ear is only a very little greater than the width at the cheek-bones.

The effect on the form is first to add a mass between that of the cheek-bone and the temporal prominence, and just before the ear, as in A, Fig. 39. This addition receives light and throws shadow, the light slanting up into the temple, the shadow down into the hollow of the cheek, as in B.

19. Comparison of the Forms of the Head in the Two Sexes.

THE dimensions of the male and female heads are virtually the same, but this is more because the measure-

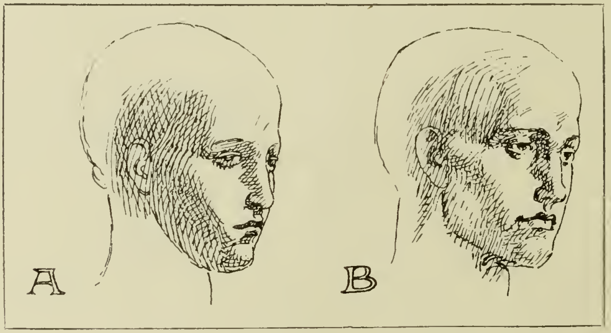

FIG. 40.—Comparison between the Forms of the Head in the Two Sexes.

ments which are taken do not affect those parts in which differences occur, than because the heads are similar.

Thus allowing the height to be comparatively the same in both, it is in woman further back, or, in other words, the frontal bone does not rise so high as in man. (Fig. 40, A and B.)

The chin occupies the same position in both, but the angle of the jaw is in a woman much less pronounced than in a man. Moreover, the distance from angle to angle across the throat is less, from cheek-bone to cheek-bone is less, and from zygoma to zygoma is less. The cheek-bones are less prominent forwards, and are, so to

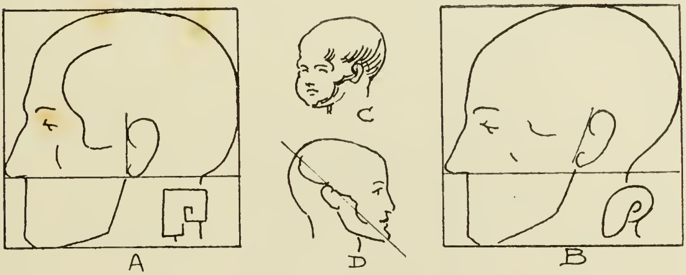

FIG. 41.—The ovoid and oblique character of the Female Head, contrasted with the squareness of the Male.

speak, further behind the chin. Thus the chin becomes more pointed, the fleshy line from the cheek-bone to the chin assumes a little more importance by the retiring of the angle of the jaw, and so the face becomes rounder and smaller. The same falling back is noticeable, as has been pointed out, in the fore part of the cranium.

The result of these differences is to flatten the female head in the region of the ear, and also to soften the general form, and to emphasize that obliquity, which is so typical of both the cranium and face of a woman.

The head of a man is squarer, and its parts project more definitely. The forehead is higher, the zygoma, cheek-and chin-bones are more prominent, and the angle of the jaw more pronounced and squarer. The front of the face at the mouth may be said to be flatter.

20. The Bony Structure of the Face.

THE body of the lower jaw, or inferior maxillary, lies somewhat horizontally, and has two ascending ramuses, rising to the sockets beneath the zygomas, and thus forming the hinge of the jaw. Upon the teeth of the lower jaw rest those of the two upper jaw-bones, or superior maxillaries. These superior maxillaries reach as high up as the inner corners of the eye-sockets, providing also the sides of the nose, and sending out on the outer sides brackets, upon which rest the malar or cheek-bones. These malar bones are roughly star-shaped, four-pointed. One point stretches towards the nose, and forms the outer side of the lower border of the eye-socket, one proceeds vertically upward, and forms the outer border of the socket, another proceeds backward and becomes a bracket to support the zygoma, while the last is less pointed, and falling vertically downward makes the lower border of the cheek-bone. The nasal bones are very small, and start from the internal angular process of the frontal bone, between the eyes, and project just so far as to make the bridge of the nose. The rest of the shape of the nose is built up of cartilage, or gristle. The frontal bone, or bone of the forehead, caps the whole face; it provides the upper borders of the eye-sockets, and by its external angular processes forms part of their outer, and by its internal angular processes part of their inner, borders, and the root of the nose.

Viewing the bony structure of the face as a whole, the first thing to notice is, that the fore part of the upper and lower jaws presents a surface almost at right angles with their side parts. The division is observable in Fig. 42 as an outline on the left side, and a shadow line on the right, being slightly curved outward, and suggestive of a line from the root of the nose to the eminence of the chin. The front surface of the jaws is not flat, but slightly convex; the eye-teeth, answering to the fangs in beasts, however

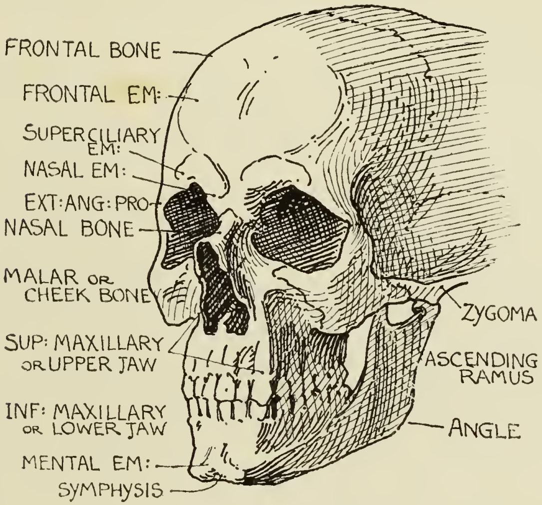

Fig. 42.—The Bones of the Face.

assist the idea of the angularity of the jaw in the region of the teeth. The next noticeable fact is that of the almost equal prominence of the lower border of the eye-socket. Just as the jaw surface already spoken of proceeds from the nose downwards, so there is a ridge passing from the nose to either side, and forming a very prominent lower border to the eye-socket. From this ridge the parts of the upper jaw-bones, and of the cheek-bones, which are below it, fall back more or less; less in the case of the cheek-bone, more in the case of the upper jaw-bone. The hollow thus formed is continuous with the flanking back of the back teeth. Broadly speaking, it may be said that the prominences of the bones of the face, viewed from before, are in the shape of a T.

Below and above the teeth there is a distinct sinking; thus at the bottom of the nose the bone lies further back than the teeth. And similarly there is a depression, between the lower front teeth and the eminence of the chin.

The lower jaw-bone is originally a double bone like the upper jaw; the point of conjunction, or fusion, is the symphysis of the chin, which occurs exactly in the centre. At the lower end of the symphysis or central joint there is a slight notch, which throws into prominence the mental (mens, the chin) eminences, which meet on the symphysis a little above the notch. The under border of the jaw is not a straight edge from the angle to the point of the chin, though it is somewhat of one.

From the symphysis to a point just below the last teeth, the outline is a gentle curve continuous with the outline of the "ascending ramus." So that the "angle" is, as it were, an addition; or, in other words, there is a slight depression above and below the angle. This is a matter of considerable importance.

The lower border of the jaw which has just been spoken of, as far, that is, as from the symphysis to and including the angle, is fairly evident in the final form, as also are the frontal, superciliary, and nasal eminences of the forehead. To the characteristics which these supply, attention will be further directed after the muscles of the face have been briefly named.

21. The Muscles of the Face.

It will be seen by the diagram, Fig. 43, that in the face there are three muscles of circular form, and called therefore *orbicularis.* They close the eyelids and the mouth, and their names consequently are the two *orbiculares palpebrarum* and *orbicularis oris.* Their similarity of shape affords a good starting-point in the consideration of the

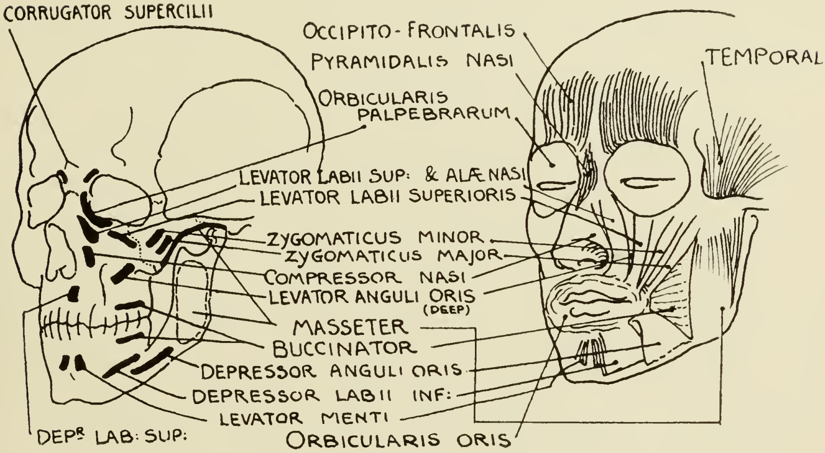

Fig. 43.—The Muscles of the Face.

muscles of the face. But while their shape and functions are similar, there is between them a marked difference, in the fact of the *orbicularis oris* being the centre for almost all the other muscles of the face, while *orbicularis palpebrarum*, or muscle of the eyelids, has hardly any round it, and those of little importance. They are, however, the *pyramidalis nasi* and *occipito-frontalis*, the former an extension of the latter, and both concerned in wrinkling the skin—the *pyramidalis*, that of the nose; the *occipito-frontalis*, that of the forehead.

Generally a muscle passes from one bone to another bone, the connection with the bone being a tendon, sometimes long and sometimes short. There are many cases in which instead of attaching to bone they attach to tendinous sheaths, to ligaments and similar non-bony parts. The orbicularis oris provides a number of these cases; the muscles which pull the mouth up, down, or backward—to briefly summarize their functions—arise from bone, but find their insertions in and among the fibres of the orbicularis oris. Hence it is that almost all the muscles of the face have only one location in the bones. The orbicularis oris itself has no bony connection, and it is the recipient of the ends of some nine others, which have one end attached to bone. Reading from the nose, there are the elevator of the upper lip and also of the wing of the nose (*Lev. lab. sups. et alæ nasi*); the proper elevator of the upper lip (*Lev. lab. sup.*). Beneath these the elevator of the angle of the mouth (*Lev. ang. oris*). Then the zygomaticus major and minor, arising as they do from the cheek-bone near the zygomatic process. These are opposed below by the depressor of the angle of the mouth (*Dep. ang. oris*), the depressor of the lower lip (*Dep. lab. inf.*), and the elevator of the chin (*Lev. menti*), which being also a depressor of the lower lip, corresponds with the depressor of the upper lip (*Dep. lab. sup.*), situated under the nose.

The list of muscles round the mouth is completed by the buccinator or cheek muscle, the most artistic use of which is made by the trumpeter. The inflation of the lips is due to the lungs, but the buccinator compresses the space within the mouth, and forces the breath rapidly through the constricted lips. Attached as it is to the corner of the mouth, its action produces a dimpling there, as well as a puckering of the cheek just behind the corner.

The effect upon the face of the muscles will be treated in the next paragraph. It is only necessary therefore to name the *compressor nasi*, which compresses the nose as in smelling, and the *dilator nasi*, which lies upon and expands the wing of the nose.

The *masseter*, or masticatory muscle, is one of a pair which in conjunction with the *temporales* performs that office. The *temporalis* rises in the broad space known as the temporal fossa, which is bounded by the temporal curved line. (Figs. 43 and 36, B.) It is gathered together into a fan shape and passes under the zygoma, to be inserted in the *inner side* of the ramus of the lower jaw. The *masseter* arises from the edge of the cheek-bone and zygoma, and attaches to the *outer side* of the ramus.

22. The Effect of the Bones and Muscles on the Face.

Leaving many matters of detail and of sculptural quality to the succeeding paragraphs on the different features, there are a number of peculiarities of the form of the face, arising from both bony and muscular structure, which are of the first importance to the draughtsman.

The frontal eminences (A, Fig. 44) give the full roundness to the forehead. They are separated by a very slight hollow, which continues to the root of the nose. Just above the nose on the brow are the nasal eminences B, with the superciliary eminences C, close by. These nasal and superciliary eminences are much more developed in man than in woman, and therefore assist in determining the appearance of sex in the head. In men a line, U, is generally traceable over the superciliary and nasal eminences. It is shown also in Fig. 45. These eminences of the forehead form a sort of front to it, bounded by the line D, which becomes a shadow line when the light favours it. It will be seen in the paragraph upon the eye and its surroundings, that there is a sort of corner in the brow, in

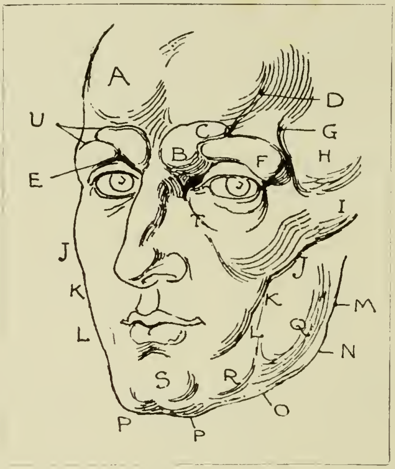

FIG. 44.

Fig. 44, marked E. It is the junction between certain masses, or forms, of which the superciliary and nasal eminences form one, and the mass which covers the eye on the outer side (F) is another. This latter mass is made up of the external angular process, covered and thickened by the orbicularis palpebrarum muscle. Close behind this is the temporal curved line starting upward (G), and surrounding within the temporal fossa, the temporal mound covered by the temporal muscle, and making a low but important projection above the ear (H). Below this is the zygoma, I, receiving light in all probability.

From the under side of the zygoma starts a line, which divides the face from the cheek, and runs down to the chin. This is a most important line, since it expresses the modelling of the face. Its counterpart is the outline of the other side. Following this line down there is first the curve for the cheek-bone J, then the curve formed by the muscles of the cheek, edged by the zygomaticus major (K). Next comes a curve formed by the orbicularis oris

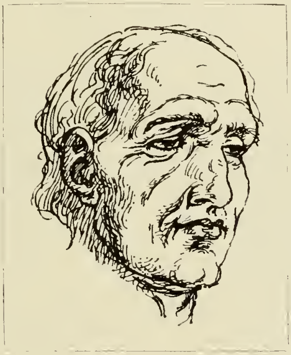

FIG. 45.

(L), while the line dies away around the lower border of the mass to which that muscle may give its name.

The shape of the jaw is pretty well expressed by the ramus (M), the angle (N), the curve (O), and the corners (P P).

Upon the jaw the masseter muscle lies, slanting backward with a fairly strong border, in the hollow of the cheek, Q. Below is the mass of the depressors (R). The mass or masses of the chin (S) are some little distance above the outline. Below all these will be noticed a narrow space, just on the outline of the jaw before the muscles are reached. The skin and the fat beneath it of course blend together all these forms, and obscure them more or less, particularly in women.

In heavily-fleshed faces, as in those of hale old men, such as Sir John Gilbert's well-known patriarchs, the looser skin with its weight of fat modifies the form considerably. The folds of the skin itself dominate the form beneath the eyes, and beside the nose and mouth. When these folds are very long, they pass down the cheek and turn under the jaw. Such would be the next stage after that shown in Fig. 45. There will be noticed a fleshy mass on the lower part of the cheek, a sort of combination of the masses Q and R, in Fig. 44, which folds round under the jaw to the mass beneath the chin. The angle of the jaw generally retains its expression. In persons of all ages there is a degree of this folding round the mass of the cheek to the throat, over and softening the curve O, of the jaw.

23. The Eye and its Neighbourhood.

The orbit, or eye-socket, is obliquely placed; somewhat rectangular in shape, it has its inner end the higher. The downward slant of its lower and upper borders gives to the skeleton that expression of grim misery which is so characteristic of it.

The borders of the orbit had better be noticed in detail. The diagram represents the complete fleshed eye, with however the eyebrow omitted; also the same view of the bony orbit. The first detail to call attention to is the notch in the upper border, marked A in both figures. To the left of this notch is the external angular process which is enlarged by the orbicularis palpebrarum muscle. In both figures this mass is marked B. In both, the temporal curved line is visible (C)—sharper in the skeleton—where also the descending external angular process (B) seems tolerably continuous with the cheek-bone and its ascending process, D; but in the living model there is a great degree of separation. Thus the mass B often takes shade, whereas the mass D, which continues along the zygoma, takes light. Indeed the surface B seems to plunge more or less into the head downwards, and

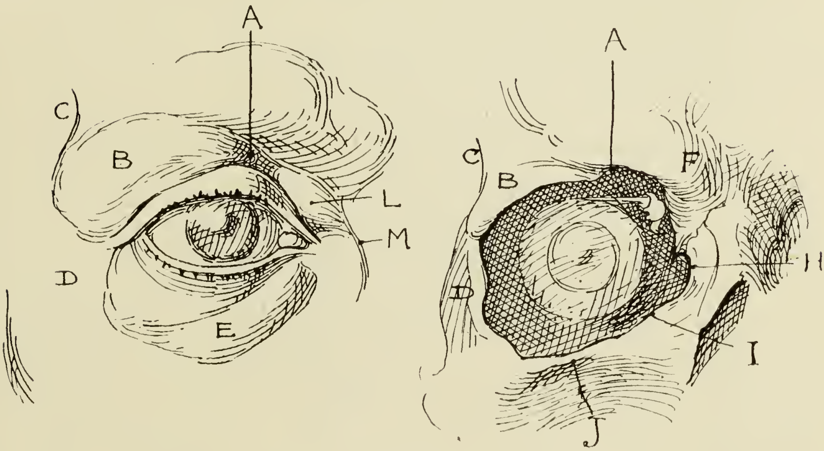

FIG. 46.

the surface D seems also to plunge into the head upwards. There is of course no sharp division between the two.

The obliquity of the orbit greatly modifies the extent and shape of the lids. Each lid is fuller, or shows more, where it has most room. Thus the upper lid is seen at its fullest just below the notch A, while the lower is wider at the outer side. For the edges of the lids, where they meet when closed, are not oblique as are the borders of the orbit, but horizontal.

In old people the tear-pouch, E, becomes very marked, and in them the shape of the bone is more plainly seen than in young people. The smoothest part of the border of the orbit is beneath the nasal eminence, F, and is indicated by shading on the skeleton. It forms a kind of entrance to the hollow of the orbit, and is well known to modellers.

The nasal bones also provide a very smooth declivity into the orbit, although the edge, H, is sharp in the skull. Hence in old people the border of the piece, I, shows very plainly. This part will be seen to be an expansion from the narrow ridge, J, towards the nose. This expansion is very important. Being bone it does not waste, and consequently takes light in persons of all ages. Below J the surface of the maxillary bone runs backwards at a gentle angle. It is this hollowing which, throwing up the ridge J, assists the ghastliness of emaciated faces.

One very important detail of the eye is the surface L. It occurs to the inner side of the notch in the upper border, and is in form oval or almond-shaped, and placed obliquely. It terminates in a blue vein-line, M. This small surface occurs over a trochlea or pulley, through which one of the muscles of the eye operates. The position of the trochlea is shown in the anatomical diagram.

It has been said by Mr. Holman Hunt that there are no concavities in the body. There is generally a little bumping up in the depth of such whenever they occur, and this surface L is a case in point.

The upper lid is very palpably connected at its inner end by the short *white tendon* of the eyelids. (Fig. 47, A.) This tendon leads to the border of the orbit, and is the start-point for a number of minor lines. There is a slight string observable, when the eyebrows are raised, running upward from the nose-end of this white tendon, B. To the side of this string is a slight hollow, C, against the nose, down which one may notice the blue line of a vein, contrasting with the yellow of the white tendon. Between the string B and the upper lid is another hollow, in the upper part of which the surface L of Fig. 46 mounts up. The white tendon keeps a markedly straight course to the upper lid, which fits into it, while beneath it there is a

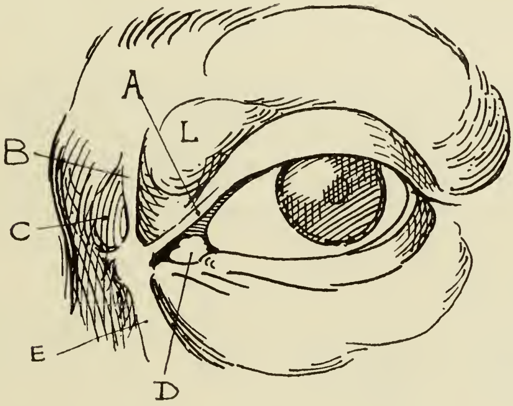

FIG. 47.

membraneous connection with the ball of the eye, so that the white tendon is somewhat higher than the hollow of the inner corner of the eye, in which occurs the *caruncle* or lachrymal wart D. The lower lid may be said to really start just to the other side of this wart, its connection towards the nose getting out of the way as it were of that fleshy speck. The under line of the lower lid is somewhat broken by reason of its skinny connection with the cheek. Below, the white tendon supports the skin of that part of the face between the eye and nose, as is shown at E. At the outer end of the eye the upper lid, only, continues by a tendon or string towards the

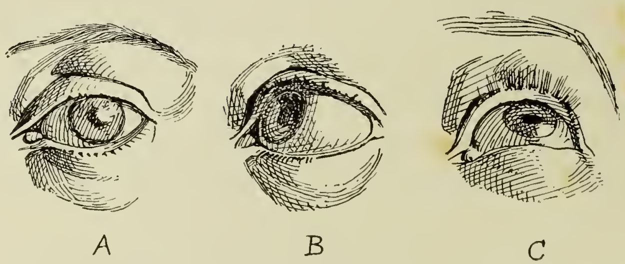

FIG. 48.

zygoma, the under lid curving very rapidly upward, and meeting the upper at about a right angle.

The iris is generally covered at its upper part; indeed it takes a very wide stare to completely show it. But on the

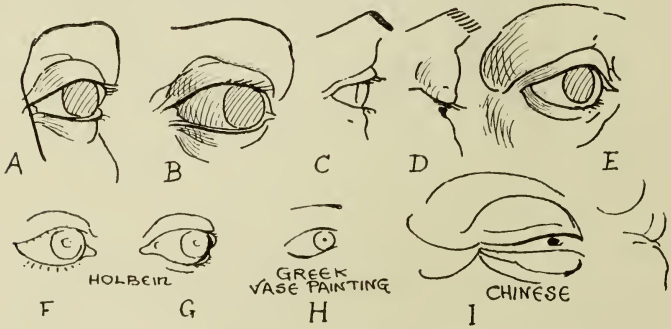

FIG. 49.

other hand, it is not at all uncommon for the white to show all along beneath the iris.

The edge of each eyelid is square in section, as if it were edged with square wire, so that, when the eyes close, the lids touch by narrow flat surfaces, which are fairly well seen in the diagrams. This square edge stops abruptly at the corners of the eye.

By the illustrations it will be seen that the forms are by no means simple, or the curves pure arcs. The chief peculiarities may be briefly enumerated. In Fig. 48, B, the ovoid form, and the membrane at the outer corner, and also the position of the pupil *not* in the middle of the iris. In C, the irregularity of the lower lid. In Fig. 49, A and B, a second fold to the upper lid. In C and D the double curvative of the upper lid.

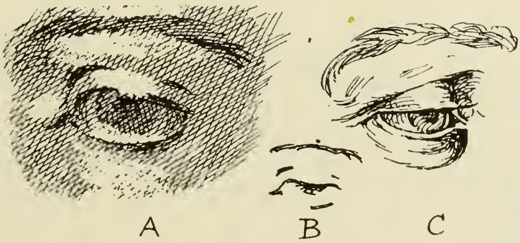

Fig. 50.

The cornea, or lens over the iris, is a bulging mass upon, and in excess of, the eyeball itself. It raises the lid a little beyond its ordinary projection, sufficiently generally to catch a little more light, as in Fig. 50, in which also are shown the two dark specks representing the upper border of the upper lid, which is partly hidden by the brow drooping upon it. In old people the drooping brow and spherical eyelid contrast very sharply, as in C.

The lashes have the effect of darkening the edges of the lids, more particularly in the outer two-thirds. The upper lid and lashes throw a degree of shade upon the eyeball; but often at the projection caused by the cornea, the tops of the lashes take light, which thus encroaches upon the iris, as shown in the left eye in Fig. 50. In a similar way the edge of the lower lid catches the light, and reflects a little on to the ball.

It is possible to represent many more of these subtleties than the English draughtsman usually attempts. The French have long done so. The middle eye above illustrates the treatment.

The four corners of the two eyes are almost on a straight line, the inner corners are a little nearer the spectator.

24. The Nose.

The length from the hollow to the tip is about two inches. The bone provides comparatively little of the structure, the nasal bones being short, and ceasing at the bridge, which is scarcely half-way down ; the rest is built of cartilage.

The central cartilage of the end A, Fig. 51, proceeds further down than the side cartilages—the wings, B. The wings are in form between the circular and the angular. There is always a degree of angularity about them, but they are sometimes nearer the round, as in L, and sometimes nearer the square, as in M. Both the central cartilage A and the wings B curl up into the nostril. From the wing there passes a buttress, C, over the nostril to one bulb of the tip D. This buttress is less voluminous than either the wings or the tip, which stand up a little above it. Further, the buttress is hollowed above, as is shown in C and L. The tip consists of two symmetrical bulbs, D and E, between which there is generally a slight depression. From the tip the column starts upward, first being somewhat rounded at F, then flatter, wider, and bony at G, next thinner and rounder again at H.

The roundness continues till it reaches a slight hollow, I, which is observable in the skeleton. The side of the nose (J) is hard and bony, being built upon a plate of the superior maxillary. This surface is not flat, but slightly depressed at all its borders, and thus becoming similar, in bulging, to one side of an almond.

The nose of a woman is narrow and less boldly modelled than a man's. There is less width across at J J,

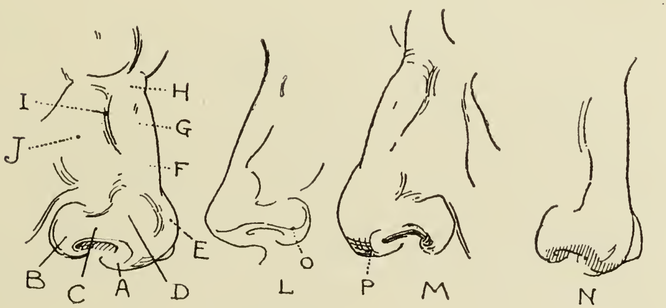

FIG. 51.

and less across the wings B B, and hence its walls are more precipitous. The modelling of the wing and tip are also much less forcible than a man's, and the nostrils have not the same appearance of dilation, but look pinched. L is the nose of a woman, but it also serves to show that the most projecting point is not absolutely at the end.

In drawing in outline the front view of the nose, it is customary to wave the descending line considerably in a man's, but it must be kept much straighter in a woman's.

The beauty of a Grecian nose is often spoken of, and it need only here be said that the Greeks filled up the hollow at the root of the nose, to some extent. The root, too, which in the diagram is marked H, is generally wider in the Greek heads, and not so sensitive, bony, and thin as in ours.

The line O indicates the modelling of the lower end of the nose, and divides the receding surfaces above and below it. Of these the upper is the more nearly vertical; the lower, more nearly horizontal and somewhat triangular, contains the nostril, and meets its fellow at the central cartilage, which is somewhat square in section, P.

25. The Mouth and Chin.

THE mouth, or more properly speaking the lips, form a mass, as distinctly in excess of the ordinary surface of the face as the nose or chin. In modelling a face a separate mass must be added. It is the lips that form the projection, the ends of the slit of the mouth being in the general mass of the face. Every one knows the three lines of the lips, and how the central and upper ones are in shape somewhat like a Cupid's bow. The simplest delineation of the mouth is shown in the small drawing, Fig. 52, A. In this it will be seen that starting at the centre between the lips, the slit forms "a line of beauty and grace," a double curve that is, to either corner. This arrangement is repeated, slightly varied, in the line of the upper lip. If this diagram (A) be compared with the mouth in the larger drawing, it will be seen that in the latter the lines of the lips are much more complicated. Following the curves in this, the slit will be seen to describe two gentle curves, before it has completed the one side of the lips proper; and then, what in the diagram

A is an ascending curve to the corner, is here first an arched curve, similar to those previously traced, followed by a sharp ascent to the corner. The same thing is observable in the upper lip, except that the first curve of the two is more rapid. The upper lip does not extend to the corner as might be implied by A, although it is longer than the lower. The curve of the upper lip in diagram A is, however, far from untrue, for its extension to the corner is based not on red lip, but on the *shadow* line

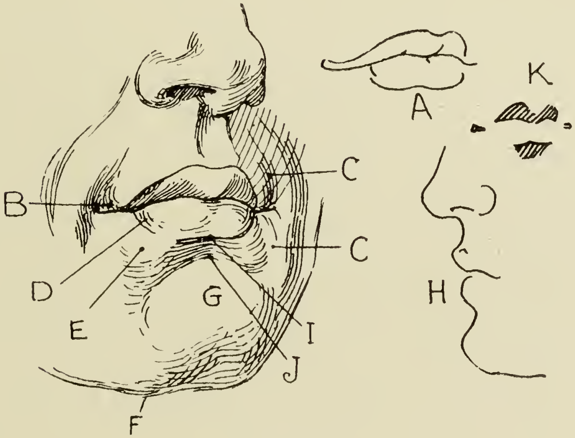

FIG. 52.

of the rapid turn of the modelling at B. The lips stand high, as has been remarked, and the fleshy fold covering the corner of the mouth stands high also, and between them, both above and below, is a hollow, depression, or gutter (C C), which folds into the slit at the side of the mouth, and assists very gently in giving delicacy and beauty to the feature. The direction of the upper of these two channels is indicated by the shading lines.

In diagram A the corner appears wide, whereas in actual fact the slit is there hardly perceptible. This width of corner represents not so much the end of the slit or lips, as the hollow or dimple formed by the fleshy fold already spoken of.

The mouth is made up of *alternating* channels and eminences. Thus, there is the well-known central eminence of the upper lip; this is opposed by the slight channel in the lower lip, a channel formed by the meeting of the two mounds of the lower lip, and therefore not at all inclining to a *concave*, but to a V-shaped channel.

These two mounds of the lower lip are opposed in the upper by a very gentle softening or depression. The lower lip terminates abruptly, the mounds rounding off boldly (D). As if to balance or contrast with this sudden finish, the upper lip opposes a little extra fullness to the vacancy in the lower caused by its termination, and dies, but *not* abruptly, into the slit.

Another item of contrast between the two lips is that the upper has one high point, the whole forming more or less a point forward. The lower lip has two mounds of equal height, and thus presents a flattish front.

The two mounds of the lower lip are repeated in the two surfaces (E) beneath it, and again in the two bony prominences under the chin (F). The chin itself has its greatest prominence rather high, where the letter G is, and is remarkably similar in profile to the tip of the nose, and the upper lip (H), all three being not only squarish in form, but obliquely placed, and at much the same angle.

A "clear-cut" mouth has considerable sharpness at the edges of the lips, a sharpness sometimes continuing the whole length of the upper lip, but confined to the front of the lower, since the rapid curving in D tends to make a hollow rather than to throw up a ridge. The sharp part of the lower lip (I), as well as the top of the chin (J), are important in drawing, as they are generally sharply accented. In "impressioning" the mouth one would seize the little mass of shadow between these lines, the shadow on the upper lip and the specks in the corners (K), thus arriving not a thousand miles from the treatment of the mouth on a child's doll. Diagram K will further serve to illustrate the fact, that the corners are not on a level with the division between the lips, but somewhat at the sides of the lower one. This is important; indeed nothing looks so bad as a gashy mouth.

26. The Ear.

THE names of the different parts of the ear will be found on diagram A, Fig. 53. The simplest outline shape of the ear is shown at D, and consists of an ovoid curve with a loop below, and another similar curve within it. The shape of the ear varies very greatly, and consequently a considerable latitude is allowed the draughtsman. Thus, the lobule below is sometimes small and drop-like, and sometimes broad, in which case it forms a fairly continuous ovoid curve with the upper part of the ear. As a rule, however, there is a distinct change of curve from the helix to the lobule. Between the helix and the anti-helix is a groove deepening and widening as it ascends. This sometimes appears quite wide and sheet-like in the ears of men, F. The width of the helix itself varies very greatly. It is a rolling over of the edge of the ear into the groove between it and the anti-helix. This rolling over is sometimes more and sometimes less complete and perfect. It is more frequently well rolled in women than in men. At all events it possesses, and generally exhibits, in the upper part a sharp edge partially concealed by being rolled or curled inward, which can easily be felt in one's own ears. It is scarcely necessary to point out that the helix wanders round the mass of the ear, receives a sort of buttress from the cheek, and then proceeds further inward and dies away about half-way down the ear,—a useful landmark, D. The anti-helix starts at the eminence called the anti-tragus, which makes a very considerable elevation. From the anti-tragus the anti-helix turns rapidly backward, and proceeds upward somewhat parallel

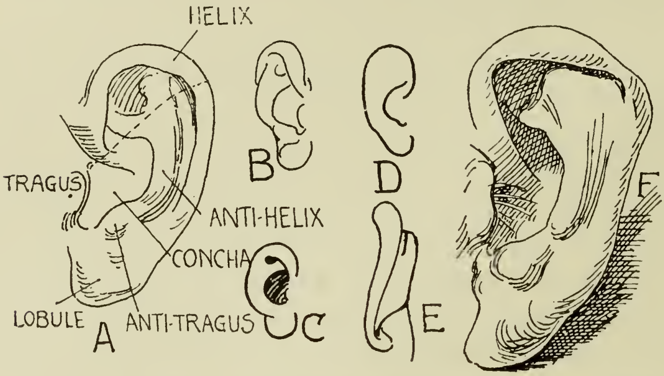

FIG. 53.—The Ear. F is a Male Ear.

to the helix, finally dying away into the fold of the ear by two extensions. The inner line of the anti-helix is, as shown in D, not dissimilar to the outline of the ear. The tragus occurring just before the concha, or *shell*, or hollow, takes its name from the fact of its sometimes bearing a number of coarse and long hairs, which suggest a goat's beard.

It is of very great importance that the modelling of the ear should be studied quite as much as the outline or diagrammatic shape. An ear that looks flat is intolerable.

It might almost be said that the modelling falls broadly into two masses, one upper and one lower. In Fig. 53, A, a dotted line will be seen from the tragus passing upward and backward. This virtually divides the two masses. The effect may be fairly seen in Fig. 54, C. The dotted line is roughly the nearest line of the ear to the head. From it at one side the helix sets off, and rises fairly high, forming the top of the ear, and descending as it approaches the other end of the dotted line. Similarly on the lower side of the line, what there is of the helix below gradually rises, the gradient being continued in the lobule, the higher part of which is to the backward, from which the modelling sinks to the cheek edge of the lobule. The modelling of the anti-helix and anti-tragus is bolder. They may rise as high as the helix where it joins the lobule, but not higher. Viewed from somewhat before, the anti-helix hides part of the helix, the low-lying part, as is shown in Fig. 53, B, where also the palpable twist of the upper part of the helix is shown.

Broadly speaking the ear is as two arches, one above passing from before backward, and one below passing vertically upward *under* the upper arch.

In expressing modelling as opposed to flatness, no artist has excelled Dürer; he was never insipid, never tame, and one reason is that his modelling was so distinct and bold. In his ears he carries out the same system, the convolutions intertwine like serpents. The diagram C is enlarged from a very small ear in one of his wood-cuts. The means of production, the coarse wood-engraving of the time, compel him to epitomize. There are therefore very few lines, but he has expressed exactly the in-and-out character of the feature.

The back view of the ear shows the outside of the concha supporting the main mass, E.

The position of the ear is just upon the edge of the jaw. In men it is almost vertically placed ; in women it is inclined considerably backward, and is smaller proportionally.

It must be observed that the masses seemingly round in section are often flattened or doubled. The expression "doubling" may stand for the placing of, say, two smaller curves in place of one large one, or representing, instead

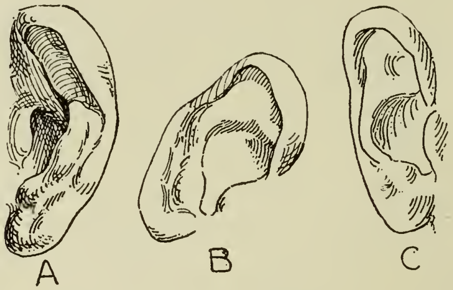

FIG. 54.—Three Female Ears.

of a half globe, a form which approaches that shape, but has two mounds. In the ear there are many instances of doubling, sometimes trebling and quadrupling. Thus the lobule contains really not *one* domed surface, but several. (See Fig. 54, A and B.) The helix is very often doubled, especially in men, there being a suggestion of two circular cords twisted in one mass, rather than *one* circular cord of equal bulk. This results in flattening. (Fig. 53 F, and 54 A and B.) The latter two examples are taken from a book on drawing published in Venice in 1762. A bad period, the reader will say. Bad for many things, unfortunately, but the flesh always looks fleshy, perhaps even doughy, and there is an excessive care for the "doublings," as they have been called above. Artists of this period seem to have carried their study and expression of fleshiness and squareness of form rather too far; but it is doubtful whether we shall run to quite such lengths; and a glance at their works may be rather beneficial than otherwise.

27. The Neck: to what degree cylindrical.

The neck of a woman is nearer a cylinder in form than that of a man; the splaying out to the trunk is less marked, as are the anatomical forms generally, while the whole neck is proportionally longer. The front view of a

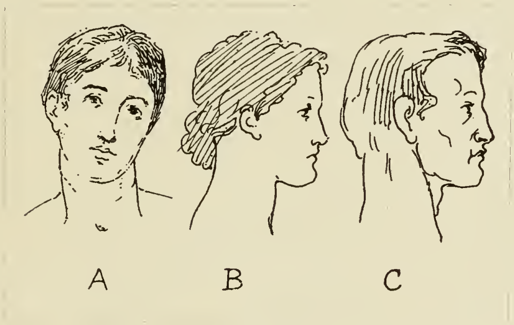

Fig. 55.

woman's neck may then be fairly represented by two lines, very slightly curved, after the manner of Hogarth's "line of beauty and grace." This is, of course, only true of the upright position; any bending immediately brings into prominence some of the anatomical details, which are referred to in subsequent paragraphs.

In side view, also, the neck of a woman is nearer the simple cylindrical form than a man's, though in this view the cylinder is bent, being outlined by the graceful curves of the neck and throat. In a man the muscles at the back of the neck bulge out and destroy the similarity of the two outlines. Compare A and B, Fig. 25.

There are suggestions of flatness at the back and sides of the neck, particularly in the male. The back is formed by the upper part of the trapezius muscles, and has a slight channel down the middle of it, neutralized below by the spines of the vertebræ which become prominent, and above, when the head is heavily dropped, by the ligamentum nuchæ.

The flatnesses at the sides extend from the ears backward to the trapezius, there being sometimes a slight concavity between the sterno-cleido-mastoideus and trapezius muscles.

28. The Bones of the Neck.

FIGS. 56 and 57 illustrate the bones of the neck. The names of the separate bones and their characteristic features will be found on the diagrams.

In Fig. 58 is illustrated the ligament of the neck, which stretches from the vertebra prominens to the occiput. The obliquity of the base and jaw of the female skull, as contrasting with the squareness and horizontality of the male, may also be noticed ; an obliquity which extends to

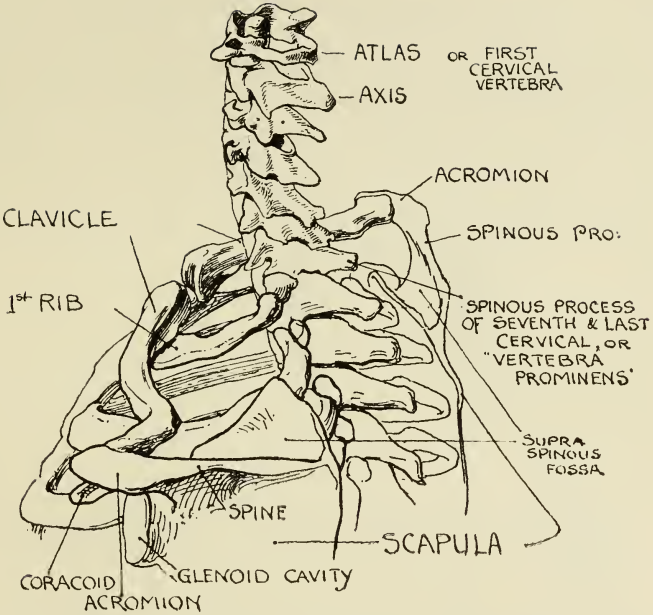

Fig. 56.—The Bones of the Neck with the Clavicles and part of the Scapulæ.

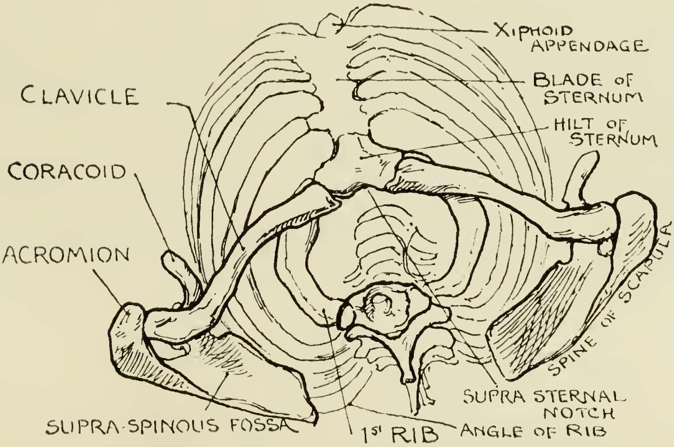

Fig. 57.—The Bones of the Trunk viewed from above, showing the shape of the bony base of the Neck.

the first rib as well. The tilting up of the base of the female skull lengthens the back of the neck.

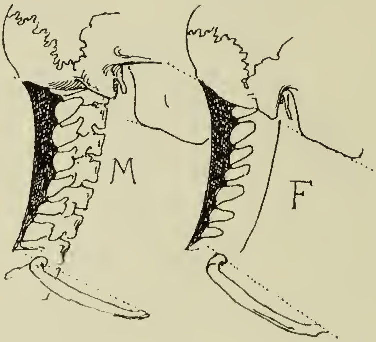

FIG. 58.—The Male and Female Necks, with the Ligamentum Nuchæ.

29. How the Neck fits on to the Trunk.

THE neck considered as a tolerable cylinder fits fairly cleanly into the trunk, almost as if it continued into the interior without altering its own general shape, or that of the trunk. Its base may be said to be the first pair of ribs, down to which it plunges without much moderation of the angle thus made with the shoulder, or horizontal part of the neck. This is more to be remarked in the necks of women, and especially if the shoulders be raised, when the neck appears standing in a hollow, and surrounded by the collar-bones and the muscles at the back of the neck. (Fig. 59, A.) If, however, the neck be cylindrical above, it is little more than half a cylinder that settles down into the trunk in the manner just described. The important trapezius muscle (see paragraph 34), while it lies as a flat sheet on the upper part of the back, wraps over the shoulder, and forms buttresses at either side of the neck in the manner suggested in the diagram, which buttresses of course take the place of the hinder half of the lower part of the cylinder. (Fig. 59, B.)

The extra length of the neck in the woman is due to the dropping of the collar-bones. For assuming the lower end of the breast-bone to occupy the same position in both

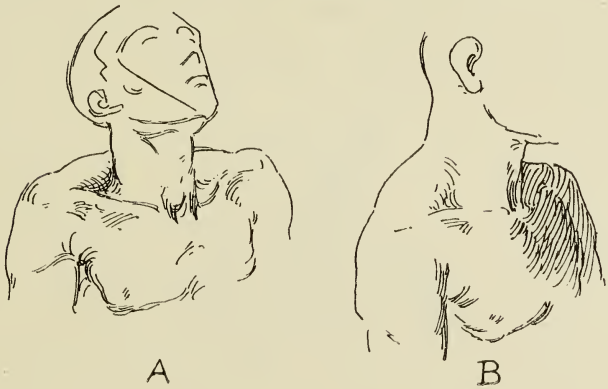

FIG. 59.

sexes, the breast-bone of the woman being shorter proportionally by almost half an inch, drags the collar-bones and the first pair of ribs down a corresponding distance, thus leaving the neck as much longer. It is therefore the columnar or forward part of the neck that gains in length. The vertebra prominens is very little lower.

30. The Sterno-cleido-mastoideus.

THE muscle is seen in its completeness in the three-quarter view of the neck. The sternal head appears the more important, lying in a direction very suggestive of a lady's bonnet-string. Above, under the ear, it forms one mass with the clavicular head, and the section of the two together is that of a swollen ribbon-form, being at once fleshy and broad. The form of the mastoid process itself helps to govern the section, the mastoid resembling an inverted fir-cone, somewhat flattened. The sternal head descending becomes rounder in section, the widest part of the whole muscle being at about the half-way down its

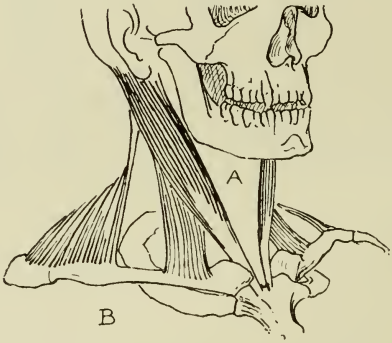

FIG. 60.—Sterno-cleido-mastoideus Muscle.

Attachments—above, to the mastoid process of the temporal bone, and backwards some distance along the superior curved line of the occipital—below, by the inner or sternal head to the front of the top of the sternum, and by the clavicular head to the innermost third of the upper border of the clavicle; the head of that bone lying between the two attachments.

course. The sternal head is concluded by a cord-like tendon running on to the breast-bone. This tendon is *in front* of the muscle, and hence even in well-fleshed women and children it shows in many poses as a sharp cord. Indeed sometimes when the borders of the various muscles are quite lost in one soft somewhat cylindrical mass, these two tendons start up buttress-like from either side of the pit of the neck. (Fig. 61, B.)

One of the actions of this muscle is to turn the chin toward the contrary shoulder, when the tendon is seen as a very sharp cord, though perhaps at its sharpest in the action of raising the head from the ground, when the person is lying on the back. Then the whole muscle, up to the mastoid, becomes cord-like.

The clavicular head is fairly broad and ribbon-like. It assists in splaying the neck on to the shoulder. Between the two attachments is the head of the collar-bone, showing

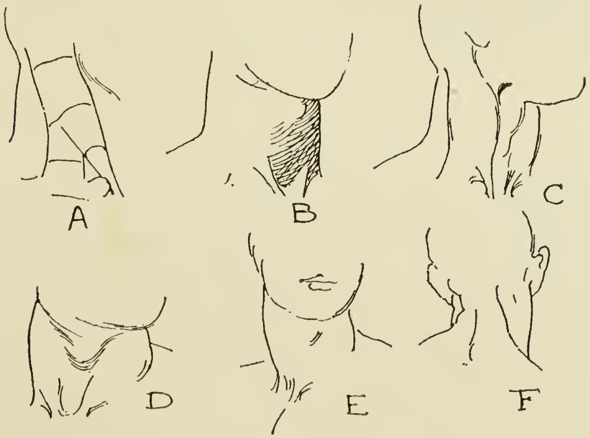

FIG. 61.—Effect of the Sterno-cleido-mastoideus.

very prominently, while above it is a small triangular vacancy between the two "heads." The mistake must not be made of attaching the cord-like tendon to the head of the collar-bone.

In thin and muscular persons, particularly in men, the borders of the muscle show with considerable distinctness. The outer border, though visible, does not produce any sudden change of surface in the modelling, which is most voluminous at about the middle of the sternal head, swelling out under the angle of the jaw, and meeting the mass of the throat with considerable abruptness. (Fig. 61, D.) Immediately under the angle of the jaw there is a softening which is shown in the diagram (C), as if the inner border of the muscle turned sharply round to the chin. The sterno-cleido-mastoideus, lying then as a diagonal cord-like projection, makes the outline in three-quarter and similar views. Its curve is almost always a full swelling curve returning sharply where the tendon occurs. It is straightest when the chin is turned to the contrary side, and the neck is stiff; but sometimes with this action the line is considerably broken and angular.

31. The Throat.

Between the two sterno-mastoids, or bonnet-strings, is the triangular space of the throat. Its apex is at the pit of the neck, its base from angle to angle of the jaw. Another triangle extends from this same base to the chin, and the two together form the space now to be spoken of. At this common base lies the *hyoid* bone, or *U-shaped* bone, generally omitted from the specimen skeletons to be seen in our schools. It lies fairly horizontally, with the tails of the U directed backwards, and not too deep but that it may just be felt. This hyoid bone is the uppermost piece of the larynx, the swallowing and vocal apparatus, the other pieces being the thyroid and the cricoid cartilages. It is the thyroid cartilage which forms the mass of the Adam's apple. Upon it occurs a little extra projection coming close up to the skin. The thyroid cartilage is in shape a short piece of a tube, and beneath is the cricoid or ring cartilage, somewhat similar in front to the hyoid bone. These forms are all more distinctly seen in men than in women, for two reasons: first, because they are larger and lower, and second, because they are less masked by the *thyroid body*, a gland which is not only larger in women but more prominent also, supplying the graceful fullness before a woman's throat. (See Fig. 55, B.)

In drawing the neck front view, it will be found that the tubular mass, the thyroid cartilage, must first be expressed, and will fill up very nearly the space between the sterno-mastoids if these are well developed. Then the centre of this mass must be peaked with the sharp projection before-

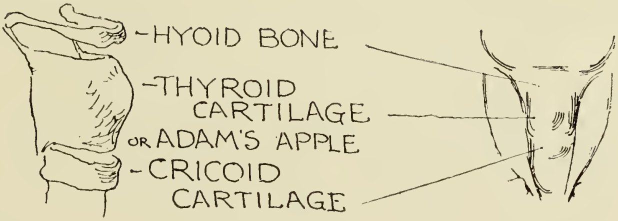

FIG. 62.—The Larynx.

named, while below must be the second horizontal ridge, the cricoid cartilage.

If the chin be held up, and the action of gasping be performed, all the forms of the throat will be brought out, and these amount for the draughtsman to two divergent masses above the apple, and, say, four divergent masses below it, while on either side is a soft, less formal mass filling up the diamond of the throat. (Fig. 63, A.) The divergent masses virtually meet on the hyoid bone. The muscles which produce those forms are too numerous and small for a detailed description to be much more valuable, practically, to the draughtsman than what has already been said. One only need be specified by name, the *omo-hyoid.* (Fig. 63, B.) The importance of this little choking muscle is due to its being the sole disturber of the emptiness of the triangle on the other side of the sterno-mastoid. The omo-hyoid runs from the upper border of the blade-bone to the hyoid-bone. Although the blade-bone is most distinctly at the back of the figure, yet the part above the spinous process of it comes forward considerably. The omo-hyoid is moreover a double muscle, having two fleshy bodies continuous with one another, somewhat, may it be said, as two sausages,

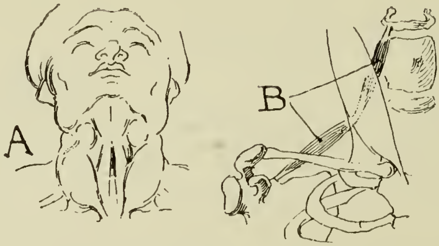

FIG. 63.—The Throat. B, the Omo-Hyoid.

and joined together in somewhat similar fashion by an intermediate tendon. This intermediate tendon passes under the sterno-mastoid, which appears to hold it down, and form a central attachment. From this position the muscle proceeds in a new direction, more vertical, up to the hyoid bone. This upper part, in the throat, shows no more than the other small muscles of that region. The lower part is a little more in evidence, making a dull prominence along its course, though often hardly discernible.

32. The Collar-Bone.

THE two collar-bones form together a horizontal line limiting the neck below and the trunk above. Each collar-bone is in form a double curve, "a line of beauty and grace." The two together, with the breast-bone between them, and the acromion processes at either end, form a shape resembling a Cupid's bow, or the curve of an upper lip. (Fig. 64, A.) It will be seen by Fig. 57 that the acromion completes the double curve of the collar-bone, and comes further forward than the outer end of that bone.

No one can succeed in drawing the figure who cannot draw models or simple rigid objects well, and who cannot

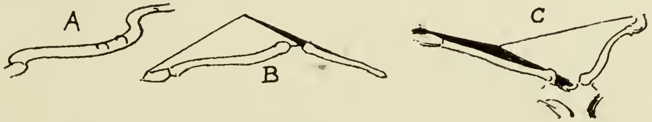

FIG. 64.

easily represent them in any position in perspective. The figure draughtsman must be able to similarly cast the bony structure, of which the collar-bone forms the chief part, into any position. He must boldly foreshorten the farther bone, and must be able to show the two sides sloping downwards when the shoulders are kept low (B), or upwards, when they are raised (C), or one side lowered or raised, while the other is held level.

The blade-bone can be moved about very freely, gliding between the muscles of the back, over the curved basket of ribs. Its only articulation with bone is the joint between the acromion process and the collar-bone. This joint is fairly free ; and therefore when the blade-bone is raised or depressed, the inch or more of acromion at the end of the Cupid's bow, made chiefly by the clavicles, turns a little upward (Fig. 65, A) or downward (B). When the acromion is thus bent downward, the outer end of the clavicle makes itself more evident. A good deal of the collar-bone and of its extension, the acromion, is subcutaneous, that is, close under the skin. The various muscles attach to their upper and lower borders. Sometimes in a drawing the lines will stand immediately for bone, and sometimes by representing the edge of the muscular mass will only suggest the bone, as in C.

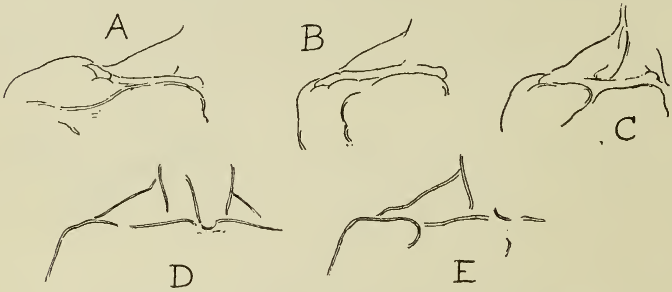

Fig. 65.

As a rule the bone gives the form above, the muscular mass below. Starting from the pit of the neck, after the tendon of the sterno-mastoid comes the head of the clavicle, boldly; then follows the insertion of the cleido-mastoid, but without sufficient volume to gain precedence of the bone, which provides the whole of the upper line. For beyond the cleido-mastoid there is the "salt-cellar" hollow, broken only by the omo-hyoid, which is some little distance within; then to this hollow succeeds part of the trapezius muscle, not generally sufficiently voluminous to make a fleshy ridge; at all events not one so pronounced as that of the deltoid, just below on the opposite or under side of the bone. This deltoid mass continues hardly half-way along, when there succeeds a small sharp vacancy followed by the masses of the great pectoral muscle. Let it be noticed that the lines bounding these muscles are not simple curves, but are made up of a succession of short convex ones, expressing the bundles into which all muscles are divided. In what may be called the draughtsman's shorthand, one line generally suffices for the top of the shoulder, falling a little as it proceeds inward, the other part of the collar-bone being represented by a line inclined the other way. The line over the shoulder must either stand for the acromion and a little of the clavicle, or for the mass of the deltoid. (Fig. 65, D and E.)

33. Some Subordinate Muscles of the Neck.

At the side of the neck will be seen three comparatively unimportant muscles. These are the *Scalenus*, the *Levator anguli scapulæ*, and the *Splenius capitis*. There are properly three Scaleni,—anticus, medius, and posticus.

The Scaleni, divergent downwards, and standing upon the first and second ribs, form the spreading base of the neck. Very little of them reaches the surface, but this little forms an important mass at the side of the neck (Fig. 67, A), a mass which fills the apex of the external triangle of the neck. The line representing in a drawing the Scaleni radiates with the cleido-mastoid from under the ear (B).

Splenius capitis and Levator anguli both show a little of themselves against the Scaleni. Their position is, however, higher and further back. If they make any surface lines they will be similar to the Cleido-mastoid and Scaleni, radiating downward from behind the ear; but while the Scaleni line is about vertical, these will run backward a little (C).

Perhaps the Splenius and Levator are most useful for their suggestiveness of form, rather than for their actually

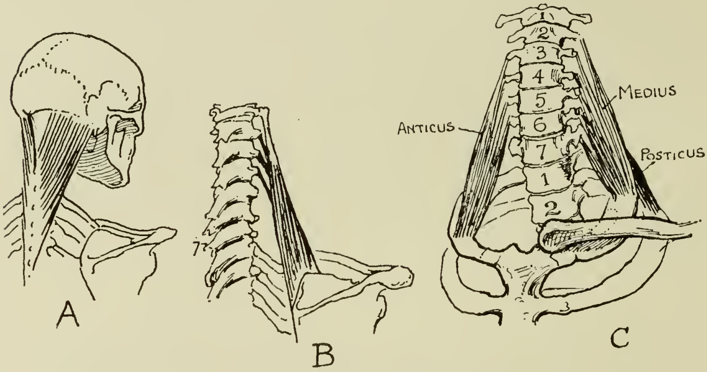

FIG. 66.—Minor muscles of the neck.

A. Splenius capitis. Attachments—Occipital bone and mastoid process of temporal—Spines of the vertebræ of the lower part of the neck and upper part of the back, and the ligamentum nuchæ.

B. Levator anguli scapulæ. Attachments—Transverse processes of first to fourth cervical vertebræ—Angle of the scapula.

C. Scalenus, anticus medius, and posticus. Attachments—Transverse processes of certain of the cervical vertebræ, the anticus to the third, fourth, fifth, and sixth, the medius to the second to the seventh, the posticus to the fifth, sixth, and seventh—anticus to forepart of first rib, medius to hinder part of first rib, posticus to hinder part of second rib.

providing any themselves, or alone. Thus Splenius capitis assists one to realize the upward divergent character of the form of the neck, which is subtly interwoven with the downward divergent as represented in the Scaleni and in the Levator anguli scapulæ. Almost all of the Levator is hidden under the large muscle, the Trapezius, which has next to be noticed, but the form of the neck is much more

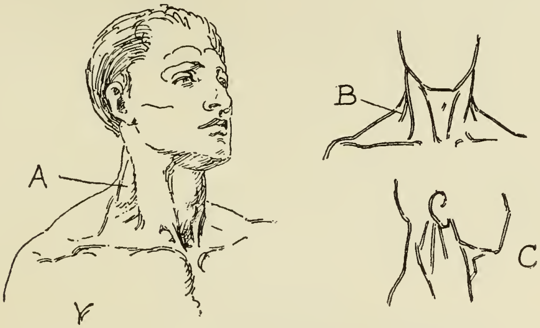

Fig. 67.—Mass produced by the Scaleni.

readily suggested by the Levator because, as will be seen the Trapezius does not take the shape which seems most logical, considering its attachments, but is bound down till it takes its form from the muscle beneath, the Levator.

34. The Trapezius Muscle.

A TRAPEZIUM is a geometrical figure having four sides, a kind of elongated diamond. The four points of the muscle trapezius are at the occipital bone of the skull, the spine of the last dorsal vertebra, and the two acromions. The muscle properly is in two triangles, with bases together at the spines of the vertebræ and apexes on the shoulders. Only the upper part of this muscle is concerned in the neck, and it must be noticed that instead of there being a direct line from the back of the head to the acromion, there is a double line following in the upper part, the Levator anguli, and in the lower seeming to connect the acromion with the seventh or fifth cervical vertebra. Indeed there is a sort of cord-edge visible in the back passing in the direction described. (Fig. 69, A.) The part above this, and forming the narrow back of the neck, passes to the front.

The cord-like edge forms the back line of the base of

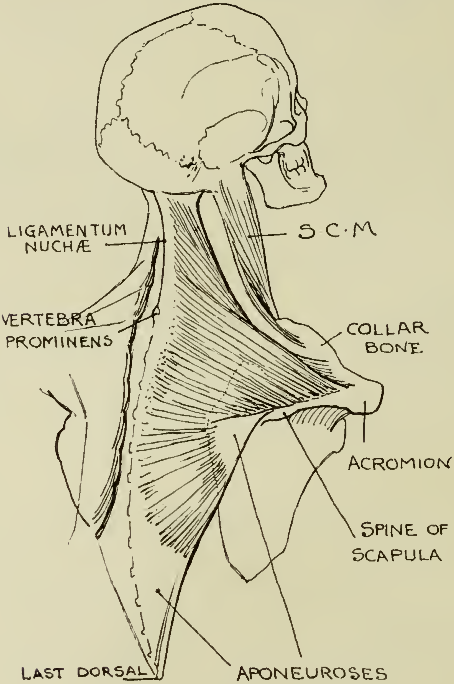

FIG. 68.—The Trapezius Muscle.

Attachments—Spines of all dorsal and last cervical vertebra, ligamentum nuchæ, from last cervical to occipital protuberance, and one-third of superior curved line of occiput—Outer third of hinder border of collar-bone, inner border of acromion, upper border of spinous process of scapula, all in continuity. There is an aponeurosis at the vertebral insertion, which expands around the vertebra prominens and also at the lower end, and there is a triangular aponeurosis, covering the root of the spine of the scapula.

the neck and the upper limit of the trunk; and from the front appears in continuity with the outline of the face; a useful fact, serving to keep the neck at a proper length. The bony girdle represented in front by the collar-bone passes over the shoulder in the acromion, and continues downward on to the back in the spine of the scapula. From the cord-edge the muscle falls softly forward over the shoulder till it reaches its insertion on the outer third of the collar-bone, and thus completes the outer triangle or salt-box of the neck. (Fig. 69, B.) The border is hardly perceptible in the lower part upon the shoulder,

FIG. 69.—Effect of the Trapezius on the neck.

melting gently into the general mass, but the narrow part up the neck shows its edge pretty clearly (D). It is in the region of the trapezius that the back curve of the neck occurs with its sexual peculiarities. In the female it is a graceful hollow curve; in the male the hollow is filled up, as has before been noted in paragraph 27. When, however, the female neck is bent, there occurs generally a swelling in the outline (Fig. 70, A). Above the swelling the line returns emphatically to its low position at the spine of the occiput (B). This variation of the curve of the back of the neck in women is a great addition to its gracefulness.

35. Certain other Details of the Neck.

It need only be mentioned that the external *jugular vein* crosses the sterno-mastoid at about the middle of its course, coming from beneath the angle of the jaw. (Fig. 70, c.)

The *Platysma Myoides* (D) is a skin muscle covering the whole of the front of the neck, and reaching up the face as high as the mouth and cheek. Its extent is remarkably

Fig. 70.—Some Details of the Neck.

similar to that of the camail, or capmail (E), worn in the fifteenth century. The fasciculi, or fibres of the muscle, radiate from the region of the mouth, some going almost immediately backward, and assisting in the expression of laughter, the rest spread out over the neck towards the collar-bone. It is a muscle of very little account, and possibly of most use in making ugly faces, after the manner of a Chinese bogie, and in shivering.

36. Proportions of the Neck and Shoulders to the Head.

The length of the neck in diagrammatic front view is, from the chin to the heads of the collar bones, three inches in man; in woman a little more. Or, finding an equal measurement up the face, it falls in man at the top of the wings of the nose; in woman at the middle of the nose, A and B, Fig. 71.

In profile it may be noticed that the length from the nose to the end of the chin, is about equal to the neck from the corner under the chin to the hollow just above the head of the clavicle, C; while the horizontal under-side of the chin is less than, or is perhaps equal to, the distance from the chin to the top of the mouth, E.

As to the width of the neck, it may be taken as equal

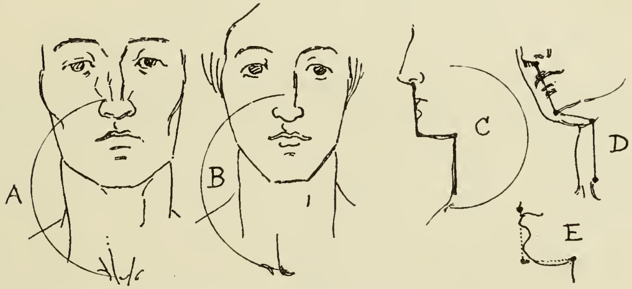

FIG. 71.—Proportion of the Neck to the Head.

to the width of the jaw at the angle, and the outlines may be commenced there, as is shown in the diagram. The length of the male neck to the bottom of the pit of the neck is $3\frac{1}{2}$ inches. By Fig. 19 it will be seen that the male collar-bone is 6 inches, the female $5\frac{1}{2}$ inches, in length. With an inch for acromion these measurements become 7 and $6\frac{1}{2}$. An exact rule for proportioning this to the head, or head and neck, seems impossible, but a tolerable guide is this,—that from the pit of the neck to the bridge of the nose, and also to the end of the acromion, are equal, the limit being considered to fall lower down the nose in woman than in man.

THE TRUNK

37. Drawing the Trunk.

THE first marks on one's paper in drawing a figure, are probably a slight stroke to fix the top of the head, another for the ground, a third for the centre of the figure, and two faint lines to indicate the position and obliquity of the shoulders and waist. Then it is perhaps best to indicate the bulk of the thorax and hips, as in Fig. 20, A, by a line at either side of each,—four lines in all. These four lines allow not only the relative position of the two parts to be suggested, but the sex also. For a man, the chest must be wide and long, the hips narrow and short; for a woman the chest must be narrow and short, the hips long and wide. (Compare A and B, Fig. 72.)

After the four lines just spoken of, the head and neck will be massed-in, if a front view is required; and then the slanting lines of the shoulders, pointing to the chin; then a line for the collar-bones. In a back view one would probably draw the slanting lines of the shoulders, as in B, before the head.

The shoulders, breasts, and thoracic arch will then be suggested as in the diagram, as well as the central line, which, though on the whole a flowing curve in most postures, must be kept fairly straight in the chest, and the chest-part of the back. Its extension in the gluteal crease

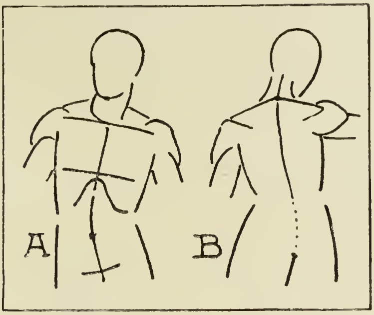

FIG. 72.

is generally straight and at a slight angle with the line itself.

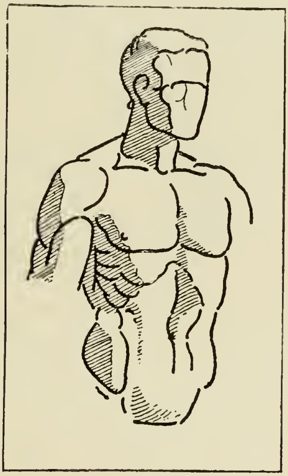

FIG. 73.

We will briefly examine a few typical positions, and remind ourselves of those matters which are of the greatest importance. Thus we shall briefly epitomize what is explained at length in succeeding paragraphs.

Fig. 73 is a male torso, three-quarter view. We notice how the chest diminishes downward to the waist, the outline of the back, seen under the arm, contributing very largely to the effect, and being itself a full convex curve.

The chest is square in section (see paragraph 39), but the squareness ceases with the ribs. The middle line

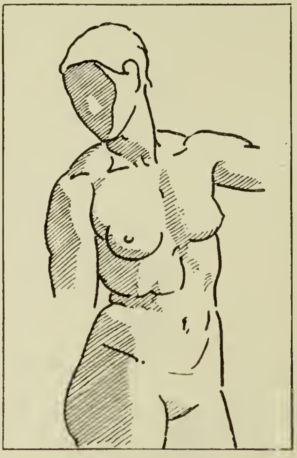

Fig. 74.

lies in a slight trench of very unequal character. Often the edge of the ribs projects so prominently as to produce a receding surface, fairly flat, running down to the middle line as indicated by the shading. The middle line itself comes steadily forward from the pit of the neck to the pit of the stomach, where the breast-bone ends, when it falls back to form the narrowness of the waist. (See Fig. 81, page 122.) From the waist it rises again over the abdomen, but it must not be continued far below the umbilicus. On the chest the bony prominence of the breast-bone will break the simplicity of the middle line there, as is shown in the diagram. In women, the irregularity is much less prominent.

A few of the ribs may be suggested, as shown. They must be nearly parallel. Above them should be three or four markings for the serratus, at a different angle to the rib-bones, and radiating more distinctly. The

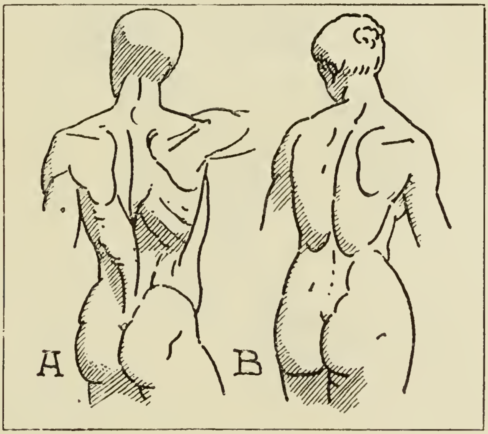

FIG. 75.

uppermost, level with the breast, will be about horizontal. The lines for the collar-bones will be short. The surfaces above them, forming as it were the top of the trunk, must be remembered and expressed as definite surfaces, at an angle with the chest, though rising as they recede. The mass of the deltoid, capping the arm, must encroach well upon both the shoulder surface just spoken of, and the chest.

As regards this view we will here only note further that the line of the *iliac crest*, ending the trunk below at the side, is obliquely placed, not horizontally.

The same view of the female torso is given in Fig. 74. The chest is smaller in bulk, the hips larger, the waist longer and more mobile. The shape of the breast, distinctive as it is, is less important to the general appearance of sex than the differences just pointed out, to which may be added the following. The shoulders are more sloping,

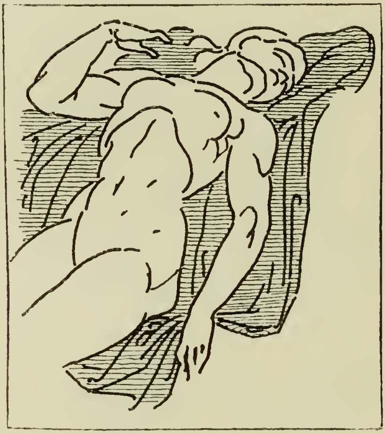

FIG. 76.

and their connection with the arm more evident than in the male. The deltoid, although less marked in shape, is very full, particularly in its lower part, at the outer side of the arm. The muscular and fatty fold between the breast and the arm is important in a good figure. The muscular mass at the side of the abdomen, the *external oblique*, does not make so definite a fold ; and the iliac crest although it should be represented must be as delicately so as possible.

In the back view (Fig. 75, A and B) the blade-bones may be suggested by a twice-curved line; a straightish line may represent the spine of the blade-bone running up to the outer end of the shoulder. Below, above, and between the blades are numerous minor masses of modelling, which are most clearly expressed when crushed by the blades against the middle line, or upward or downward. When the arm is raised the muscles are of course stretched out and allow the direction of the ribs beneath to show somewhat (A).

The chief characteristics of the form are however the long lines from the arm-pits, which curve more and more backward as they descend, and then continue vertically to the iliac crest, or the ribs just above. The muscles to which these correspond are the *erector spinæ* and *latissimus dorsi*. In the male their vertical masses remain well-defined up to the middle line. In the female there is a broad, comparatively vacant, space in that region. The softness and simplification so characteristic of the female figure is well seen in the back. The shoulders, or upper part of the back and lower part of the neck, are well rounded, and form part of an extensive surface, softly rounded, which reaches down to the waist. And again, from the waist downward over the loins and hips is another simplification of the same kind. Both these are suggested in B.

It is in such attitudes as Fig. 76 that the bony structure of the trunk asserts itself most palpably. The drawing would be commenced by a line at either side of the chest and hips, as in the cases above, but it is the line of the *thoracic arch* which indicates the foreshortening and consequently the pose of the figure. For the thoracic arch, or the lower part of it, is the *base* of the chest. Above, the collar-bones are able to exhibit their graceful curvature, and provide the outline. Below, the thighs appear spliced into the haunches; the abdomen coming down between them, and the mass composed of the *external oblique*, the *iliac crest* and part of the *gluteals* enclosing them at the outside.

38. The Bony Mass of the Trunk—The Iliac Crest. The Sacrum.

THE thorax is the basket of ribs, the pelvis the bony basin of the haunches supporting the boneless fleshy mass of the abdomen. It might be said that the inside of the pelvic basin belongs to the trunk, the outside to the thighs. The inside and outside are divided by a lip or edge, which thus marks the lower extremity of the trunk and the upper extremity of the thighs.

In side view the iliac crest approximates to two lines, one, towards the front of the figure, longer than the other, and containing between them a right angle placed vertically. (Fig. 77, B.) The end of the longer line is the *Superior Anterior Spinous Process*, or Spine, the end of the shorter the *Superior Posterior Spine*. The junction of the two lines is the highest point of the pelvis, but it is not the nearest to the spectator as he takes a side view. The nearest point would be some little distance down the longer line.

In plan each crest is a variation of the line "of beauty and grace," the smaller curve of which, the hinder part, fits against the sacrum. In the artificially articulated skeleton the crests are joined to the sacrum by a bolt. This mechanical contrivance very well illustrates the rapidity of the return curve.

The *sacrum* is the *immovable* part of the vertebral column, and is an agglomeration of five vertebræ. It is leaf-shaped. (Fig. 77, D and F.) Down the middle of its hinder surface are the remains of spinous processes, and below it are two or three small bones, vertebral in origin, called together the coccyx. The side lines upward from the coccyx form the continuation of the iliac crest now being traced, and hence the surface of the sacrum belongs to the trunk, and, behind, the trunk

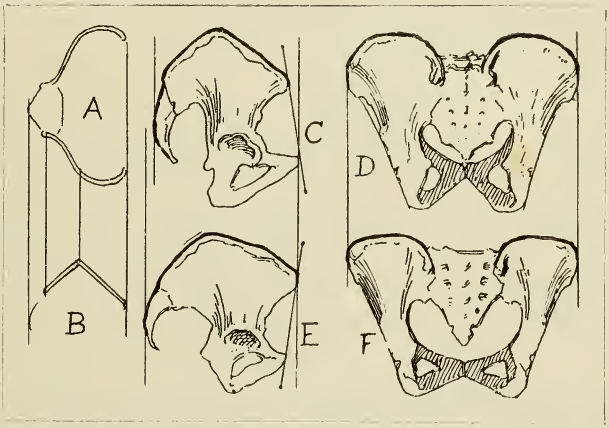

FIG. 77.—The Pelvis showing the iliac crest. C and D male, E and F female. A, plan, and B, elevation of iliac crest.

has somewhat the cut of an Eton school-boy's jacket. (Fig. 78, A.)

The iliac crest is continued in front by *Poupart's ligament* from the sup. ant. spine to the symphysis pubis, or meeting of the pubic portions of the pelvis, thus forming the *groin* of the abdomen, and completing the lower limit of the trunk. (Fig. 78, B.)

The diagrams include the forms both of the male and female. The difference between the two in the pelvis is very marked, and may be summed up as follows. The female pelvis is deeper from front to back. The measurement from side to side is the same in both ; but considering the shorter stature of the female, the pelvis in that sex becomes relatively the wider. The remarkable manner in which the male pelvis falls backward, and the female forward, is illustrated by the oblique lines C and E, Fig. 77. In the same diagram the crests are drawn in darker lines, and it will be seen that the male is in side

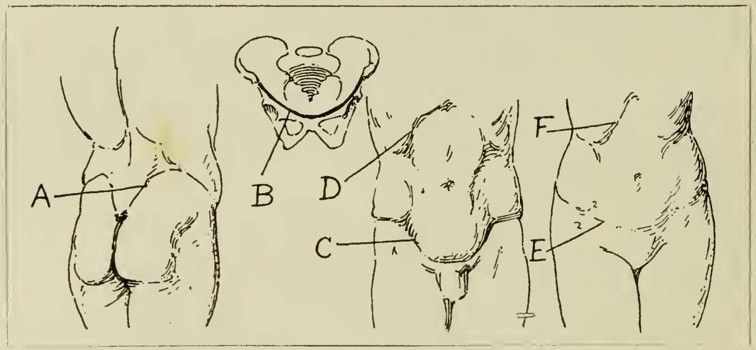

FIG. 78.—The Line of Division between the trunk and the thighs. A, post. sap. spine. B, Poupart's ligament. D and F, thoracic arches. C and E, groins.

view more angular, and in the back view rounder than the female, which approaches the horizontal, particularly in the back view. In Fig. 78 the groins of the abdomen may be compared. The female is shallower, and does not reach so far down. The groins may also be compared with the thoracic arches above. Thus in the male, C and D are similar, though inversely placed ; in the female there is no similarity between the shallow E and the angular F. Further, the female sacrum is broader, so that the superior posterior spines (Fig. 78, A) are further apart.

The sacrum itself is also flatter, less disturbed by the muscles upon it (see paragraph 42); less over-hung by the iliac crests, and consequently nearer the surface, which it renders smoother; and furthermore set at a greater inclination from the vertical, and thus increasing the apparent size of this region by extending the surface up toward the waist. And this generalizing of the form of the lower part of the back may be compared with the generalizing of the upper part of the front of the trunk in the same sex, where the chest and neck are united into one surface by the less prominence of the collar-bones.

39. The Bony Mass of the Trunk—The Thorax.

THE thorax is generally described as a truncated cone, more oval than round in plan. In studying the thorax the male should perhaps be taken, as the female is the same with the angles and peculiarities softened. In diagram 80, the two are placed side by side.

Considering the thorax as a truncated cone, the cone has curved sides, and is perhaps pretty nearly represented by a Spanish nut. And if the variety found in the shape of Spanish nuts be also noted, it will be seen to suggest the thorax in the male and in the female. Some of these nuts are squarer than others, and the male thorax (Fig. 80, A) is squarer than the female (D). From the third to the tenth rib, the outline is almost a vertical straight line.

In side view there is a similar smoothness of curve in the female. In the male the first rib drops at a considerable angle. To this succeeds the "hilt," or upper part of the breast-bone (sternum) F, leaving the plane of the first rib at much the same angle as that leaves the horizontal. Then the plane of the body of the sternum (G) leaves the plane of the hilt at much the same angle; again, the plane of the xiphoid appendage

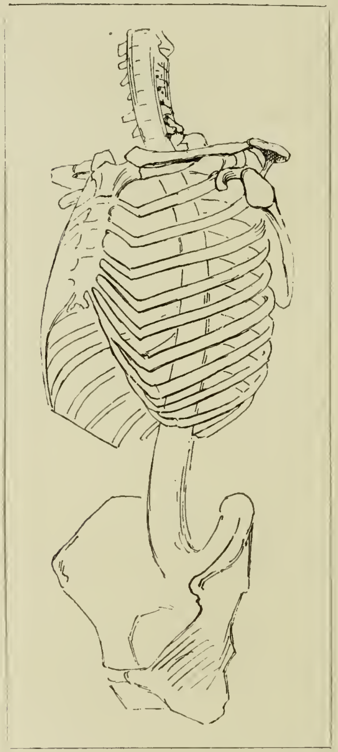

FIG. 79.—The Bony Mass of the Trunk.

(H), at the same angle, reaches the vertical; and it may even be said that the slanting backward of the ends of the eighth, ninth, and tenth ribs, is also at the same angle (I). The lower end of the thorax is horizontal, the two last ribs, the eleventh and twelfth, reaching the limit as if they had been shorn of their extremities (J). K shows the greater inclination of the first ribs in the female. The measurement of the thorax in front is about twelve inches. Of these, six inches belong to the bony part of the breast-bone; that is, to the hilt and body of it, omitting the cartilaginous extension below, the xiphoid appendage. The lowest point of the front of the thorax is the cartilage attaching to, and lengthening, the tenth rib. This point is also the lower end of the *thoracic arch*, which is formed by the costal cartilages. All the ribs are connected with the breast-bone by strips of cartilage similar to the ribs

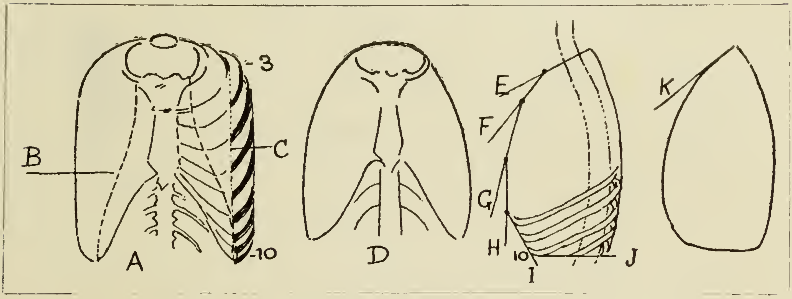

FIG. 80.—The Male and Female Thoraces.

in thickness; and these costal, or rib, cartilages are short above and long below, and find their limits on a graceful curve (Fig. 80, B), falling from the top of the breast-bone to the corner provided by the tenth rib, the lower extremity of the thoracic arch and the thorax itself in front. The thoracic arch is roundest, or more truly arch-like in the antique than in modern models, while in modern women it is generally said to be furthest from the round arch. Undoubtedly the well-rounded arch greatly improves the male figure.

There are seven *true* ribs, five false, of which two are floating, the eleventh and twelfth. A true rib is one which has a costal cartilage of its own, all the way to the breast-bone. The three false ribs, the eighth, ninth, and tenth, have costal cartilages, but they have to be content with attachment to that of the seventh or last true rib. What is important to notice in this region is that the cartilages of the seventh, eighth, and ninth bulge outward somewhat, and form a distinct elevation just above the thoracic arch, almost as if the lip of the arch turned outward, as in

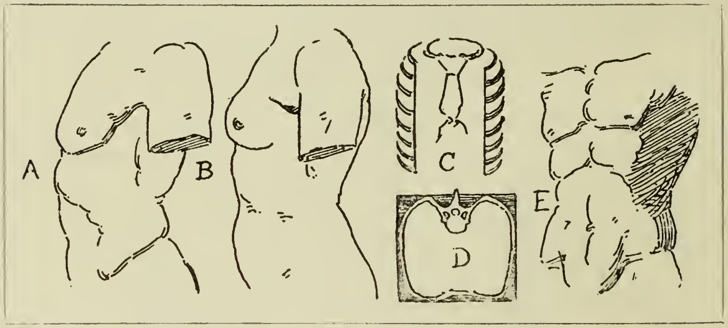

Fig. 81.

Fig. 81, A and B. Without this projection or bulging, the torso, in this region, looks tame.

The greatest projection forward is at the cartilage of the seventh rib.

There is considerable flatness both on the front and sides of the thorax, flatness which is emphasized when, the flesh being added, it can be called the chest. If in a front view of the thorax, a vertical line be drawn upwards for the point of the ninth rib, this line will represent the position of distinct bendings of the ribs from the sides round on to the front (C). Indeed when the Noah's-ark makers flatten Mr. Noah's chest, they suggest an anatomical fact which the skeleton of the patriarchal original would have demonstrated. And again, the modern flat shirt-front is fairly harmonious with the bony facts beneath it, and the "Sailor's Knot" necktie not unlike the breast-bone which it covers.

If a section (D) of the thorax be taken, the flatness both of the front and sides will be distinctly shown, as also will the fact that the thorax is slightly wider than it is deep from front to back.

40. Bony Forms of the Back. The Vertebral Column.

A GREAT deal can be said about the vertebral column, but it is probable that the draughtsman may gather all he needs to know from the diagrams, with one or two words. If the sacrum be omitted, and the movable part only thought of, the form from the side view will be thrice-curved, somewhat after the manner of Cupid's bow, or of a mouth. The lower part, from the greatest projection backward, is longer than that above, and the curvature is straightest where the four or five lowest ribs are attached.

Its undulating shape is due to the constant attempt of the column to get beneath the masses, and thus ensure the erect position. The column must be situated somewhat at the rear of the thorax and the pelvis, in order to allow the internal organs sufficient space. But in both situations it is placed as far forward as possible. In the pelvis it is represented by its immovable portion, the sacrum, which is placed at a considerable inclination, and so, reaches well forward at its upper part, leaves plenty of space before it, and yet is sufficiently high at the back not to produce a sinking or hollow between the adjacent iliac crests. Indeed it is not too much to say that across this part of the back there lies a surface smoothly curved in the direction indicated by the dotted lines in the diagram (Fig. 83, A), more particularly in the female. In the back itself there are two masses, one on either side of the back-bone, and these two masses are produced by the ribs

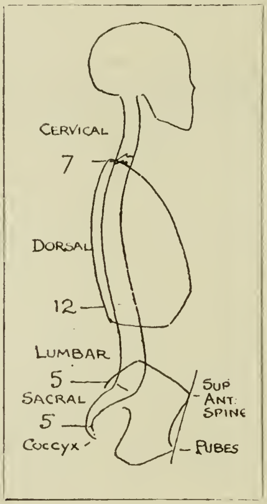

FIG. 82.—Outline of the Vertebral Column.

passing backward for some distance before they take their normal forward course. (Fig. 83, B.) Or, it may be said that the back-bone, to get well under the weight it has to support, holds a position as far forward in the thorax as possible, and thus, as it were, drags the ribs in some distance with it. There is therefore formed a trough with the spines of the back-bone projecting from its central depth. The point on the rib where its direction changes from backward to forward is the *angle* of the rib, and the angles together form almost vertical lines, which become the crests or summits of the two large masses originally mentioned. The trough between them is about six inches wide, the inner borders of the blade-bones coming to the edges.

In a side view of the skeleton the spines of the vertebral column project slightly beyond the mass of the ribs, but when the flesh is added the masses project beyond the spines, for the spines are not covered by muscle.

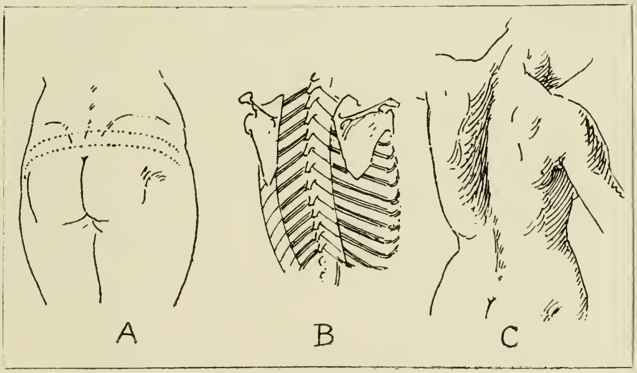

FIG. 83.

Of all the spines the vertebra prominens is the most prominent. Beneath it one or two of the uppermost of the back also show; then in the centre of the back none show, but those of the lower part of the back gradually come into evidence, as also do those of the lumbar vertebræ, of the loins.

The skin and the tendinous edges of the muscles are held down by the extremities of the spines, and hence while when the back is bent forward the "buttons" show very distinctly, they produce dimples when the back is bent backward, with the flesh between them bulging up. These remarks apply chiefly to the lumbar (loin) and lower dorsal (back) spines.

41. Movements of the Bones of the Trunk.

THE whole of the vertebral column can bend backward and forward, but different regions have the power in different degree. Perhaps it is sufficient to the artist to

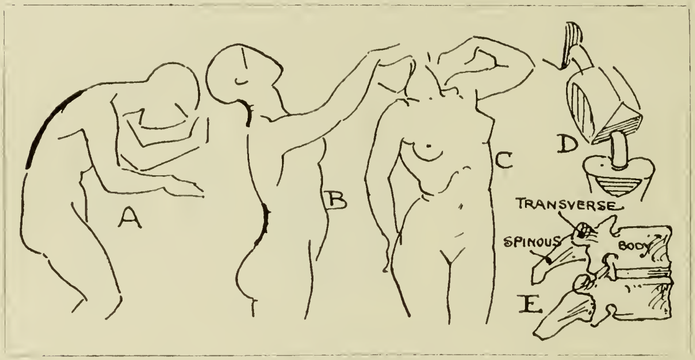

FIG. 84.—The Bending of the Back. Details of Vertebræ.

remember merely that in bending forward, the back, or rather its middle and lower part, bends most, the loins and neck hardly appearing bent at all. In bending backward the reverse holds good, the neck and the loins do the bending. In bending sideways, the loins have precedence ; in twisting, the back.

The vertebral column as a whole may be likened to a pole of india-rubber, having limited movement in all directions. This is due to the elastic intervertebral cartilages, which are discs corresponding in size, but not in thickness, to the centra or bodies of the vertebræ, between which they are situated as mortar between bricks (E).

In the limitations of movement given above due attention has been paid to the incumbrance of the ribs before, and spinous processes behind. The cage of ribs is not rigid, but allows slight compression and expansion. The body must not be twisted so much as to make the shoulders at right angles to the hips.

42. The Erector Spinæ and Sacro-lumbalis Muscles, and their Effect on the Sacrum.

THESE two muscles run from the sacrum and the adjacent end of the iliac crest, to the ribs, and are the representatives in the loins of a group of muscles passing from the lower extremity of the vertebral column up to

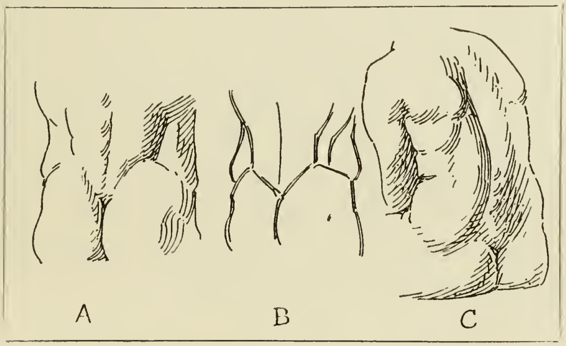

FIG. 85.—A and B, Effect of Erector spinæ. C Lateral volume in the Female.

the head. Their effect is to produce a muscular column on either side of the back-bone which greatly strengthens in appearance the region of the loins.

These muscles are deep, being covered by the *Latissimus* *dorsi* (see next paragraph); but they nevertheless provide the strong masses spoken of, which are chiefly evident when the back is bent backward.

It is important to notice that the attachment to the sacrum covers the whole bone, and therefore the surface of the sacrum becomes modelled into two masses with a hollow between, in accordance with all the muscular forms of the back; and this double modelling is observable in a figure standing in a normal attitude.

In women the sacrum is nearer the surface than in men, appearing as a broader smoother mass. In men, it is set deeper, the iliac crests slightly overshadow it, the gluteal masses further encroaching upon its size.

In a previous paragraph attention has been called to the smoothness of the surfaces passing over the sacrum from side to side. It may here be further noted that in the erect position, when the figure stands upon both feet equally, the strain of the gluteal muscles and of these now under special observation, interfere with the smoothness somewhat. But if the figure stand upon one foot only, the mass becomes very smooth, particularly in the female.

The student will not omit to recognize the dimples formed on either side of the sacrum, by the superior *posterior* spines of the iliac crests—two dimples which, with the noticeable hollow which commences the gluteal crease, form an almost equilateral triangle.

43. The Latissimus Dorsi Muscle.

Among the fashions in ladies' dress which have historically repeated themselves, is that of wearing a small shawl over the back, not over the shoulders, and supporting it by throwing the forward extremities over the arms.

Possibly such shawls slip down from the shoulders, but at all events they have continually been so worn both in ancient and modern times. The Latissimus dorsi, or great dorsal, is in form and position very suggestive of this fashion.

The muscle asserts itself in a variety of ways which will have to be studied separately. In the first place, its very extensive aponeurosis must be noticed. It may be said that where there is aponeurosis there is no muscle,

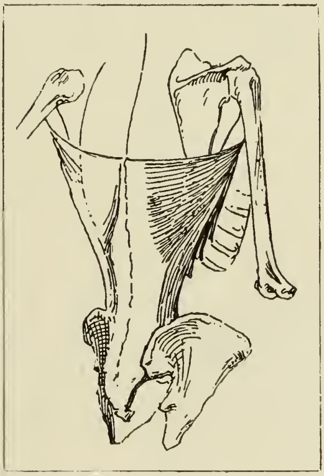

FIG. 86.—The Latissimus Dorsi.

Attachments—By an aponeurosis to all the spines of the back-bone and sacrum down from the sixth of the back (from the middle of the back), also to the posterior third, or more, of the iliac crest, and lowest three or four ribs—bicipital groove of the humerus.

and that the border of the muscle, artistically speaking, is the line dividing the muscular fibres from the aponeurosis which supports them, and provides their means of operation. Hence the curved line, rounding off the back, so frequently seen. (Fig. 87, A.) It will be noticed how gracefully this aponeurotic line continues into the iliac crest, and so into the outline of the thigh. The anatomical diagram shows a stouter and completely fleshy thong of the muscle at its outer edge. This thong is one of four or five forming the anterior part of the muscle, the others attaching to ribs (G). The posterior part is, as

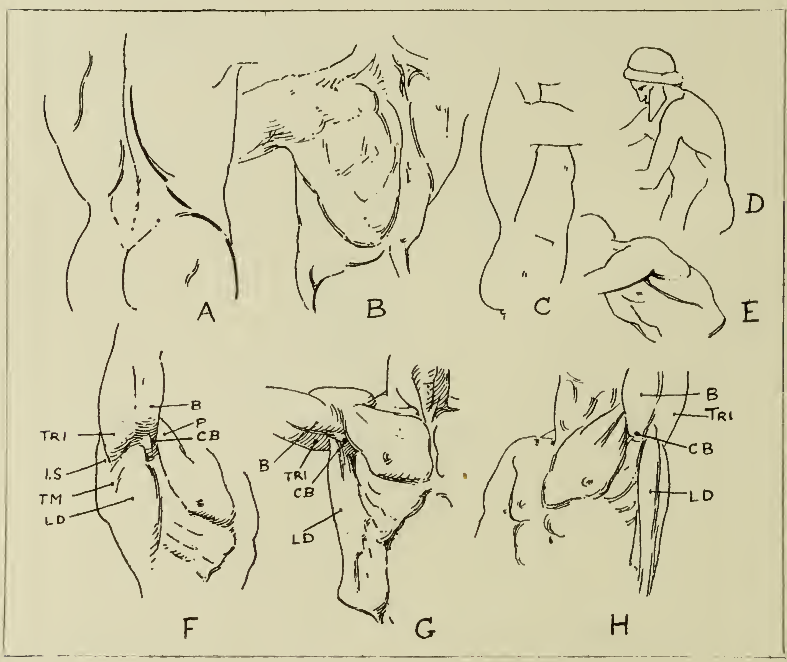

FIG. 87.—Effect of Latissimus Dorsi.

has been shown, flat and sheet-like; the anterior part consists of a number of fingers or thongs, and operates most directly in such actions as chopping. The thong which reaches the iliac crest is most frequently in evidence (B, C, D and E), being particularly strongly marked when the arms are held forward, not that it assists at all in that operation, but because it is stretched forward and makes a very noticeable fold. In the Greek vase paintings, the side view of the arm, if held forward, is generally continued above by a line representing the inner border of the trapezius, and below by a line representing the longest thong of the great dorsal (C). In this action the long thong wraps over the shorter ones and hides them. If, however, the arm be held out sideways, and pull downward, these others will be exposed, fitting in with similar digitations from the external oblique muscle which arises from the iliac crest below (G).

It might almost be said that there is a twist in everything, bone, muscle, or tendon, in the body. It is safest certainly to assume that things are not straight. Thus it must not be thought that the long thong of the dorsal finds its insertion on the iliac crest immediately under its attachment to the arm. If this were so, there would be a sharp fleshy angle formed by this thong, from the arm to the crest, whenever the arm was raised sideways or backwards. The thong's course is however twisted. Viewed from before one may only see its upper part, and it is indeed safest to imagine that it concludes at the waist as the smaller thongs do.

This accords with the fact that the muscle is most voluminous just under the arm-pit, forming a mass which adds greatly to the quality of being well-fleshed and heroic in build—marked L D in diagram F.

The way in which the muscle attaches to the arm will be found treated in paragraph 56, p. 171.

44. The External Oblique and Rectus Abdominis Muscles.

THESE muscles complete the wall of the abdomen, and are concerned in drawing the thorax down to the pelvis, or bending the back forward and twisting the trunk upon itself.

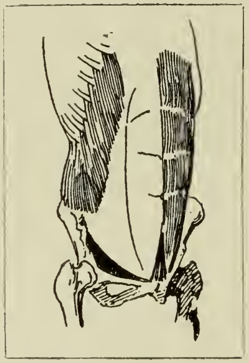

FIG. 88.—Rectus Abdominis, and Obliquus Externus.

Rectus abdominis. Attachments—Pubic crest and symphysis—fifth rib, fifth, sixth, and seventh costal cartilages, and xiphoid appendage.

Obliquus externus. Attachments—By digitations, which interdigitate with those of the latissimus dorsi and the serratus magnus, to lowest eight ribs—anterior half of iliac crest, and the abdominal aponeurosis.

The rectus is not only divided vertically into two symmetrical halves, but is also divided transversely by three or four similar aponeurotic lines, one at the umbilicus, two above it, and sometimes a rudimentary one below it, the fleshy masses bounded by them being very distinctly seen.

The rectus is enclosed within and covered by an aponeurotic sheet, which at its lateral borders gives attachment to the external oblique, the shape or outline of which muscle is consequently given by the conjunction of its fleshy fibres and the aponeurosis.

If a front view of the trunk be taken, the two great muscles of the chest will be seen forming by their lower borders a horizontal line, at the level of the end of the breast-bone, the pit of the stomach. From this horizontal line the rectus falls vertically down to the pubes. Its borders occupy about the quarter positions across the

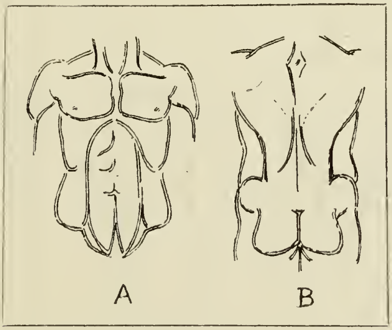

FIG. 89.—Lines of the Front and Back of the Trunk.

whole trunk, but do not run as distinct lines right up to the pectoral. Their form first becomes distinct at the edge of the thoracic arch. From this point the border of the rectus falls in a graceful curve to the pubes, while the border of the fleshy mass of the external oblique, starting with it, diverges tangentially from it, and finally describes an arc of considerable rapidity, and arrives at the superior anterior spine of the iliac crest. (Fig. 89, A.)

In the back view a medial mass, similar to that of the rectus before, is observable. (Fig. 89, B.) This mass consists of the erector spinæ and sacro-lumbalis, with the latissimus dorsi upon them, as explained in paragraphs 42 and 43. The long fleshy thong of the latissimus passes from the arm-pit down to the posterior end of the iliac crest, where it outlines the medial mass. The iliac crest is seen as a voluminous curve upon which the external oblique fits, and forms the side of the abdomen, while its digitations above make a series of little mounds similar to those of the serratus magnus, and lying between them and the prominent edge of the thoracic arch.

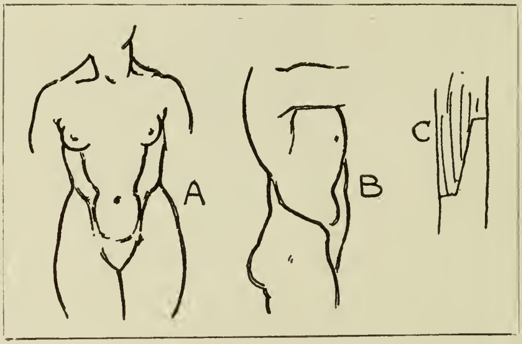

Fig. 90.—Fitting together of the Trunk and Thigh.

Throughout the figure it may be observed how the different parts run on to each other, and seem fitted together in the most secure manner. Just as in joining two pieces of wood together, a more secure joint is effected if the surface of contact be diagonal and not immediately transverse (Fig. 90, C); so a similar arrangement is observable in the construction, as viewed externally, of the human body, and possibly of every organic structure in the world.

In the side view of the trunk this mode of fitting together is exemplified. (Fig. 90, B.) The abdomen runs down, just as the back of the thigh runs up into the cord-like masses of the erector spinæ. The longer and forward line of the iliac crest assists by its inclination in the same idea. The external oblique is thus distinctly, with the rest of the abdomen, in front.

In the antique the external oblique always appears well developed, hanging somewhat over the iliac crest. (Fig. 91, A.) In most moderns, as every one knows, it is disappointingly meagre, the crests not infrequently making the greatest projection in this region. Even when it is tolerably well developed, and shows a convex curve, the

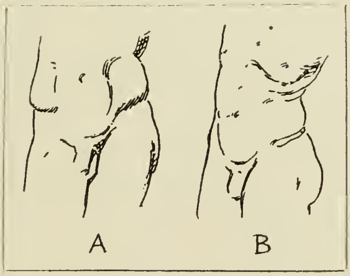

FIG. 91.—Effect of the External Oblique.

crest is evident beneath it. It is perhaps well to always express this bony ridge, and not to attempt to hide it under the external oblique, as if one thereby were keeping to the ideal form. The Greeks knew all about the iliac crest, and suggested it even when they made a great deal of the external oblique.

In some poses, when the figure stands upon one leg, and rolls the trunk over that leg, the oblique assumes a volume similar to that which is in so many antiques the normal mass. The other oblique is at the time stretched, and the crest asserts itself.

The central division of the rectus is replaced at its lower end by a small muscle, pyramidalis, which, arising from the pubic bones, stretches some distance up the aponeurotic "linea alba," or white line, which forms the central division. This little muscular addition greatly improves the lower part of the abdomen by neutralizing the slight furrow made by the white line. (Fig. 92.)

45. Other Details of Abdominal Form.

If a section be taken of the trunk, say, through the pectoral, at 1, Fig. 92, it will be somewhat as shown in the diagram. It will be more or less oblong, square in front, since the thorax itself approaches this shape, as has been shown in paragraph 39, and since the volume of

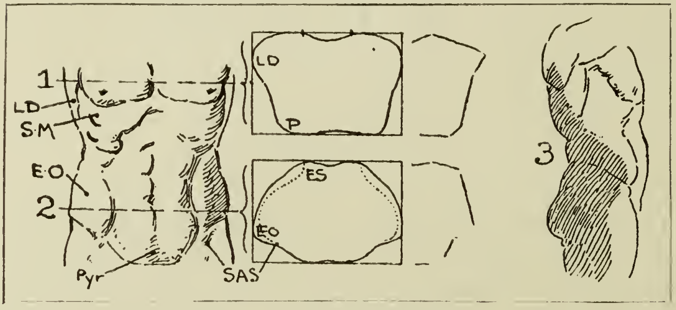

Fig. 92.—Sections of the Trunk.

the pectoral assists by providing more corner to the square. The back corners are swollen out by the latissimus dorsi. So that the section is, broadly speaking, a modified oblong. The section of the abdomen (2) is quite as deep from front to back, in the male, in proportion to its width, as the chest. Thus if the depth be represented as 2, and the width as 3, the figures will apply approximately both to chest and abdomen. But the abdomen is in section less nearly a square; its depth is not maintained, but being produced by the projecting rectus, which is not wide itself, is limited to the comparatively narrow summit of the abdomen.

The external oblique provides a very important portion of the section, and, if flatness may be spoken of, presents a somewhat flattened front and side. It has before been pointed out, page 116, that the iliac crest is in shape,

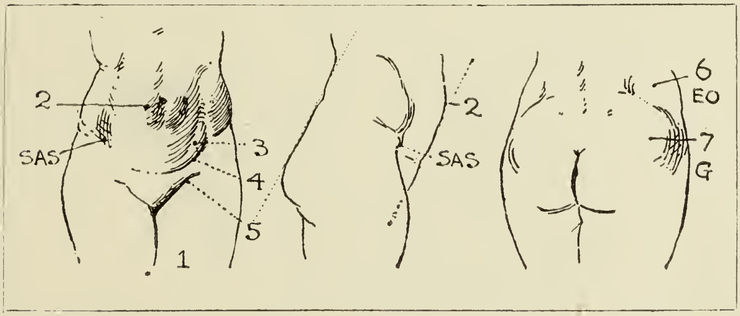

FIG. 93.—The form indicated by the dotted lines in No. 2 is peculiar to the female.

as seen from above, a double curve, part convex outwards, forming the side of the hip. The convex part is the larger, and passes round from the front to the back. Therefore in a direct front or back view, part will be seen, and part not seen. Thus the greatest width or outline-forming line is forward in the abdomen, but, it may be noticed, situated toward the back in the upper part of the trunk. This outline-forming line will, of course, be the shadow line when the light falls from before or behind; the shadow is therefore added in the diagram. (Fig. 92 (3).)

Nothing is more offensive in the figure than a huge stomach. Refinement can easily be attained by adhering to the muscular forms, and by keeping the abdominal mass well within the groin. Flatness is, however, as objectionable in this region as gross fatness. The secret seems to be that the greatest prominence is just below and beside the umbilicus. (Fig. 93 (2).) In women particularly there is a noticeable prominence here, but it is of restricted area, and that is the important fact to observe. The lateral limit of the rectus will assert itself, the external

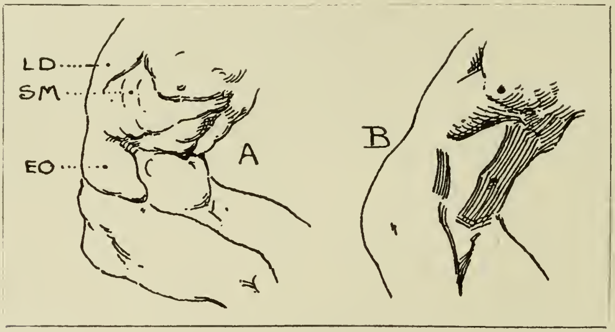

FIG. 94.

oblique also, and between and below them the slight surface (3), completing the mass to the groin (4). Below the groin is the last fold of the trunk, with the lower border becoming a crease in the thigh (5). In the side view the chief prominence of the abdomen naturally is very well seen.

The greater proportional width of the female pelvis gives this region an increased flatness, which is further augmented by the fact that the iliac crests project further forward. When the torso is bent upon itself the transverse divisions of the rectus assert themselves as creases between the muscular masses; the thoracic arch also comes into evidence, expressing itself by the wavy line of the costal cartilages of the eighth, ninth, and tenth ribs, the floating eleventh helping to carry the line round towards the back. The èxternal oblique bulges up boldly, taking probably an undulating curve where it borders against the abdomen. Below the umbilicus the abdomen is generally clear, but the skin sometimes creases; the groin will lie between the mass of the abdomen above and the last fold below, as a dull depression.

In some cases the abdomen appears to have a section somewhat square presenting three surfaces, two of which appear in Fig. 94, B. The abdominal mass thus indicated is limited by the border of the thoracic arch and the external oblique.

46. The Pectoral Muscles.

THE pectoralis minor is almost entirely hidden by the pectoralis major, and perhaps it only asserts itself when the outward border of the latter is exposed, by thickening that border, and preventing any deep hollow behind it. (Fig. 95 (3).)

The form of the pectoralis major may be gathered from the diagram. Its arrangement in bundles affects external form, as may be seen in Fig. 96, while the uppermost bundle barely touches the deltoid, page 150, so that there is a slight channel between them.

The twisting of the tendon is of great value artistically, as it does away with the horribly sharp angle which would be present did the lower fasciculi of the muscle proceed to the lower end of the insertion instead of to the upper. Let it be noted that the lower part of the muscle passes under the upper.

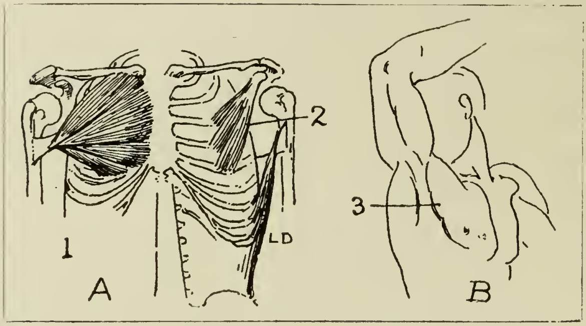

Fig. 95.—The Pectoral Muscles.

Pectoralis Major. Attachments—Aponeurosis of external oblique muscle of abdomen, front of body and hilt of sternum and adjacent costal cartilages, and inner half of collar-bone—bicipital groove of humerus.

Pectoralis Minor (2 and 3). Front of third, fourth, and fifth ribs—coracoid process of scapula.

47. The Breast.

The male breast takes its form from the pectoral muscle with the rudimentary glands about and below the nipples, which convert the *roundish* lower corner of the muscle into a squarer shape. Compare Figs. 96 and 95. Fig. 96, c is from a thin model, and the squareness is lost.

The lower and external borders have considerable prominence, the external being of the two the more pronounced. In well-developed men, the external border, passing up to the arm-pit, is a fold of considerable volume, being augmented by the pectoralis minor beneath it, and tending to express itself the more because it stretches out beyond the thorax, proceeding as it does to the arm-bone. This external border presents a single though undulating line, when it is seen in its extent, as when the arm is raised. When it is crushed up, as when the arm is at the side, it folds in a direction contrary to that of the fasciculi.

The lower border is shallowest towards the centre of the figure, and falls a little as it proceeds outward.

In the male breast the ridge at the junction of hilt and body of the sternum asserts itself as a bony promin-

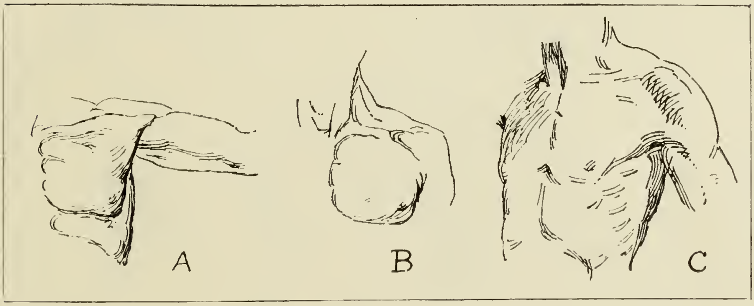

Fig. 96.—The Male Breast.

ence with a horizontal direction. The end of the sternum, where the xiphoid appendage succeeds to it, is also evident, making an irregular sharp curved depression with its concavity downwards.

It is pointed out, page 146, how that there is comparatively little space between the head of the humerus and the thorax. Hence there is no "space to spare" between the mass of the breast and the shoulder-cap muscle, the deltoid; and one form crowds closely upon the other, leaving no room for a fold, as is to be seen in the female.

In the female breast the forms produced by the mammary glands, the breasts proper, dominate the general shape. The pectoral muscles are lost. Between the breasts is a slight indication of the lower end of the sternum. The space above them is clearly modelled from the top of the shoulder, but is in two masses, being divided by a depression corresponding to the sternum, or rather to the subcutaneous part of that bone between the pectoral muscles. The ridge at the junction of the

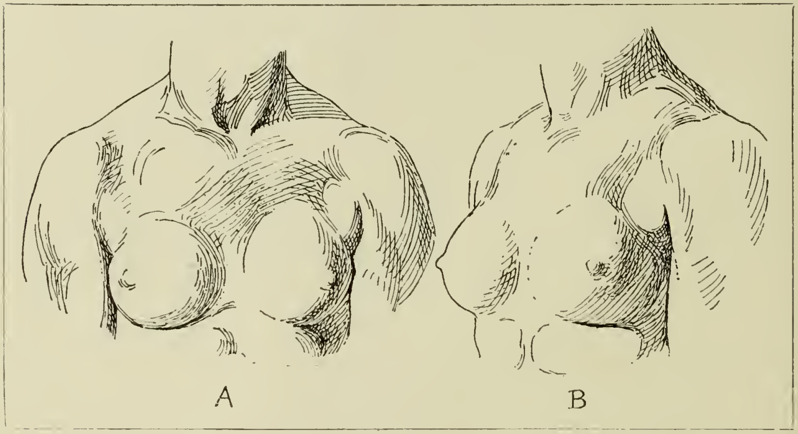

FIG. 97.

hilt and body of the same bone will only be apparent when the superficial fat with which each well-nourished woman is assumed to be endowed, is below the standard quantity. This is due to the fact that the bony asperities are softened in the female sternum, as throughout the whole figure.

There being considerable space between the thorax and the arm-bone in the female, a distinct hollow may be observed between the chest and the shoulder. This space admits a voluminous fold to form between the breast and the arm-pit. This depression between the chest and shoulder, in conjunction with certain other peculiarities of the female skeleton, produces another general characteristic of the female figure. The peculiarities of the skeleton are these. The breast-bone is shorter proportionally than in the male, the diminution dragging the pit of the neck, the collar-bones, and the forward end of the first pair of ribs down, while the posterior ends of the first ribs remain at the same height up the neck as in the male. The result is that from

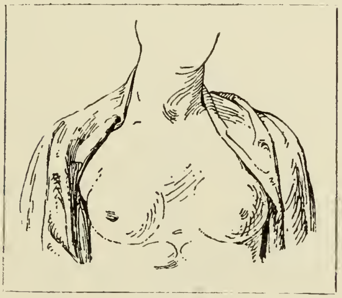

FIG. 98.

the sloping line of the trapezius is a gentle fall down the lower part of the neck over the collar-bone almost without a break of surface, and down in the same gentle manner over the bosom and between the breasts. In the male the form is broken by the collar-bone, which stands higher, and thus produces two surfaces, one being the horizontal part of the neck, the other the chest. It is thus that a man's bosom becomes unsuited to low-necked costume. In the fifteenth century men wore what for men may be called low necks, but they stopped at the collar-bone.

The hollow which has been pointed out as due to the distance between the head of the humerus and the thorax in the female, divides the bosom and breast from the shoulder and the mass of the trapezius. The shoulder and trapezius thus brood forward like the wing on a bird. Hence the bird-like appearance of protection in the breast of a woman. In Fig. 98 this brooding shoulder-piece is clothed, and thus the masses are

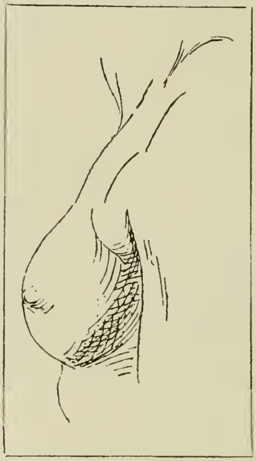

FIG. 99.

emphasized. The outline of the drapery corresponds to the inner borders of the trapezius and deltoid muscles.

The two breasts proper (female) are directed somewhat outward, not immediately forward. If axial lines be drawn through them, they will meet at about right angles. (Fig. 100.) So that when one breast is directed straight towards the spectator, the other is seen in profile if the spectator be but a foot or two away. (Fig. 97, B.)

The outline of the breast is, roughly speaking, a semi-circle slightly drooped. The nipple is a little lower than the centre, though sometimes, and in the antique, rather higher, while the curve above it is flattened, and the curve beneath proportionally increased in roundness. This slight droop is due to the lack of rigid support within the breast, and it is not improbable that the degree of support naturally provided is lessened by the modern fashion of always providing an artificial one, whether it is wanted or not. In the ideal figure, as exhibited in the antique and in the best living models, there is no crease at the under side. This crease, due to a great

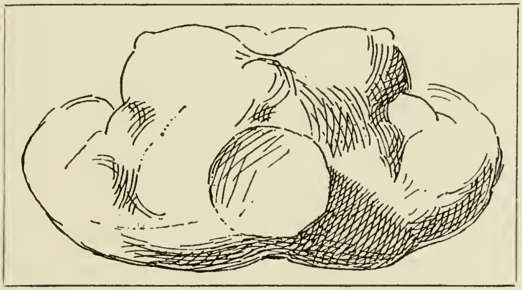

FIG. 100.

laxity of the region, is religiously affected by a section of modern artists, as being a distinguishing mark of artistic truth. In the sixteenth and seventeenth centuries it seems to have been a fashion to brace the breasts up so as to form a palpable upper border, where there should be only the subtlest suggestion; while at about the middle of the last century there was a hideous fashion of doing away with what an old writer very well calls these "beautiful knolls." The folds between the breasts and shoulders make against the breasts sharp creases slanting downwards and outwards, and in direction pointing to the pit of the neck. These creases, fairly straight in line, help to express the softness of this part of the bosom, but are of course only seen when the shoulders are drawn forward. The draughtsman's aim must be to represent this feature of the trunk as soft, drooping very slightly, and not too spherical. From the front view the nipples are seen toward the outer side of the mass. The breasts should not meet, but should have a softly defined space between them.

48. Comparison of the Bones of the Trunk in the Two Sexes.

THE thorax is comparatively larger in the male, less ovoid, its sides more vertical, being indeed virtually so

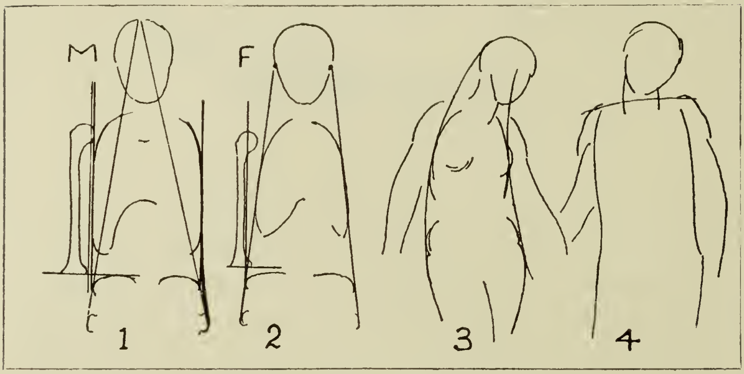

FIG. 101.—The Trunk in the two Sexes.

from the third to the tenth rib. It is of greater capacity, having a greater width in the upper region, and hence leaving less space between itself and the head of the arm-bone than in the female. This fact is of importance;

the effect of the difference being pointed out in the paragraph on the breast. The pelvis is wider in the female.

The difference between the sexes is perhaps best illustrated by drawing lines touching the trochanters and iliac crests. In the female this line will skirt the thorax in passing upwards, and will strike the head at the zygoma (2). In the male the line will cut through the thorax and the head, and meet its fellow from the other side, at the summit of the cranium (1). Thus, the female skeleton is seen to be pyramidal. If other lines be erected vertically from the iliac crests, the one in the male will skirt the thorax on its inner side, and the head of the arm-bone on its outer. In the female the line will escape the thorax, and will cut through the head of the humerus.

The annexed diagram will illustrate the application of the rule. The tall pyramid of the female (3) will become curved in accordance with the bending inevitably present in all but diagrammatic poses, while for the male, double curves producing a bell-shape (4) will be serviceable.

49. The Waist.

THERE is more space between the thorax and pelvis in a woman (B), and therefore there is more waist. The width is proportionally the same in both, being equal to twice the distance from the bottom of the chin to the lower border of the eyebrow; but allowing for the general inferiority in size of the female, the waist in that size is smaller in a normal figure than in the typical man. This absolute smallness is rendered more evident by the fact that in the typical woman, some inches shorter in stature than the typical man, the hips and iliacs are not only proportionately but actually wider. Thus, the smallness of the female waist is emphasized by the contrast of the hips beneath. The evil habit of tight-lacing, while it affects the figures of the women of to-day, must not be indulged in by the women of our artistic fancy; but it would be, of course, absurd to represent those daughters of Eve who "lace," with the waist of the Venus of Milo. Tight-lacing may be first cousin to Chinese foot-shortening, to the reported cutting off of

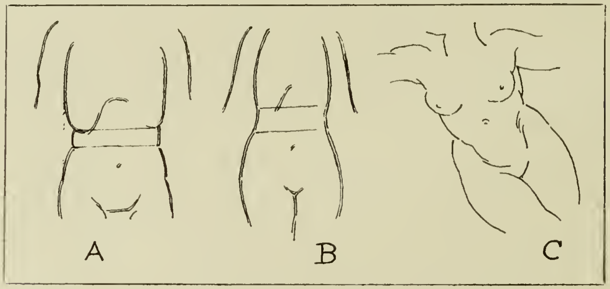

FIG. 102.

all toes but the great toe, and the flattening of the forehead by some other enlightened communities. All may be strides, where Providence has determined to take steps, in the evolution of the human species; but the general opinion of artists has pronounced against them as improvements. If any one cares to study an art of the laced nude, let him betake himself to the British Museum, and there examine the Indian sculptures. It is tolerably certain that he will prefer the Greek.

There is, nevertheless, both in the male and female a degree of diminution downwards in the part of the trunk above the waist, but as regards the bony structure the thorax, the reverse is the fact,—the diminution is upward. Then, with the addition of the muscles the order becomes reversed. The latissimus dorsi very palpably contributes to this effect, particularly in the male. Tintoret appears to have been very fond of fitting the upper part of the trunk, as an inverted cone, into the loins of his female figures (C).

A great deal of the charm of the figure undoubtedly is due to the blending together of contrary facts, as, in this case, the upward diminution of the thorax with the downward diminution of the mass when fleshed.

50. The Shoulder-blade and Shoulder.

THE form of the blade- and collar-bones may be gathered from Figs. 56 and 57; the muscles upon and about them are given in the following diagrams.

Complicated as the shoulder is, there is perhaps little to be gained by a detailed description of it. We will merely note its chief and most obvious characteristics. And first, as to evidences of bone, the collar-bone and the spine of the scapula are virtually a continuous bony ridge, meeting on the summit of the shoulder in the *acromion* process. It will be seen, by reference to the diagrams, that this bony ridge gives attachment to two massive muscles, the trapezius and the deltoid; the former above, the latter below; and between them is a degree of the bony ridge, but much less in width on the spine than on the acromion or collar-bone. Indeed in well-fleshed persons, with the proper amount of fat beneath the skin, the spine should show as a gentle

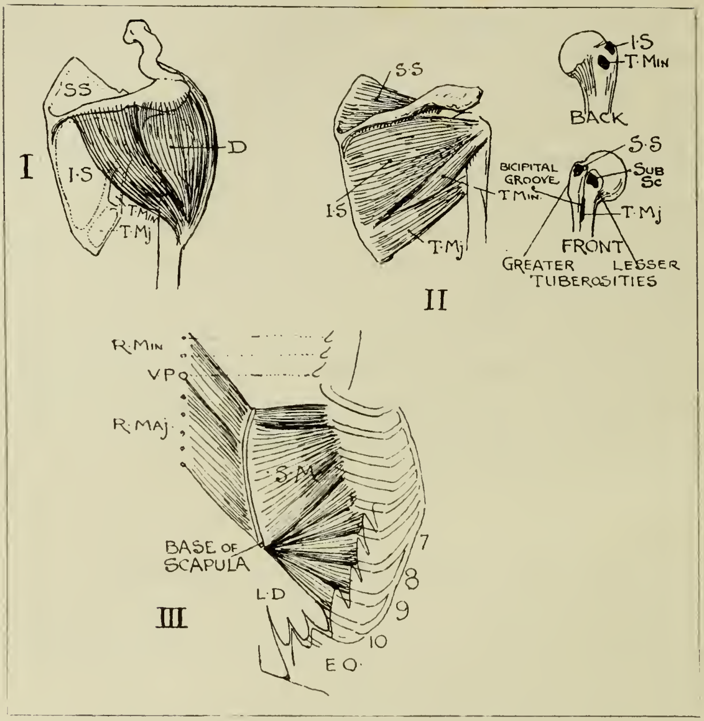

Fig. 103.—Muscles about the scapula.

I. The Deltoid Muscle.

Attachments—Under lip of spine of scapula, and outer third of clavicle —deltoid impression on outside of humerus.

II. The Scapular Muscles.

Supra-spinatus.

Attachments—Supra-spinous fossa of scapula—greater tuberosity of humerus.

Infra-spinatus.

Attachments—Inner two-thirds of infra-spinous fossa—greater tuberosity of humerus.

Teres minor.

Attachments—At the outer side of the attachment of the infra-spinatus—greater tuberosity of humerus.

Teres major.

Attachments—Below the attachments of the teres minor and infra-spinatus—bicipital groove of humerus.

III. The Rhomboids and Serratus Magnus.

Serratus magnus.

Attachments—Upper eight ribs—base of scapula.

Rhomboideus major.

Attachments—Upper five dorsal spines—base of scapula from the root of the spine to the lower angle.

Rhomboideus minor.

Attachments — Lowest three cervical spines — base of scapula above the insertion of the rhomboideus major.

depression rather than as a ridge. It is suggested by straight lines in Fig. 75. In drawings further advanced it is sometimes suggested by the outlines of the trapezius and deltoid, as in Fig. 104, B.

The base of the scapula, its border parallel to the back-bone that is, reveals itself usually as a double curve, as in Fig. 75, or Fig. 104, C, D and E. The lower curve bends round and forms the lower angle of the blade (B and D).

Under the arm-pit there are three radiating lines, shown in Fig. 104, B. The lowest, representing the *latissimus dorsi*, does not touch the blade, whereas the other two arise from it. They represent, the lower, teres major, the upper, teres minor, and what is specially remarkable about them is, that major goes to the front of the arm in close company with latissimus, while minor goes to the back. They are separated by the triceps muscle at the back of the arm. These lines of the teres will be seen to be slanting, or obliquely placed, with the result that the sharp angle which would otherwise occur under the arm when it is raised, or carried at all away from the body, is filled.

The *deltoid* should always be drawn with a double curve, and not left as a ball at the top of the arm. Its border against the pectoral, on the chest, is well marked, owing to a slight hollow between them. Its hinder border is too thin in its upper part to express itself strongly, except when it is in action and raising the arm backwards. Above the arm-pit the hinder border is more voluminous, but preserves a depression between itself and the triceps of the arm.

The scapula is, as it were, slung over the shoulders by

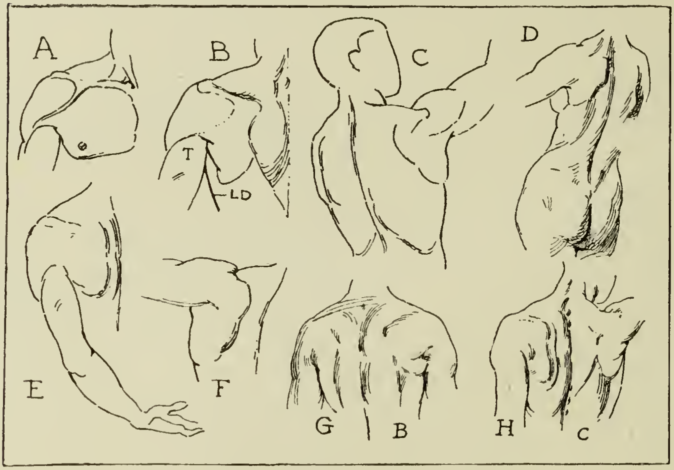

FIG. 104.

the collar-bone, which thus provides the only bony connection with the skeleton.

The articulation between the clavicle and sternum is so mobile as to possess all the movements of a ball-and-socket joint. It will allow slight circumduction, such as the point of one's pen makes in writing the letter O, slight rotation upon the axis of the bone, but chiefly a degree of movement up and down, and backwards and forwards.

The joint between the clavicle and scapula is in effect similar to that which connects the clavicle to the sternum. It allows a general mobility and accommodation to the actions of the arm, but its chief movements are upward, as in shrugging the shoulders or carrying weights upon them ; and downward, and forward and backward, in which two latter the scapula glides over the thorax, arriving sometimes almost at the side of the trunk, and sometimes almost at the back-bone.

Then there is the movement of rotation, as if a pivot were passed through the centre of the blade, though the pivot shifts its position as the action proceeds. This movement is seen when the arm is raised above the shoulders, towards the head, and some degree of the contrary rotation when the arm is cast behind the body. (Fig. 104, C and E.)

But perhaps the most important fact concerning the movement of the blade-bone is the tendency of the inner, or vertical border, or base, to project outward, pushing the skin up. In strained actions of the arm ; when that limb is brought far forward ; and when the shoulders are thrown back, as in dumb-bell exercise, the scapula lies close and tight against the thorax, and the surrounding muscles assert themselves ; but in easy, or perhaps one should say lazy, positions, and when the hands are engaged in some light occupation, the base of the scapula, being loosened from muscular control, projects more or less. It generally appears as two mounds, one at the root of the spine, and one at the inferior angle.

The student of Art History will have remarked how seldom the scapula is permitted to project in the manner here referred to ; it shows, but does not project. Pose has no doubt a great deal to do with this, and in this connection it is interesting to note how frequently in Greek works the position in which the shoulders are well back, with the elbows at the sides, and the hands held a little away, occurs.

The upper part of the back is of all the body the part most liable to change, and it is virtually impossible to lay down rules governing the numerous details which come and go so readily. The spine and base of the blade-bone nestle among a number of subtly bulging masses sometimes very numerous, sometimes very few, and due chiefly to the

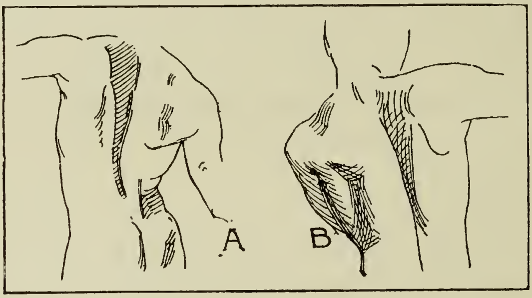

FIG. 105.

muscles on the scapula, the rhomboids between it and the back-bone, and the trapezius. It will be when the arms are brought forward and the muscles at the back are stretched that the form will be simplest; most complex when the arms and shoulders are thrown back. In Raphael's drawings there are generally a great number of muscular "knots" on the back, and Michael Angelo and Cellino were equally fond of them. The essentials of form are however those pointed out above.

Partly connected with the blade-bones is the modelling of the back, as shown in Fig. 105. The flat declivity from the blade to the back-bone is both characteristic and beautiful. Lower down, the back becomes divided, as in B, and as also in D and H, Fig. 104, into vertical masses, the outer of which are produced by the latissimus dorsi.

51. The Proportions of the Trunk.

It has before been said that the trunk is divisible into two halves, at the lower end of the thorax. In the female it is at the exact end, but in the male it is rather at the end of the prominence of the thorax before, at the cartilage of the tenth rib. In the male these halves are each about 12 inches, in the female about 11 inches. In the female the half of the thorax gives the position of the nipples, in the male the lower border of the pectorals.

The proportions are diagrammatically represented in Fig. 19, page 41, which will illustrate the remarks in this paragraph.

In the back the following equal measurements (6 inches) may be noted. From the top of the cranium to the summit of the vertebral column, thence to the top of the scapula, thence to lower angle of that bone, and then to the end of the thorax. (Fig. 19 (2).) In the female these measurements are about $5\frac{1}{2}$ inches.

The scapula is virtually between the same horizontal parallels as the collar-bone and nipples in both sexes.

Contrasting the measurements of the two sexes, it will be seen that the width of the hips is the same in inches in both, although the woman is in stature $63\frac{1}{2}$ inches, and the man 67. The width of the thorax, bone only, is $11\frac{1}{2}$ inches in man, 9 in woman. Across the shoulders to the articulation between the collar-bone and the acromion process is in man 12 inches, in woman less. The acromion processes will add about an inch at each side.

The waist is 8 to $9\frac{1}{2}$ inches in woman, 10 inches in man; the hips across the trochanters 13 inches in both. The female figure is also very wide across the ilia, being 12 inches to $11\frac{1}{2}$ in the male. The greatest width of both figures is across the thighs a little below the trochanters. Taking the centre of the female figure as at the level of the trochanters, we see that from the centre down to the top of the patella, and also up to the breasts, are measurements equal to that across the trochanters. Again, the greatest width of the female is one-third the measurement from the ground to the waist.

In the male the width of the shoulders is supported by a very similar width in the chest and breast, but in the female the chest and breast are much narrower, permitting the arm to hang closer to the thorax, and so the width across the deltoids is in the female about 16 inches, against 18 inches in the male. It also accounts for the "brooding" of the shoulders of the woman spoken of on page 144.

To these considerations have to be added the fact that the female trunk is proportionally longer than the male. This is very well demonstrated by Fig. 19, No. 1, in which half of the outline is male and half female, the umbilicus being taken as the common point for both. By this it will be seen how the thoraces correspond in length, the nipples even falling on the same line. The male clavicle is higher than the female, as is the male summit of the cranium. It is in the lower limb that the female becomes the shorter.

The female thorax is not only narrower, it is slightly shorter. The female pelvis is slightly wider in actual measurement, but not so tall. Hence there is more space between the thorax and pelvis, than in the male.

There may be some little practical value in the diagrams of the proportion of the back, given also in Fig. 19. In the female there are four equal measurements of $12\frac{1}{2}$ inches each; in the male the second is reduced to 10 inches, the others increased to 14 inches each.

THE ARM

52. The First Lines in a Drawing of the Arm.

THE earliest sketch of the arm must include both the shoulder and the hand, particularly the hand, which most beginners seem to regard as something quite different from the arm, and which can be added at any time. That this is a great mistake any one who gives the least consideration to the construction will see at once.

The commencement of the drawing will consist of simple lines on either side of the limb. It is not wise to linger upon the details of form, till the whole arm is built up in simple fashion, and the proportion and action are determined by such means. But these first lines should be true to form, and the draughtsman must be continually trying to compress as much fact as possible into simple and rapidly drawn lines.

Different views of the arm yield different outlines, and the variety is very great, but perhaps Fig. 106 summarizes the most frequent positions. The curves bounding the form on either side are generally somewhat parallel, but some positions require both outlines to curve outwards, as F, Fig. 106. When the curves are parallel, as in the other examples in Fig. 106, the convexity is backward in the side view, as A, C, D and H. In views approaching the front and back, the parallel curves for the (upper) arm will have their convexity toward the figure, as E and G. In these examples will be noticed a slanting line from the arm to the elbow, which corresponds to the massing of the bones of the elbow, as shown in Fig. 108. In H, Fig. 106, the whole arm is within lines convex backward. B is similar, but while the upper line is single the lower is double, and thus expresses by the angle formed the projection of the elbow.

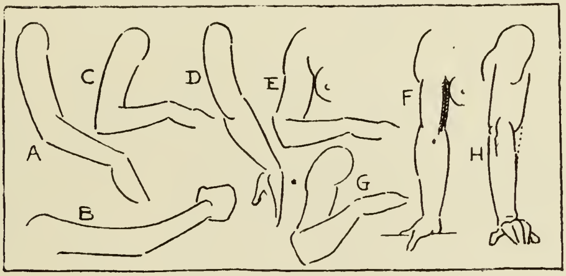

FIG. 106.

The first lines of the hand will be as in A, C, D, E and G, a straight line being placed for the back of the hand, and a graceful curve for the index finger. Before proceeding further with the practical drawing, it will be well to remind ourselves of the bones and chief muscles of the arm.

53. The Bones of the Upper Limb.

THESE are shown in the accompanying diagrams, Nos. 107 to 109. A few characteristics will need to be pointed out. The greater tuberosity of the humerus helps to form the upper bulb of the mass of the deltoid muscle.

The shaft is tolerably straight, and ends in the articular surfaces for the hinge-joint of the elbow. Above the joint the bone is very thin, being hollowed before and

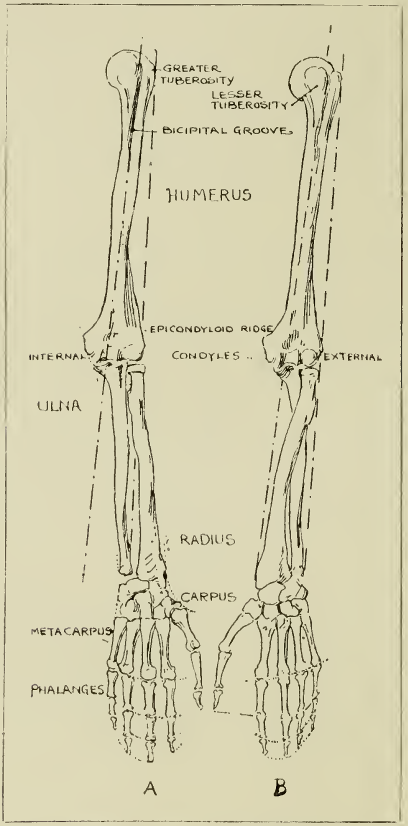

FIG. 107.—The Left Arm. A, Supinate; B, Pronate.

behind, to accommodate the olecranon and coronoid processes of the ulna, when they, in the respective actions of straightening, or extending, the fore-arm, and bending or flexing it, upon the arm, come up against the humerus. Were that bone not hollowed to receive them, the actions would be so far further limited. The hollowing necessitates the provision of powerful lateral support for the articular surface, and this is provided by the epi-condyloid ridges. The condyles in which these terminate are very important to the artist; for one, the external, is the centre of a radiating set of muscles, and consequently of the lines which express them; while the other, the internal, is, generally speaking, always in evidence. The external is in many actions hidden beneath the supinators and

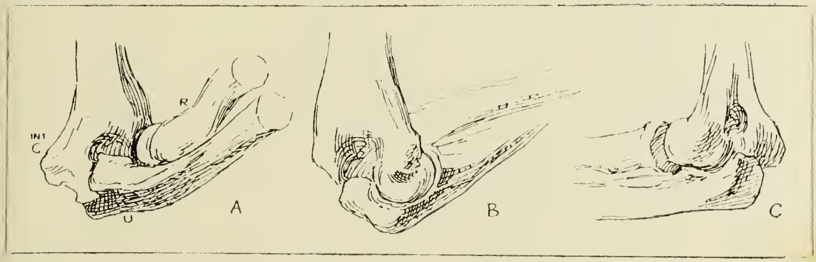

FIG. 108.—The Elbow-joint (left arm).

A, Inner three-quarter view, pronate; B, Inner three-quarter back view, pronate; C, Outer three-quarter back view.

flexors, which pass over the joint on the outer side; on the inner no muscles pass over the joint, and so, except for general fleshiness, the internal condyle is exposed. Another fact connected with the epi-condyloid ridges is that in the fleshed arm they associate themselves with the fore-arm, rather than with the upper arm to which they properly belong. So that, as in Fig. 106, F, the convex outlines of the fore-arm pass up beyond the elbow. To this effect the *supinator* muscle also contributes.

Turning to the side view, the lower end of the humerus will be seen to bend forward a little. The back of its lower end is thus smoothly curved. In the skeleton this smooth curve is suddenly broken by the olecranon process; but with the addition of the muscles and skin, the break is considerably lessened.

Viewing the skeleton of the arm as a whole, the fact that apparently the humerus and ulna form one distinct part, and the radius and hand another, cannot be overlooked. This oblique fitting together of the parts will

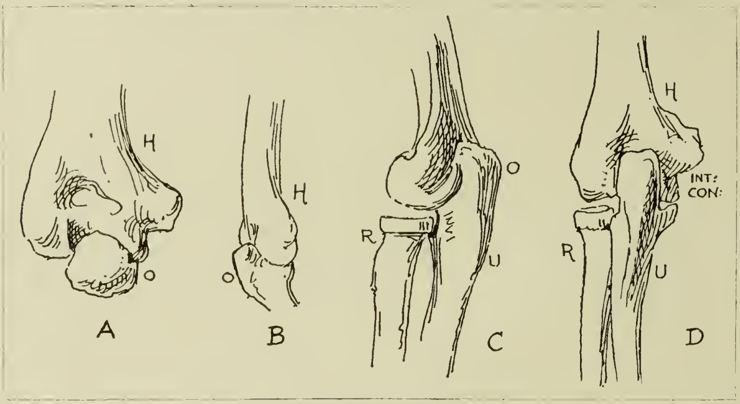

FIG. 109.—The Elbow-joint.

A, Back view of the left elbow, bent; B, Showing how the olecranon grips the humerus, and the curvature of the latter; C, Outer view, left elbow, straightened; D, Back view of same.

frequently be noted in a study of the figure, but nowhere is it so palpable as in the arm.

The elbow-joint depends almost entirely upon the ulna, the lower end of which will be seen to be very similar to the upper end or head of the radius. These smaller ends of the bones have lateral articular surfaces which are concerned in the actions of pronation and supination, which may be briefly described as follows. The head of the radius remains in the same position throughout the actions, but revolves. The lower end of the radius, during this revolution of the head, works against the lower end of the ulna, which does not participate further in the action, and so is carried half-way round the ulna, or, as may be said, over it. When the thumb is outside, the arm is in the position of supination; when it turns in towards the thigh, it is in pronation.

The pronate arm is much more nearly straight than the supinate. This is due to the slight obliquity at which the ulna is placed to the humerus, an obliquity demonstrated by drawing a line level with the greater tuberosity of the head of the humerus and the external condyle; it will touch the outer side of the lower end of the ulna. (Fig. 107.) In supination the radius is to the outside of this line, and thus produces an obtuse angle with the humerus, the external epi-condyloid ridge being in continuation with the line of the radius, and the angle thus occurs about a third of the length, upward, of the humerus. This is worth observing, as the final muscular form is suggested by it.

If a line be drawn as axis to the humerus, it will be seen in supination to be considerably to the inner side of the wrist, but in pronation the wrist comes up to it. Even in pronation then, the axis of the fore-arm is not quite in line with that of the arm, but deflected a little to the outward.

Pronation is an auxiliary *rotation* of the arm. Rotation, as the word implies, is a moving round upon the axis. If the two bones of the fore-arm were rigid, the palm could only be turned downward if the elbow-joint itself contained the power of rotation. Such a change would entirely destroy the strength of the limb. Pronation being a kind of rotation is nearly always accompanied by rotation of the humerus, which is of course easily performed at the loose shoulder-joint. So that when the thumb is turned over toward the body (pronated), the elbow projects at the side, outward; and when the thumb is carried back (supinated), the elbow is drawn in close to the trunk.

54. The Triceps Muscle.

THIS important muscle covers the whole of the back of the arm, the details of which are the details of its form and construction. Its office is to extend the forearm, on the arm, and for this purpose it is attached to the strong olecranon process of the ulna. Its attachment also to the scapula gives it power of drawing the arm towards and behind the trunk.

The form of the muscle may be gathered from the accompanying illustration, and only a few words of explanation will be necessary.

In the first place, the common tendon by which all three heads are attached to the olecranon is of considerable length, reaching nearly half-way between the olecranon and the acromion, as shown in Fig. 111, A. Omitting the junction of this tendon with the olecranon, it has three sides, two very long and virtually parallel, expressing the length, while the third, which connects them at the top, is inclined downwards toward the outside. The depression due to this short slanting border is one of the most noticeable characteristics of the muscle. When the muscle is in repose it dies almost away, and is most evident when the muscle is in powerful action.

The tendon from this slanting "hollow" to the olecranon is nearly flat, being slightly bulged by part of the inner head beneath it. The tendon joins on to the olecranon, with the result that the olecranon appears more a part of it than a part of the ulna bone, a deception which is assisted by a slight depression under the elbow. Nothing could be worse than to suggest in a drawing of a bent arm that the elbow projected backwards as in Fig. 111, C. Such is typical of lower animals, D.

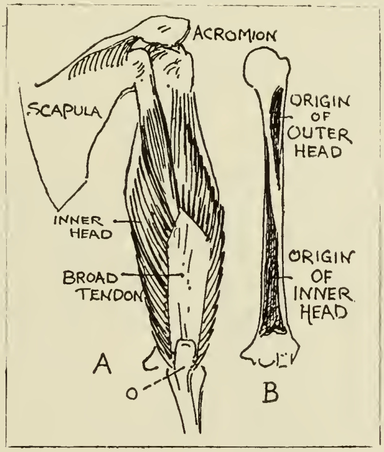

FIG. 110.—The Triceps Cubiti Muscle.

Attachments—Middle head, beneath the glenoid cavity on the neck of the scapula; outer head, outer side of upper half of shaft of the humerus; inner head, inner side, and below, the back of the shaft of the humerus—upper border and sides of the olecranon. B shows the origins of the outer and inner heads on the humerus.

A fringe of muscular fibres runs down either side of the tendon raising the borders, and thus rendering this lower part of the muscle somewhat flat, while at the same time it makes three surfaces of modelling, one for each fringe and one for the tendon.

The *outer* head is the higher in position of the two which arise only from the bone. But this precedence is wrested from it by the middle head in conjunction with the inner. These form a mass which overshadows the outer, although it is the largest of the three. The mass thus formed, as soon as it emerges from under the deltoid, spreads out toward the trunk as if it had need of the space provided under the arm-pit. It will be wrong therefore to draw the internal line of the arm,

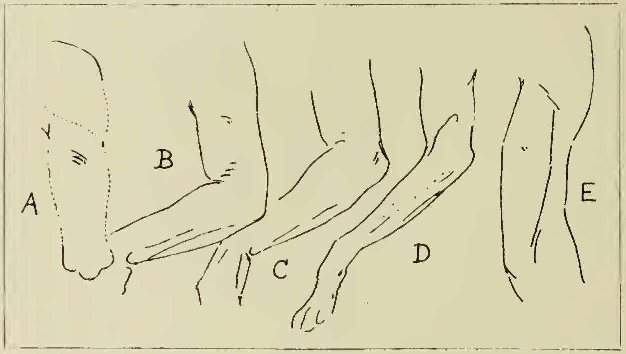

FIG. 111.—Effect of Triceps.

representing this mass, from the arm-pit to the condyle, as even a tolerably straight line. It must press inward, almost as if it were following the course of the latissimus dorsi. Then it must as suddenly return, and with one or two slight roundnesses arrive at the condyle. The outline of the outer head is very similar. Commencing lower, it passes outward and then inward. And thus the triceps takes somewhat the form of a coffin, if the extreme angularity of that ugly piece of joinery can be forgotten (E).

The outer head and the inner mass can hardly be said to commingle. Even when they seem to form one smooth surface, it is evident that a degree of precedence attaches to the inner part. In muscular men there is a distinct depression between them, and the inner mass is seen to grow into the middle head which carries

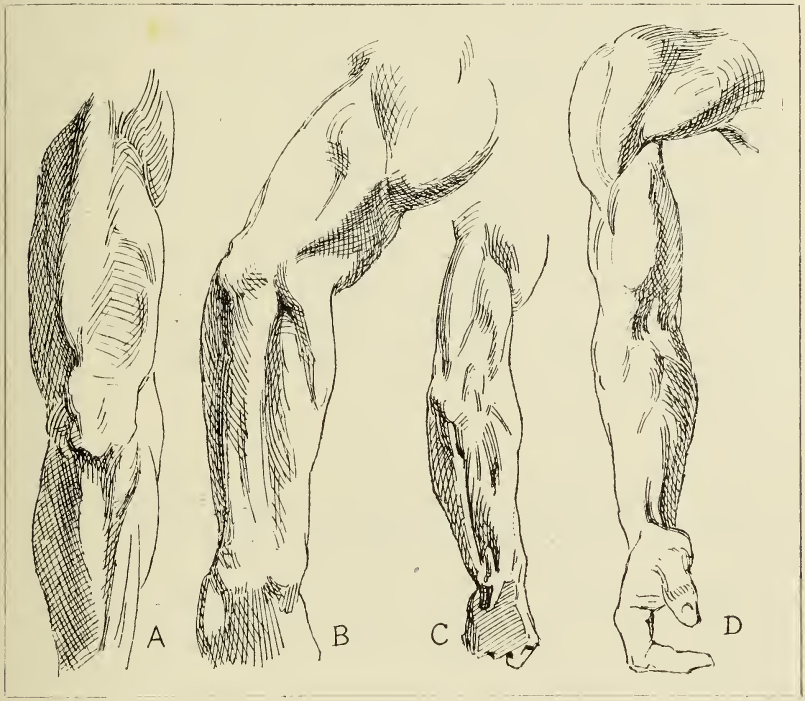

FIG. 112.

it on up under the deltoid, which it sometimes slightly raises. The outer head, finishing, in fact, as well as in appearance, at the deltoid border, shelves down, and so accents the groove between it and that muscle.

The outer head, with the "hollow" beneath it, is perhaps the most noticeable of all the details of the triceps. It produces a bulging, *obliquely* placed, skirting the edge of the deltoid, and passing from the back to the front, or rather to the side, of the arm.

A muscular arm is in its section roughly triangular. One side of the triangle will face the trunk, being limited behind by the middle head, and before by the summit of the biceps; one side will face somewhat backward, and extend from the middle head to the outer head, while the third side will extend from the outer head to the biceps. These three sides are shown in the diagrams, the one facing inwards in Fig. 114, the one backwards in Fig. 112, C, and the one forwards and sideways in Fig. 112, D. As regards the triceps, let it be noted that though it has a side to itself, the backward one, it yet extends some distance across the inward one. Thus it has two surfaces, divided by the middle head.

55. The Brachialis Anticus, Coraco-Brachialis, and Biceps Cubiti Muscles.

THE brachialis anticus, somewhat in shape like a *vesica piscis*, a pointed oval, lies beneath the biceps, but appears in what in the last paragraph are described as the sides of the arm looking inward and forward-sideways. Its form is not very distinctive, the biceps and triceps, which it separates, having both more character. Nevertheless its volume is very important, as the lower part of the biceps is seldom wide enough to cover it. Reference to it will be found marked BA in Figs. 115 and 122.

In the living model the biceps does not show that it has two "heads." When inactive it appears as a short, fairly straight and stout cylinder with rounded ends, for the muscle diminishes rapidly to tendon at both ends. Across the centre of the cylinder is a very shallow depression which gives a slight wave to the outline (see Fig. 115, D).

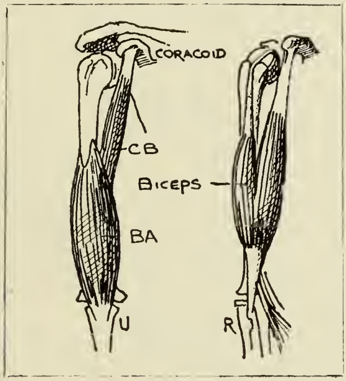

FIG. 113.

Brachialis anticus.

Attachments—Lower half of anterior surface of the humerus—below coronoid process of ulna.

Coraco-brachialis.

Attachments—Apex of coracoid process of scapula—inner side of the middle of the humerus, anterior surface.

Biceps cubiti.

Attachments—Long head, above glenoid cavity, short head, apex of coracoid process of scapula—by a long tendon to back of bicipital tuberosity of radius, the tendon sending off a fibrous expansion which spreads out over the fascia of the flexor muscles of the fore-arm.

It is well known how the biceps changes its form when acting as a flexor of the elbow. It runs up from its lower end and gathers into a mass in its upper part, more suggestive of a sphere than a cylinder. And whether the muscle is engaged in flexion, or, in company with other muscles, flexors and extensors, is strained to render the arm rigid, the fibrous expansion over the flexors of the fore-arm is evident. (Figs. 114, B, and 115, E.)

The coraco-brachialis, which is a proper adductor of the arm, occupies a position between the biceps and

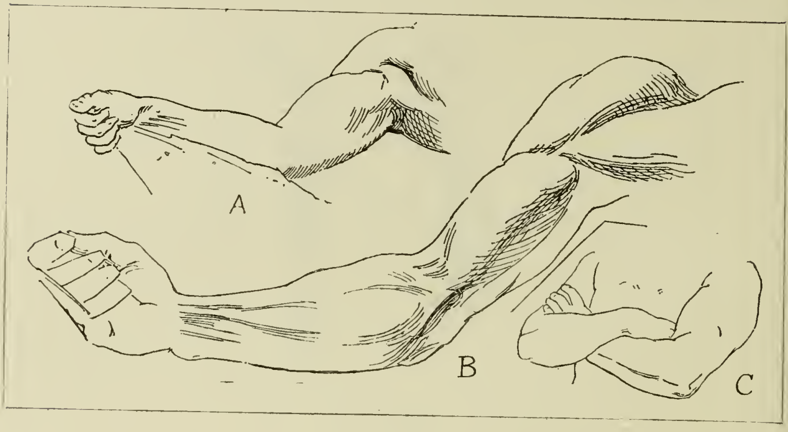

Fig. 114.

triceps, and proceeds up to the arm-pit; and appears somewhat similar in mass to the inner edge of the brachialis anticus, which, like it, is between the triceps and biceps, but on the lower half of the inner side. The coraco-brachialis may be seen in Figs. 114, A, and 115, D, E and F.

56. The Order of Arrangement of the Muscles about the Arm-pit.

THE way in which three muscles of the trunk approach and attach themselves to the arm requires special attention. These three are,—teres major, latissimus dorsi, and pectoralis major. The teres comes from the back of

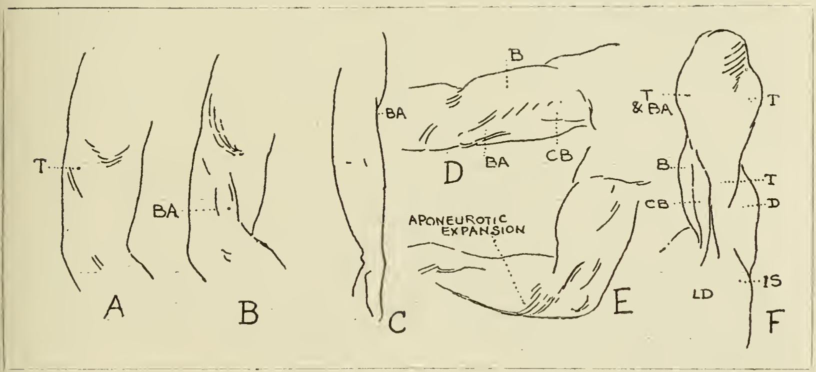

FIG. 115.

the scapula, the dorsal from the iliac crest, the pectoral from the chest, and they are all inserted into the humerus in a small area about the bicipital groove, a groove on the front of the bone in which the long head of the biceps plays, like a cord in a pulley. The order in which these three muscles are attached is easily remembered if their initials be taken and made into the word PELT; that is to say, that reading the attachments on the humerus from the front, there is to the outside, first the pectoral, next the latissimus or dorsal, and last the teres.

Let it be further remembered that the latissimus and teres are intimately associated at their insertion; and they thus form a party, as it were, from the back, as distinguished from the representative of the front of the body, the pectoral. Between these two masses pass the biceps and coraco-brachialis. In drawing the arm then, having placed the double outline for the deltoid, one follows, from the insertion, for a little distance, its ascending anterior border, and then takes up the axillary or arm-pit border of the pectoral, which carries one over to the trunk. Beneath this is the large bulk of the biceps, and close to it is the coraco-brachialis, for the short head of the biceps and that muscle have the same insertion. Next to the coraco will come a mass for the latissimus and teres, and last the triceps of the arm.

Looking at the matter of the order of arrangement of the muscles above the arm-pit in another way, and omitting the deltoid and the rotator muscles beneath it (supra-spinatus, infra-spinatus, and teres minor), it will be found that the first syllables read, commencing at the back, in this order—

TRI (triceps); TER (teres major); LAT (latissimus); COR (coraco-brachialis); BI (biceps); PEC (pectoral).

If punning be allowed, and the Scotch for crow (corbie) be imported, and little heed be paid to the sense of it, a sentence is formed—

Try to let corbie peck;

which may nevertheless be an aid to memory.

Both the latissimus and pectoral have short flat tendons twisted upon themselves. The effect of this twist, apart from its mechanical advantage, is to soften the connection with the arm, making an upward curve, as seen very prominently in the pectoral border of the arm-pit.

57. The Arrangement of the Muscles of the Fore-arm.

THE muscles of the fore-arm may be roughly divided into two groups, flexors and extensors, operating upon the wrist and hand. There are muscles with other duties, but they do not interfere with this general classification. Instead of the flexors occupying completely and only the front of the fore-arm, and the extensors the back, each

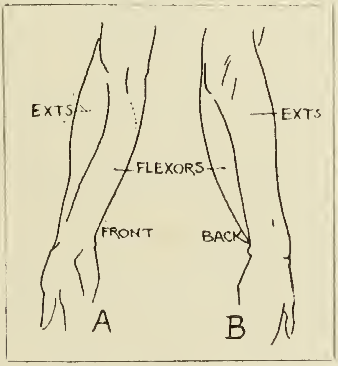

FIG. 116.

group encroaches upon the other's territory. Thus in the front view, part of the extensor group (the supinator longus though not an extensor is by location part of that group) is seen on the outer, or thumb side, the muscular division being a graceful line. And in the back view part of the flexor group is seen on the inner side, and is limited by a line (B), representing the ulna bone, not very unlike the other dividing line.

The details of the muscles are shown in Fig. 117.

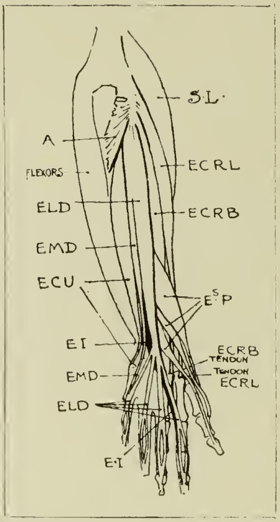

FIG. 117.—The Muscles of the Fore-arm. (For ELD in this diagram read ECD.)

EXTENSOR, OR BACK GROUP.

Supinator radii longus.

Attachments—Upper part of epi-condyloid ridge of humerus—base of styloid process of radius.

Extensor carpi radialis longior (longer extensor of wrist on radius side).

Attachments—Lower part of epi-condyloid ridge of humerus—base of metacarpal bone of first finger.

Extensor carpi radialis brevior (shorter extensor of wrist on radius side).

Attachments—External condyle of humerus—base of metacarpal bone of second finger.

Extensores pollicis (extensors of the thumb, three in number).

Attachments—Back of the ulna and radius—respectively to the bases of the three bones of the thumb.

Extensor communis digitorum (common extensor of fingers).

Attachments—External condyle of humerus—by four tendons to the back of the bases of last two bones of the fingers.

Extensor minimi digiti (extensor of the little finger).

Attachments—By the tendon common to the extensors of the fingers, to the external condyle—back of base of last two bones of little finger.

Extensor indicis (extensor of index finger).
Does not appear on the surface.
Extensor carpi ulnaris (extensor of wrist on ulna side).
Attachments—External condyle—back of base of fifth metacarpal bone.
Anconeus.
Attachments—Back of the external condyle—outer side of ulna below the olecranon process.

The flexors may be considered as making a mass, soft and fleshy above, without distinct muscular markings. It is indeed, perhaps, only a waste of time to trouble about them in detail. The shape of the mass known, and the one or two prominent tendons in the wrist noted, there is little to be gained by a study of the muscles separately. With the extensors, however, the case is very different. Virtually every muscle shows. (For the effect of the flexors see Fig. 114.)

The ulna forms an excellent basis upon which to arrange the muscular marking of the extensor group. A portion of it is subcutaneous, that is, close under the skin, and thus gives a permanent line from the elbow to the little knob which terminates the bone below, and which is plainly to be seen on the little-finger side of the wrist. The line which expresses this subcutaneous portion is also the edge of the flexor mass. It is a slightly curved line, and does not entirely follow the shape of the ulna, which is straighter. The next point to mark will be the external condyle, almost covered by muscle, and having immediately below it the head of the radius, which, although crossed by the tendons of the extensor muscles, yet sometimes shows as a slight knob-like projection. (See Fig. 132.) From the external condyle radiate five of the seven muscles which pass down the fore-arm from this region ; the other two, supinator longus and extensor carpi radialis longior, coming from the epi-condyloid ridge above. It is important to notice that these two are not arranged as longitudinally with the limb as the others, but are placed obliquely, and thus pass from the back to the front of the arm, and constitute that portion of the extensor group which is found on the flexor side. Hence, in representing these muscular forms by lines, a proper

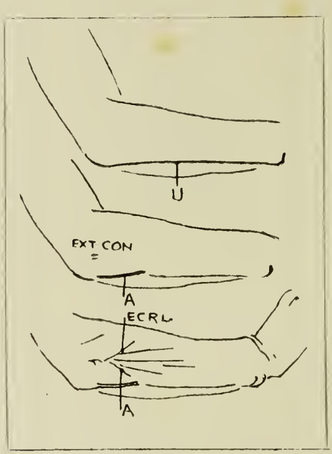

FIG. 118.

difference must be made between those for the two and those for the five. It may be noted that the line of the extensor carpi radialis longior, the lower of the two, is almost symmetrically placed with the lower border of anconeus; the two borders making an angle into which the four straightest extensors fit. One of the three borders of anconeus comes upon the line indicating the ulna, which it supersedes for its short extent, Fig. 118, and renders angular.

58. General Characteristics of the Arm.

THE arm, roughly speaking, consists of two cylindrical masses, one, represented by the biceps forming the front; the other, represented by the triceps forming the back of the arm; the fore-arm also consists of two masses tapering toward the wrist. These two masses of the fore-arm represented, the outer one by the supinators, the inner one by the flexors, are placed in a position contrary

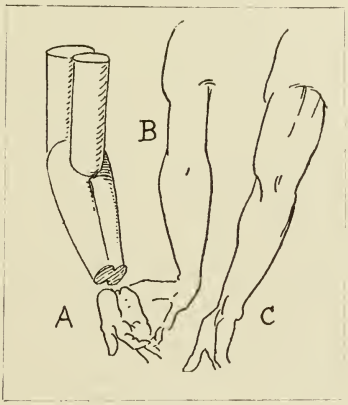

FIG. 119.

to that of those of the arm, having their flat side forward, while the arm has its flat side outward.

It happens then that when the fore-arm is seen at its widest, the arm is reduced almost solely to the width of the biceps; and similarly, when the arm is seen at its widest, the fore-arm is at its narrowest. (See also F and H, Fig. 106.)

The directions are not, however, exactly contrary, though very nearly so. When the greatest width of the fore-arm is directed forward, a little of the inner side of the upper arm is seen, as in Fig. 106; or in other words, there is a slight suggestion of continuity between the biceps mass above, and the supinator, or outer mass, below.

In drawing any part of the figure, the first things to fix upon and locate will be such indications of bone as exist on the surface. By these also proportion is best secured. In the arm, the part above the elbow that is,

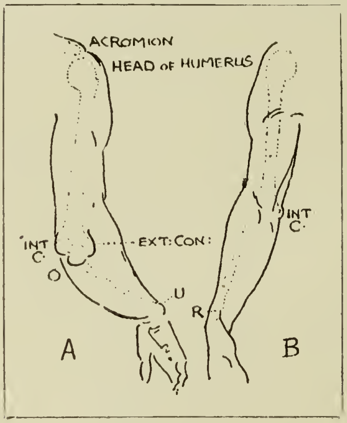

FIG. 120.

there is very little bone exhibited. Above, the head of the humerus has to be thought of as just under the acromion, and contributing considerably to the upper bulb of the deltoid mass. Below, in all probability the olecranon, or one of the condyles, or all three, will be seen. If the fore-arm be bent, the condyles and olecranon will very likely show as a triple form not unlike an inverted trefoil. In most cases the internal condyle will be the landmark, limiting the internal line of the arm.

Just as this internal line happens to be long, extending from the arm-pit to the internal condyle, so the external line is short. For the deltoid reaches nearly half-way down the humerus, while the supinators of the fore-arm reach a third up it, so that between the deltoid and the supinators there is very little space at all.

In the fore-arm the ulna and radius both become evident, the ulna more completely than the radius. It is subcutaneous throughout its length. The student will probably already have noticed that the ulna takes one side of the wrist, the radius the other, and that the ulna belongs to the little finger, the radius to the thumb. The diagrammatic position of the arm has the *little finger* against the body, the palm being forward ; the position with the palm downward and the *thumb* against the thigh is however more natural. The two positions have already been described as respectively supination and pronation. Before proceeding with his drawing of the arm, the draughtsman has to determine whether it is to be pronated or supinated. This settled he can proceed, and he proceeds as follows. Supposing the arm to be in a simple natural position, pronated, the drawing will be commenced as in Fig. 106, A, and continued as in Fig. 121, A. The form of the elbow (O) will be placed, and then the other end of the ulna (U) at the wrist. Then the subcutaneous ulna itself will be indicated by the line of *anconeus* (A), and the long line U. Beneath the line thus put together will be two curves (F) representing the *flexors*, and forming one of the outlines. Note that the upper of these lines does not commence at the projection of the olecranon (O), but a little below it, and also that the lower does not quite reach to the wrist. In the arms of women this lower line (F) must be fairly full, and must creep as low down to the wrist as possible. The upper outline of the fore-arm is definitely divided into two parts, *at about the middle.* The upper part represents the supinator mass spanning the elbow-joint, and commencing about one-third up the arm. This mass is very important, and must be taken well up the arm. The lower part of the outline of the fore-arm consists chiefly of the lower end of the radius bone, but it is swollen by the extensors of the thumb (E Th.) which pass over it. The wrist must on this side have a curved outline (W), followed by a very slightly

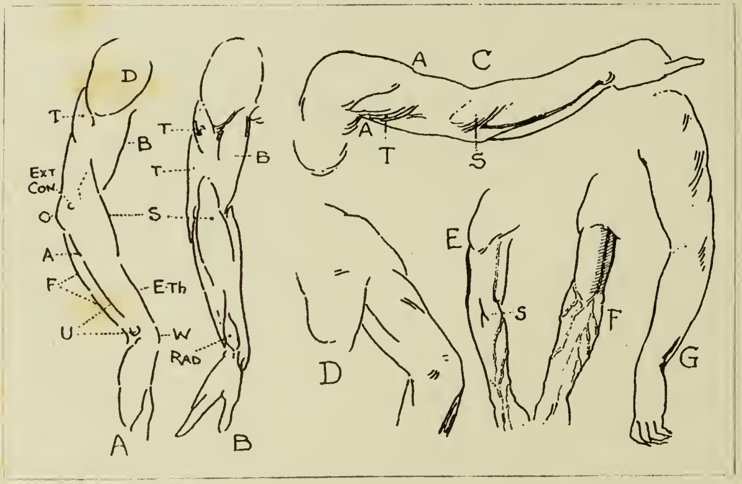

FIG. 121.

convex line for the back of the hand, and that by a double line for the finger. Above, the deltoid (D) must first be indicated, and on one side the biceps (B) by a waved line, and on the other the triceps (T). The outer head of the triceps must show as a prominent and distinctly oblique mass; and the lower part of the muscle leading down to the elbow must be convex, and the elbow must only project beyond it very slightly—not at all if the arm is bent.

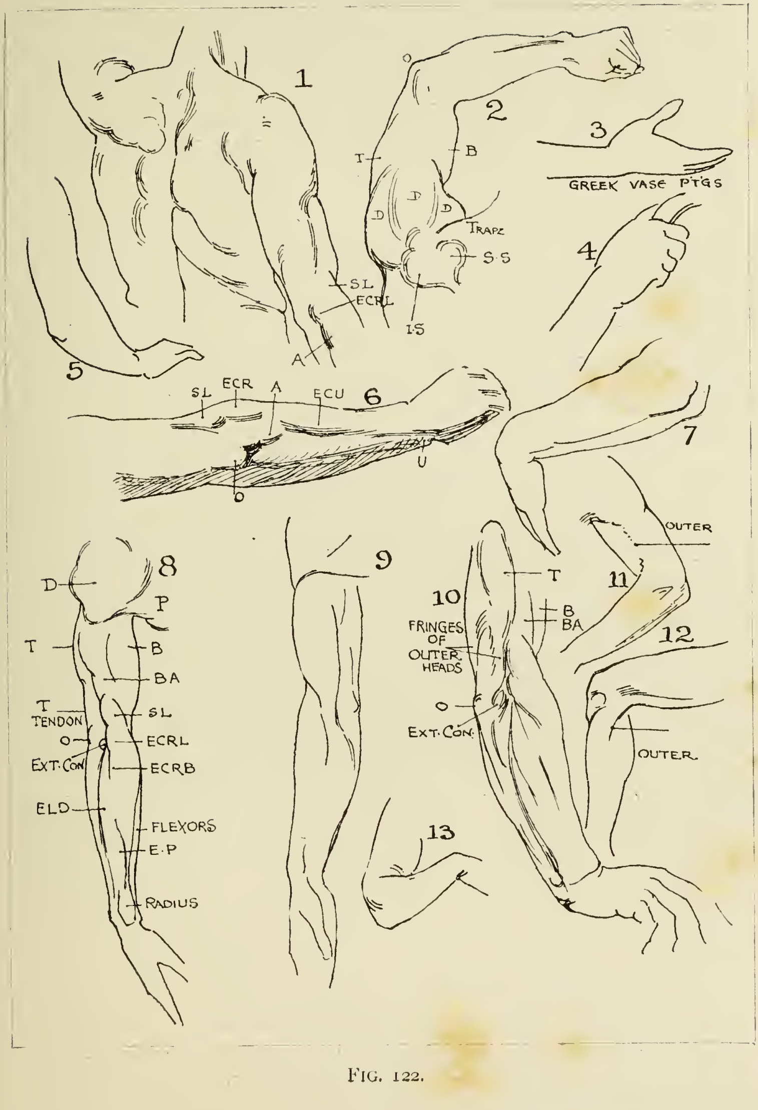

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FIG. 122.

No. 10, Fig. 122, is a similar view of the arm, detailed further, and with the hand extended instead of flexed. In this it may be seen also how that the triceps continues down into the ulna of the fore-arm so that the whole left side in the diagram is connected. The wrinkle across the back of the wrist is valuable, as it helps to indicate at once the fact of the hand being extended.

An outer view of the arm, not pronated, will be as given in Figs. 121, B, and 122 (8), the latter being the more forcibly extended. Excepting at the elbow, and then only slightly, the ulna will not show; but the lower end of the radius will appear in its place at the wrist, the upper part of it being lost beneath the extensors of the supinator mass. The lower end of the radius becomes the only bone visible, and appears longer and broader than the lower end of the ulna, being moreover tolerably sharp. Its form may be gathered from the diagrams. The outlines of the fore-arm are provided by the assemblage of muscles both at the front and back. The back outline is mainly due however to the ulna, the simple and hard shape of which it almost exactly repeats. The front outline has the fleshy bulging of the flexors, followed by a slight hollowing, succeeded again by the full roundness of the wrist. (Fig. 121, B.) The supinator mass is perhaps the chief detail of this view. The outline of the inner view of the arm (Fig. 122 (9)) will be the same as an outer view (Fig. 121, A), excepting only that the internal lines will differ. The biceps virtually provides all the form, as has been described, page 169; it has two tendons at its lower end, or rather a tendon and an expansion. The tendon dives down between the two masses into which the fore-arm is roughly divisible, while the expansion spreads over the mass of the flexors. The lower end of the radius will be the only other clearly-marked detail of the fore-arm. In the upper arm *coraco-brachialis* will appear between the biceps and triceps under the arm-pit, while *brachialis anticus* will show as a slight mound between the same muscles, but just above the condyle. (See also Fig. 115.)

The most remarkable details of the arm are certainly the masses of the *triceps* and *supinator* (T and S, Fig. 121, C). They are distinctly obliquely placed, while the *extensors* (E) of the fore-arm meet the supinator at a considerable angle, and are tucked well in at the external condyle. The deltoid must always have a waved outline, as being double in character and not ball-like. In the female arm (G) the doubling of the deltoid is very noticeable, the lower part or mass of it being very full, and low down. The arm at the arm-pit must be kept narrow in the back view (A A, Fig. 121, C).

The female arm (G) is wide in the upper part, and its section throughout rounder than a man's. In the back of the wrist in both it is necessary to express the ulna line and knob, as in G, as supporting the hand. The back view of the arm (Fig. 121, D) has the biceps continued on the fore-arm by the aponeurotic expansion, and a line parallel to the biceps separating it from the triceps.

The veins of the arm must not be overlooked. Their exact number and position is not important, and they are divisible, roughly, into two groups, an outer and an inner. Both groups commence in the upper arm as single veins running longitudinally down the limb. We have spoken above, page 168, of the arm being in section triangular, with one surface flat against the trunk, and the other surfaces directed one backward and outward, the other side-ways and forward. The angle between the inner surface against the trunk, and the side, is formed by the front of the biceps muscle—a wide angle certainly. So that while the *front* of the biceps forms the angle, its sides become parts of the outer and inner sides of the arm. Now it is just at the junction of the outer side and front of the biceps that the outer vein occurs; and its effect is to accent the surfaces spoken of. The inner vein is about midway across the inner surface of the arm; in fact between the biceps and triceps muscles. Having thus a natural hollow to lie in, it is not so evident as the outer vein which lies on the body of the muscle.

The inner vein becomes very prominent at the hollow of the elbow-joint, where for an inch or less it shows as massive in volume and blue in colour. In the hollow of the joint two branches are sent off from both the inner and outer systems, and make any distinct division impossible. Nevertheless, as an aid to memory, the following may be taken as the arrangement. The inner system follows the direction of the *aponeurotic expansion* of the biceps, falling round the mass of the flexors, as shown in Fig. 121, F. The outer group skirts the supinator mass (Fig. 121, E), as if to avoid climbing the ridge, and passing over the extensors of the thumb reaches the back of the wrist, where it descends to the back of the hand, keeping to the middle course. The arrangement is, however, very variable.

The complexity of these veins renders them difficult to introduce. Their effect is to break the flowing curves of the fore-arm, and to render polygonal its smooth surfaces.

The wrinkles, or creases, are always of great assistance. They help one to seize the conditions and facts of the pose. Those of the arm may be capitulated as follows—

When the arm is fully extended, there are a few creases at the back of the elbow; when it is flexed there are one or two before the elbow-joint. As the mass of the supinators crosses the joint, it becomes folded in flexion of the elbow, with a deep crease between two very voluminous masses, which so increase the bulk in that region as to seem to threaten the gracefulness of the fore-arm. And at the same time the bones project very prominently below. Both these peculiarities must be frankly accepted. (Fig. 122 (13).)

At the wrist-joint several creases appear in the action of flexion; in extension, the puckering of the skin hardly amounts to creasing. But in forced extension, a distinct crease appears at the end of the arm-bones. It at once indicates the force and character of the movement, and the flatness of the back of the wrist.

59. Movements of the Wrist and Hand.

The wrist, like the flexor muscles of the fore-arm, is so full of detail that it becomes simplified by its very complexity.

The wrist proper consists of eight small bones arranged in two rows, four in each. Between the two rows is a kind of ball-and-socket joint, the length of which is the width of the wrist, and the breadth in thickness; or, since the bones are much of a size, it is four bones long and one wide. A similar joint is between the upper row and the end of the radius. By these joints a degree of all movements is possible, except rotation, which is precluded by the length of the articulation in proportion to its width. The different bones of the carpus (wrist) also glide upon one another, so that the whole region is one of complete though limited mobility.

For the designer it is sufficient perhaps to specify only the following details of movement—

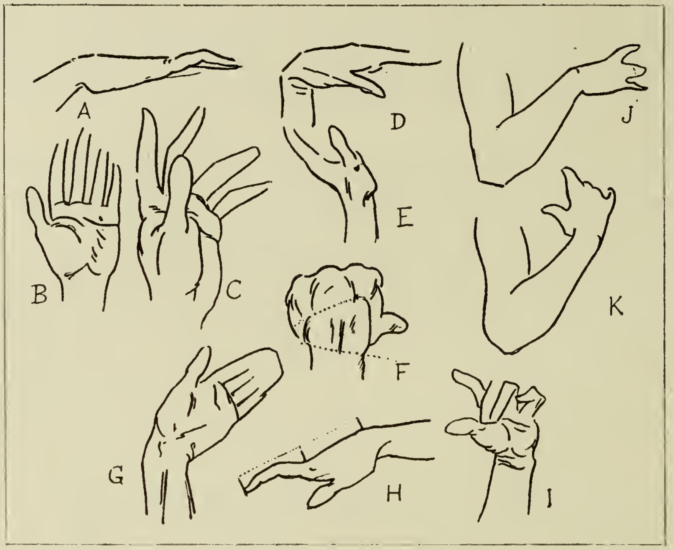

FIG. 123.

The wrist may be bent sideways (adducted, Fig. 123, G) in the same plane as the fore-arm, to a considerable angle, as illustrated, but it can scarcely be abducted (the thumb sent towards the arm) at all, if kept in the same plane as the arm. And in this matter of adduction and abduction of the wrist, the law of the association of flexion with *ad*duction and extension with *ab*duction holds good.

Extension with slight adduction is possible, and not inelegant. It is seen in the gesticulation which sometimes accompanies a declaration, and in some attitudes of pointing.

Abduction with flexion is virtually impossible, adduction being nearly always present.

In the attitude of the hand upon the breast, adduction, J, is certainly better than abduction, K, which looks strained. In these attitudes the hand is flexed upon the fore-arm.

The movements of flexion and extension of the wrist are illustrated in Fig. 123, D and E, where it will be seen

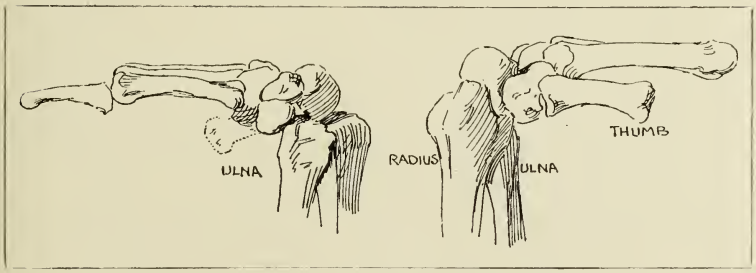

FIG. 124.—The Bones of the Wrist and of the Body of the Hand.

that flexion goes as far as a right angle, extension only about 45 degrees.

It will not be expected that the fingers will follow the curve or direction of the wrist; they are often found contrasted with it, in accordance with that principle of variety and alternation upon which grace depends. (Fig. 123, A and H.) Thus, while the wrist is flexed, the fingers or the first or longest bones of one or more may be raised, though the two shorter joints of the fingers may also be flexed. In this position the wrist appears strong and well-rounded, and the curve it commences flattens a little, but does not change till it arrives at the knuckles. If the person be bony, the wrist will show as slightly flattened at its hinder part, and the end of the radius will display a slight knobbiness.

60. Details of the Form of the Wrist.

THE wrist has a front, a back, and two sides. Each side is flattened; the thumb side by the somewhat trapezeform "side" of the thick end of the radius, the other by the ulna bone and the tendon of the flexor carpi ulnaris, a tendon which naturally shows most when the ulna side of the wrist is flexed. Between the tendon and the ulna is a shallow concave hollow, which runs back and gradually gets lost in the line on the ulna which bounds the mass of the flexors. The ulna plainly reveals its drum-stick end. This ulna side faces slightly downward, and is illustrated in Fig. 127.

The radius side is not so distinctly flat, the trapezeform side of the radius being itself somewhat rounded, and unsupported by such a tendon as that on the other side. The tendons of two of the extensors of the thumb more or less outline it, but they are only evident between it and the ball of the thumb (see Fig. 131, C), and do not therefore affect the wrist itself.

Another point of contrast between the two sides, and which has already been suggested, is the smallness, roundness, and prominence of the ulna end in comparison with the longer, flatter, and less generally prominent radial end. Alternation is also observable in the bones of this region. (Fig. 123, F.) The end of the radius commences higher up, and finishes lower down than the end of the ulna. Between these ends the back of the arm is flat, except when the wrist is bent, when it becomes somewhat rounded.

The wrist-bones form an arch, the hollow of which is at the front, and encloses, and is filled up by, the tendons of the flexors of the wrist and hand. The rounded back of the arch forms a noticeable roundness at the back of the hand just below the wrist-joint.

The front of the wrist presents a somewhat symmetrical arrangement of tendons. One, the tendon of *palmaris longus*, is exactly in the middle, and runs up between the two convex curves which form the lower border of the

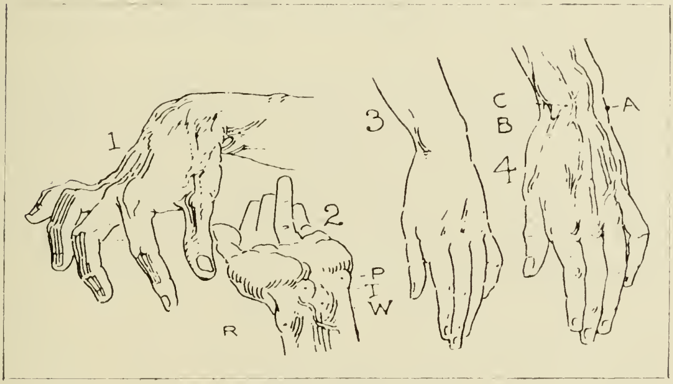

FIG. 125.

palm (Fig. 131, B). To the thumb side of this central tendon is another (*flexor carpi radialis*, the mass of which is shown in Fig. 114, B), passing apparently to the bony knob (the *trapezium*, one of the small bones of the wrist), marked T in Fig. 125. Then at either side is a tendon, as shown in Fig. 131, B. Of all these, the tendon of palmaris longus is the first to show itself when action commences; it is particularly noticeable if the hand be kept flat, and the wrist slightly bent.

The bony forms of the wrist are chiefly provided by the ends of the arm-bones, and the character of these is of the utmost importance to the draughtsman. The wrist-bones themselves provide, as has been said, the arched back of the wrist, but without producing any striking features. However, they are not wholly hidden. Thus A, Fig. 125, is the side of the wrist-bones, and forms a little connection between the arm and the hand. On the other side (B), the wrist-bones lie rather lower, and are moreover crossed by one of the extensor pollicis tendons. Just above (at C) the larger bones of the first row (see Figs. 107 and 124) extend the mass of the radius with which they articulate.

When the wrist is bent back, as in Fig. 125 (2), some of the bony forms of the wrist show with considerable distinctness. In the diagram, R marks the end of the radius, W the mass of the wrist, T the bead-like projection of the trapezium, and P the similar but less isolated mass of the pisiform bone.

61. The Hand.

WE have pointed out that the hand must be considered as a joint or section of the arm, and not left to be added later as a trivial appendage. In the first sketch then, its whole length must be suggested ; but not necessarily as in Fig. 106, A, which is very stiff, but rather as in Fig. 121, A. For it is very rarely that the fingers are stiffly continuous with the body of the hand. We may indeed regard the hand as composed of a somewhat flat and unchanging "body," and a flexible mass composed of the fingers. Both these parts are of about the same length.

The body of the hand is four-sided, and narrower at the wrist than at the knuckles. So that after one has traced the lines of the fore-arm and has settled upon the ends of the ulna and radius, and then narrowed in a little beneath them to suggest the wrist-bones, one carries two divergent

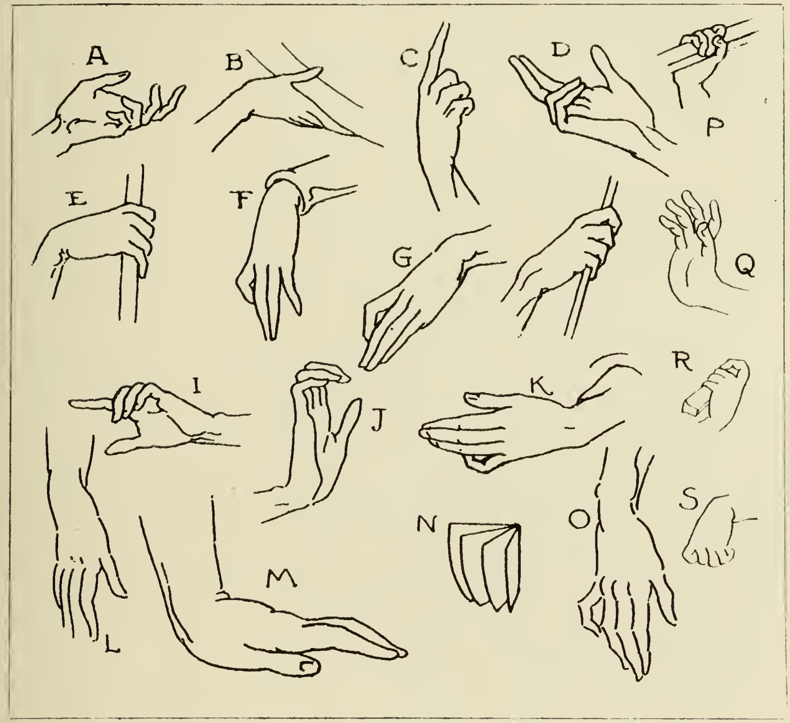

FIG. 126.

lines downward for the body of the hand, after which will follow the fingers. The body of the hand presents four subjects for study,—the palm, the back, the thumb-ball, and the little-finger ball.

The chief characteristics of the back are the convergent tendons of *extensor communis digitorum*, which are suggested on the backs of gloves, and which themselves suggest the metacarpal bones beneath them, though the bones do not converge so rapidly. Between and crossing these tendons are several veins. (Fig. 125.)

The palmar surface divides itself into three parts—a base for the four fingers, the ball of the thumb, and the ball of the little-finger side. See Figs. 123, 127, and 131.

The ball of the thumb is defined by a crease, or line, to which the thumb-seam of a glove corresponds. When the thumb is drawn over the palm, the ball becomes a thick mass, and a fold between the thumb and the palm. Thus crushed up, the ball presents an outline undulated, but approaching the straight.

The base upon which the fingers stand is partitioned off from the rest of the palm by two lines, one over the thumb-ball, the other under the three outer fingers.

This base, in accordance with the general arched character of the hand and wrist, is lower in the middle, so that, except when the palm is stretched wide open, the parts below the first and fourth fingers separate from the base, and form shapes somewhat square. These are not of course represented by rigid lines.

Nor is the ball of the little-finger side, but by a number of broken creases radiating from the narrow space between the thumb-ball and the finger-base. The two balls meet at the wrist by strongly-curved lines, which form a point running up into the palm. Beneath, and on the thumb side of this vertex, is a well-rounded, small, bony prominence, from which one of the prominent tendons of the wrist passes to the arm; beside it another tendon comes from the region of the vertex itself. On either side of these tendons is a hollow bounded in both cases by a short display of tendons.

The side view of the little-finger-ball is especially graceful, its straight lines contrasting well with the curved portions of the hand. In the annexed diagram the ball occupies the space between the dotted lines. It is double in form, the upper part being the end of the base of the fingers as seen in the palm. The angularity of the outline of the ball must not escape attention (Fig. 126,

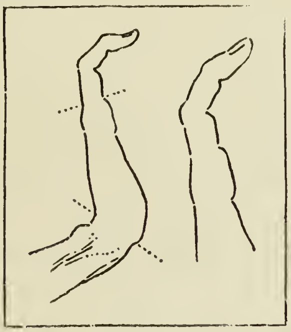

FIG. 127.—The Ball of the Little-Finger.

D and J), but sometimes it is crushed into a rounded form as in C.

The hands in Fig. 126 are chiefly Gothic, and illustrate the conventional positions which constituted the stock-in-trade of the old artists—as regards hands. P Q R and S are Japanese. L and M are plump female hands. In L may be noticed the roundness of the wrist at the back, in M the roundness in front of it. In M also the back of the hand is puckered into two masses, as if the fingers had a fleshy "base" on the back of the hand as well as on the palm. N is an arrangement of lines to illustrate the different directions at which the fingers are placed. It shows that the fingers must not be drawn parallel, but becoming regularly more curved in accordance with the foreshortening shown. The application of this is shown in O, which is intended also to epitomize, in an exaggerated manner, the forms of the wrist and hand, and to illustrate the concave character of the several "joints" of the fingers.

62. The Form of the Fingers.

EACH of the fingers has three bones, phalanges, with also a metacarpal bone, which becomes part of the body of the hand. These four bones are all much alike, and appear as in regular succession. The shaft of the metacarpal is virtually round in section, while the shafts of the phalanges are flattened underneath but retain their roundness above. (Fig. 128.) The metacarpal is straight, the phalanges bent downwards. The fingers are rarely, if ever, quite straight, being generally slightly flexed. The third phalanx turns up to support the nail, as though nature could not permit a curve to remain without alternation. This bending of the third phalanx is peculiarly graceful. Compare Fig. 126, M.

The ends of the phalanges are wider than the shafts, emphasizing the tendency toward flatness suggested by the under side of the bones. They are also deeper than the shafts, and produce a double bony prominence. It is the top of the lower end that makes this prominence. The lower end of the metacarpal also dominates the form in its region. It is large, and approaches a ball-shape, and consequently shows on the knuckles as a single but rounder eminence. (Fig. 107.)

In drawing a finger, one may first suggest the three "joints," as they are commonly called, as at B, Fig. 129, letting the last one turn up a little. Then at the top, one may add the large single mass for the end of the metacarpal, then at the two other joints, the double form of the ends of the phalanges, and finally the nail directed outward a very little. A further slight detail has to be noted. The two prominences on the finger-joint both belong, as has been said, to the upper side of the lower end of the one bone. This upper side is narrower than the

FIG. 128.—Phalanges of a Finger and Thumb.

lower, and therefore these two prominences do not cover the whole width of the finger. Again, the lower side of the upper end of the other bone, the second phalanx, is possibly a trifle wider than the lower side of the first phalanx. So that below and slightly to the front of the two eminences is a suggestion of bone expressing the full width. This is indicated in Fig. 129, A.

The fingers bear no muscles, giving attachment only to the tendon of the muscles which move them, and which are placed in the hand and arm. The clothing of the fingers is due then to the skin, and the fat and fascia beneath it.

The fatness increases the bulk of the shafts of the phalanges, not of the joints, and gives very much the effect of a layer of muscle between the joints. Particularly in the fingers of women is this to be observed. Omitting this fattening, the finger appears widest at the joint between the first and second phalanges, and as if diminishing as it approaches the hand. This is because the upper end of the first phalanx is hidden against the large knuckles of the metacarpal, which seems to belong to the hand rather than to the fingers.

The details of form supplied by the skin, with its thickening of fat and fascia, are as follows. Upon all the phalanges, at the back that is, there is a fleshy confirmation of the longitudinal curve, and transverse roundness of the bones. Over the joints the skin is thinner, and wrinkled with a number of small creases forming roughly an oval, transversely placed. These are, of course, chiefly seen when the fingers are straightened, and are more marked at the first joint than at the second.

Taking the finger straightened, and in side view, the outline becomes a succession of slow gentle curves over the shafts and rapid puckers over the creases at the first joint, and a suggestion of the same over the second (E).

On the under side the outline is roundest under the outer end of the first phalanx, has a suggestion of double curvature under the second, and is palpably double under the last. It is perhaps safe to be guided by the old French motto, "more than less," and let the form fluctuate more rather than less. The flowing double or treble line of the "bad period," with its flatnesses, does not ill suit the under side of the fingers. (See paragraph 10.)

It must be noted that the creases which appear on the under side of the finger do not exactly correspond to the joints which produce them. They both occur under the second phalanx, thus lengthening the under side of the last, and tending to lengthen that of the

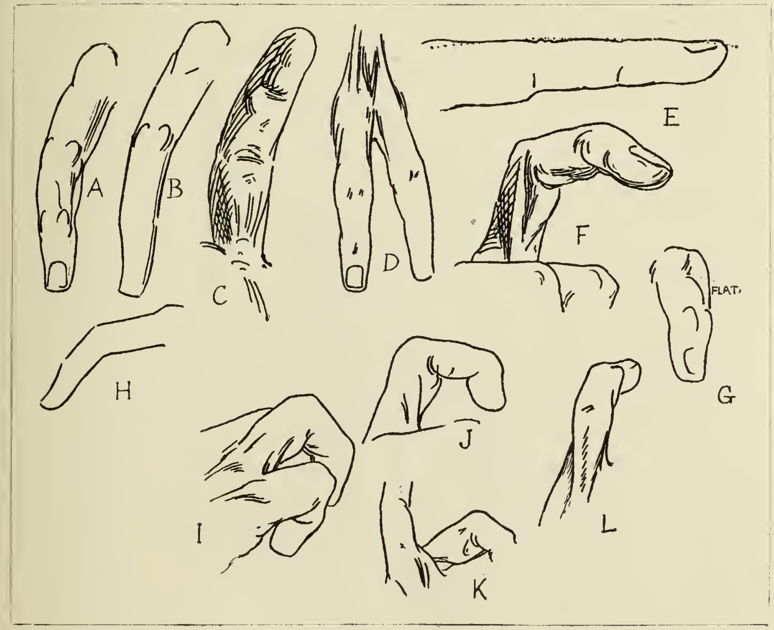

FIG. 129.

first. The length of the first is considerably reduced by the webbing of the hand reaching some distance up on the palmar side, and by the presence of another crease similar to those on the length of the fingers close against the palm. Thus, as any one may see by examining his own hand, the division of the fingers on the palmar side appear virtually equal, the last divisions of the third and fourth fingers being among the largest.

The under side is like the bones, flattened, though the outer end of the third and second phalanges is rounded considerably. The fingers may with advantage be considered square in section, so that even the tops

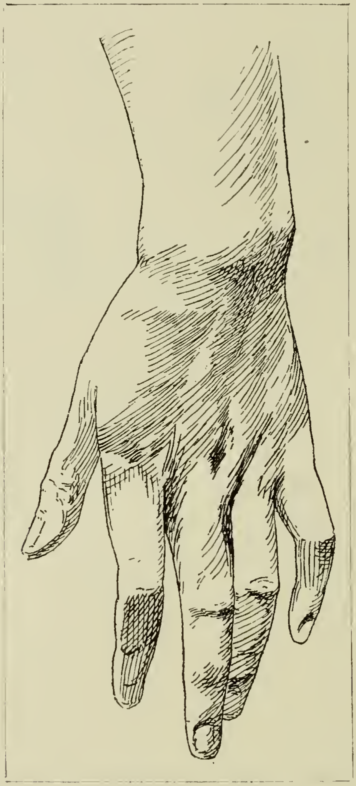

FIG. 130.—Female Hand.

are flattened. (See Fig. 125 (1).) With apex at the root of the finger, a triangular mass stretches up to the outside of the first joint, being hollowed and crinkled somewhat down its centre. (Fig. 129, C.) From the joint a similar broad triangular piece seems to start, but dies into a rounded mass before the second joint. Then again at the second joint a flatness commences, but sooner gives way to the round forms, of which there are two.

In the bent finger, extended on the hand (F), the triangular piece just spoken of appears strongly marked, and if the fingers on either side be flexed, it will be accentuated by a fold on either side. In all such positions these two forms will be seen, the triangular piece perhaps in profile, as at J, the crease by a softer diagonal line.

Some of the variations to which these creases are subject are illustrated in Fig. 129, and as every one's hands are available for experiment there is no need to enter into a description of the changes.

The tendons of the extensor communis digitorum show down the back of the hand, spreading out from a position on the wrist a little to the ulna side. They pass over the knuckles, and get lost on the first phalanx. They continue, however, to the third, splitting as they approach the first joint, and thus contribute a degree of the flatness observable below the first joint. These tendons appear to hold the finger on, very much in the same way as the finger-stall of domestic surgery (D). The form of the finger-stall is also maintained in the way in which the finger continues up the back of the hand, the channels between the knuckles being very noticeable and much beloved by draughtsmen of "terror and wonder."

The tendon of the special extensor of the little-finger may readily be observed, close to the tendon for this finger from the extensor communis digitorum (L). The special one for the index-finger is hardly perceptible.

The fingers are of different lengths, and set upon a curved border of the palm, which in some persons is less curved than in others, so that some persons' hands are square, and others ovoid.

63. The Thumb.

THE thumb consists of only two phalanges, which are similar to those of the fingers (Fig. 128). Calling the two parts of the thumb "joints," we notice that the end joint is convex in outline, the first joint concave, so that D, Fig. 131 will epitomize the shape, if the basal joint be included as part of the thumb, as perhaps is best. The end joint on its palmar surface appears heart-shaped (F), while the first joint has the same triangular arrangement that was noticed in the first joint of the fingers. On the outer side (E), the first joint appears square in section, the squareness being due to one of the extensor tendons which attaches to the base of the second phalanx, and shows very distinctly sometimes, as in Fig. 125 (I).

Viewed from above, the second phalanx has a somewhat ovoid form, succeeded in the first phalanx by contrasting concave lines. In side view the chief difference to note is that under the end phalanx the tip is not so bulky as the roll or mass behind it, which is both deeper and broader than in the fingers. The nail is directed upward a little more than in the fingers.

Two of the three tendons of the three extensors of the thumb generally show between the ball of the thumb and the end of the radius. The one towards the middle of the hand, the extensor secundus internodii pollicis, goes to the base of the second phalanx. It is, therefore, very plainly seen down as far as the thumb-joint, during strong extension. In that action too the inner side of the basal joint of the thumb shows as part of a tolerable sphere.

The tendon just spoken of gives a degree of angularity to the first phalanx, which is increased to squareness by the edges of that fold of skin which answers in the thumb to the triangular surface spoken of, on page 199, as noticeable in the finger; so that the first phalanx may sometimes be drawn as in Fig. 131, E.

The student will hardly need telling that the thumb

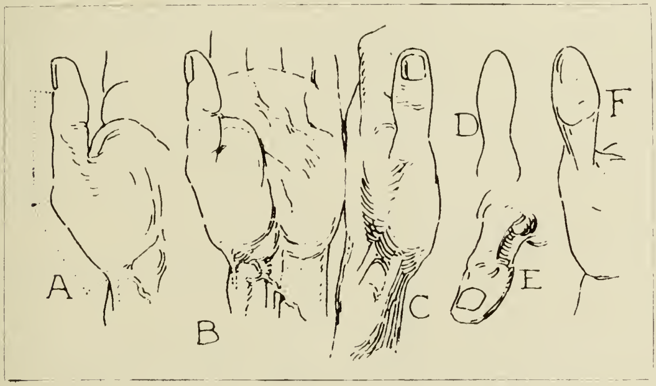

FIG. 131.

is not placed in the same plane as the fingers. Its nail is directed almost exactly sideways; and the thumb and its ball are situated as much at the front as at the side of the hand; in the female they are much more distinctly in front.

64. The Proportions of the Upper Limb.

THE lower end of the humerus falls to about the level of the umbilicus in both sexes (Fig. 19), while the lower end of the radius reaches nearly to the level of the absolute end of the trunk, as is also shown in the diagram referred to. The end of the fingers falls to about half-way between the *trochanter* and the head of the *fibula.* The wrist is considerably below the trochanter in man, but only just below it in woman; so that in relation to the trunk and hip the female arm seems short compared with the male. And undoubtedly in relation to the trunk and hip the female arm *is* short, for the body in that sex is longer in proportion to the total height than in the male. Taking the measurement from the top of the shoulder to the lower border of the trochanter, it is one-third of the whole height in woman, but less than a third in man, being 21 inches in man and nearly 21 in woman. And the fact that the gluteal mass is lower in the female (compare 3 and 4, Fig. 19), also renders the body and hip, in that sex, longer; so that as far as contrast goes the female arm appears short.

If the hands are folded before the figure they will just cover the centre of the body.

The proportions of the different parts of the arm to one another are not easy to seize. The bone-lengths are about 13 inches for the humerus, 9 for the radius, and $7\frac{1}{2}$ for the wrist and hand. In the female about $11\frac{2}{3}$, $8\frac{1}{2}$, and 7 inches. If an inch be added for the acromion, it gives the upper part a measurement of 14 and 13 respectively. But these measurements are very variable.

The lengths of the female radius and wrist and hand bear the same proportion to the whole figure as in the male, but the female humerus is nearly half an inch shorter than the male, apart from the diminution due to lesser stature. We have given the length of the radius as that of the fore-arm because the ulna overlaps the humerus somewhat. Its length is $10\frac{1}{2}$ inches.

The head of the humerus being lost under the deltoid, the acromion process of the shoulder becomes the uppermost point of the arm. The lower end of the humerus is indicated on the outer side by the external condyle, or more exactly by the space between it and the head of the radius (Fig. 132), and on the inner by the inner condyle, though its prominence is some little distance above the end of the bone (see Fig. 107). In the diagram above there will be seen a dotted line across the elbow. This dotted line runs from the olecranon behind, to the

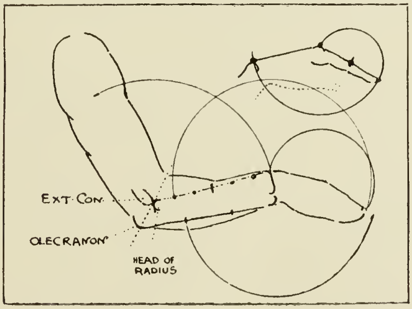

FIG. 132.—The Proportions of the Arm and Hand.

inner side of the joint, distinctly marked by a large blue vein; and, moreover, is not at right angles to the direction of the humerus, but is higher in front even in the straight arm. On either side of this dotted line, on the outside, occurs the external condyle above, and the head of the radius below. From the measurements we may deduce the facts that the radius is in length about two-thirds of the upper arm (including the acromion); that the ulna is to the upper arm as 3 to 4; that the hand and wrist are to the radius as 5 to 6, or as 5 to 7 to the ulna.

As a practical rule, one may sometimes take the distance from the arm-pit to the elbow-joint as equal to the fore-arm, then halving the fore-arm may find an approximate limit for the supinator mass, and then the back of the hand as nearly equal to one of these halves, and the fingers as equal to it.

The hand and wrist, $7\frac{1}{2}$ inches, are well known as being equal to the face. The whole index-finger is about half the hand and wrist together, and the two small joints of that finger are together equal to the longest. The two small joints are also equal in length to the nose, 2 inches. The proportions must be taken with the fingers bent, as the knuckles are counted with the parts on either side of them. For the hand and wrist are not 8 inches long. In the female the fingers are comparatively longer, the hand narrower, and the wrist-bones smaller.

When the arm is hanging by the side the finger-tip reaches half-way down the thigh in man, not so far in woman. This difference is due to the greater length of the female trunk, and also to the fact that the first bone of both the upper and lower limbs is shorter in women and children than in men. In both male and female the middle of the fingers is half-way from the top of the acromion to the ground, a distance of about 50 inches in woman and 54 inches in man; while the elbow-joint is at about a quarter of the distance down. In the figure standing at ease, not erect, the large knuckle or the tip of the finger takes the central position, according as the shoulder is down or up.

THE LOWER LIMB

65. The Bones of the Hip and Lower Limb.

THE reader may be reminded that the pelvis is the bony basin supporting the trunk, and also providing the sockets in which the thigh-bones, femurs, articulate. It is made up of three bones, two innominate or unnamed, and the sacrum, which is the immovable part of the vertebral column. The innominate bone itself is made up of three bones, which grow together, and form one as the infant grows. These three are the Ilium, Ischium, and Pubes, and the regions which represent them in the amalgamated bone are the iliac, ischiatic, and pubic portions.

The pelvis is illustrated in Fig. 77. The iliac portion is that above the acetabulum, the ischiatic that which proceeds downward from it, and the pubic that which projects forward, or to the right in diagram C. In D the back of the two pubes is seen shaded.

The ilium is in section a double curve, a "line of beauty and grace." The convex outward portion spreads upward from the acetabulum, the part behind being concave. The upper border of the ilium, the iliac crest, has before been spoken of, page 116; it is of great importance as regards form. At each end of the crest is a spinous process, that before being called anterior, and that behind posterior. Beneath these are two other spines, so that there are inferior and superior spines, both before and behind.

The lower part of the pelvis, below the acetabulum, consists of the lower halves of the innominate, and comprises the two pubes and the two ischia. These two halves, placed at an angle to one another, meet at the symphysis between the two pubes, while the ischia at their lowest points are some distance apart. These lowest points of the ischia are the bones upon which one sits.

Beside the iliac crests and the back of the sacrum, the only part of the pelvis evident on the surface, and then only in a very indirect way, is a part of the pubes on either side of the symphysis. To this Poupart's ligament from the superior anterior spines of the iliac, attaches, and forms the groin, giving the strong round curve which limits the abdomen below.

In the male the groin keeps well down to the pubes, but in the female it is considerably above, so that the last fold of the trunk in that sex is deep.

The femur, or thigh-bone, answers to the humerus of the arm. Its articular surface is a much more complete ball, and the acetabulum into which it fits is a much more complete socket. Thus embedded, its range of action is more limited than is that of the humerus, though in some degree to counteract this deficiency it has a longer *neck*, without which it would be virtually impossible for the thighs to be crossed.

At the part where the neck joins on to the shaft, there are two prominences, the greater and lesser trochanters, which correspond to the tuberosities of the humerus.

From the trochanters the shafts return to the middle of the figure, so that the knees are close together, and the two thigh-bones form an inverted isosceles triangle, which in a good figure is almost entirely filled up by the adductor muscles of the thighs.

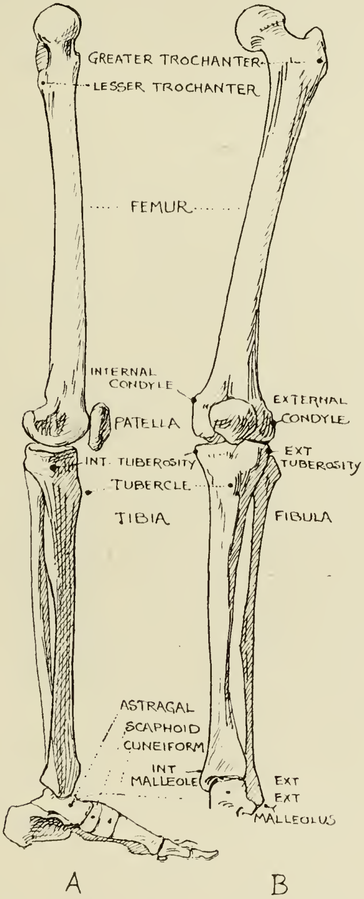

FIG. 133.—The Bones of the Lower Limb.

A draughtsman must certainly know the bones, and be able to draw them with considerable accuracy, from memory, especially if he has to work without a model.

Of the upper part of the femur only the *trochanter* reveals itself upon the surface, but its solitariness is balanced by its importance.

The lower end of the femur contributes very largely to the form of the knee, although it shows itself but rarely. Its shape may be gathered from Figs. 133 and 141.

The tibia has two broad ends connected by a shaft triangular in section. Of the three sides of the shaft, one is directed immediately backward, one to either side. There is thus a ridge in front, between the two side surfaces, which is called the crest. It is remarkably sharp, and rising to the skin forms the easily felt, and damaged, shin.

Above and below, the crest expands into triangular surfaces, approaching the flat, and forming the front of the two ends.

Just where the crest expands to form the upper triangle is a rough eminence, the tubercle, to which the ligament of the patella, or one might almost say of the triceps of the thigh, is attached. Above the tubercle the surface becomes broader and fairly flat. The surfaces on either side of the crest follow its course up the sides of the triangle, to which they add bevelled sides, as it were, as if this upper end of the tibia were half a hexagon in section. But at the fibula, or outer side, is a definite flatness, while on the inner side the internal edge of the triangular shaft sends up a gracefully arched bracket, almost a true semi-circle in plan, and extending from the flat triangular surface on the front, to the middle of the back. This is the internal tuberosity, and is shown in Fig. 133, A.

Viewed from above, the upper end of the tibia appears kidney-shaped, the double curve of the outline being behind.

At its lower end the tibia is somewhat oblong in section. The triangular surface provided by the expanded crest forms one side, the internal surface of the shaft another, while the back and fibula side provide the remaining two.

The transverse axes of the two ends of the tibia are not in the same plane. The bone is twisted. If the upper end be directed immediately forward, the lower end will be directed outward somewhat, the foot turning out with it. So that with the heels and toes together, the knee is rolled inward. In the natural attitude the toes are apart, the angle between the feet being perhaps 45 degrees. Attitudes in which the heels and toes are together are not ungraceful if one knee folds before the other, but it is distinctly ugly if both legs are straight. Nor is an attitude necessarily ungraceful if the feet, while some distance apart, are parallel, or even nearer together at the toes, and there are very many positions which are exceedingly graceful; but out-turning feet are the rule in standing positions. A seated figure does not turn the toes out so much.

The fibula is a long narrow bone with enlarged ends, the lower of which forms the external ankle; the upper receives the biceps muscle from the thigh.

Taken together, the tibia and fibula are narrowest about four or five inches up their shafts. As regards curvature, it may be noted that the internal surface of the tibia is very slightly convex above, concave below, while in profile the crest appears slightly concave below the tubercle, then convex, and concave again above the ankle. The bones of the foot are mentioned in paragraph 72.

66. The Muscles of the Lower Limb.

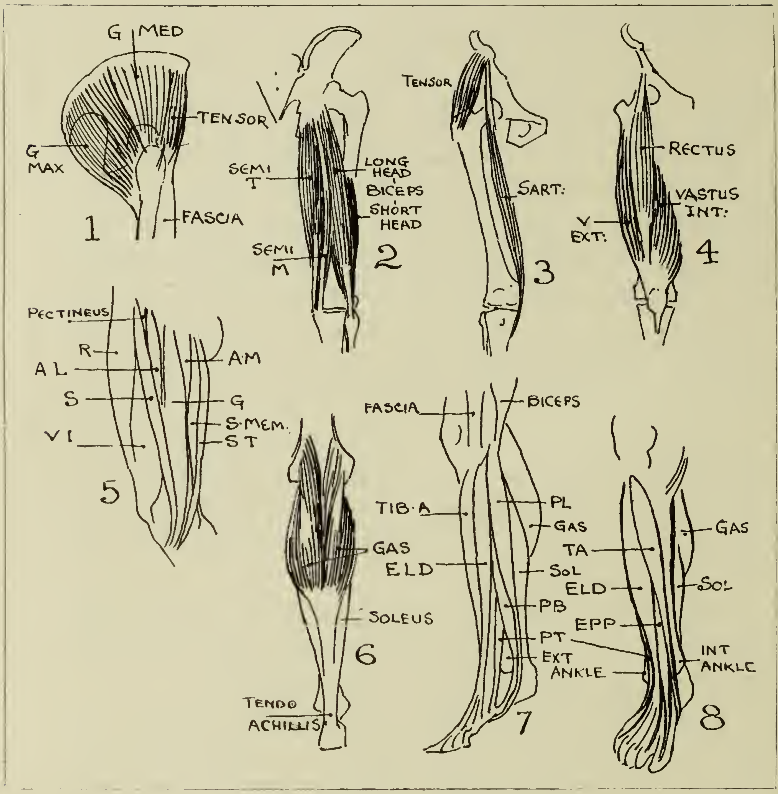

FIG. 134.—The Muscles of the Lower Limb.

I. THE GLUTEAL MUSCLES.

Gluteus maximus.

Attachments—Lower border of sacrum and coccyx and adjacent portion of ilium—Upper part, over the trochanter to the fascia of the thigh. Lower part, back of the thigh-bone below the trochanter.

Gluteus medius.

Attachments—Upper part of outer surface of ilium—outer surface of greater trochanter.

Gluteus minimus (concealed beneath the tensor and gluteus medius).

Attachments—Lower part of outer surface of ilium—front of greater trochanter.

Tensor vaginæ femoris (tightener of sheath of thigh).

Attachments—Superior anterior spine, and behind it,—fascia of the thigh.

II.

Semi-membranosus.

Attachments—Back of tuberosity of ischium—back of internal tuberosity of tibia.

Semi-tendinosus.

Attachments—Back of tuberosity of ischium—inner side of front of tibia.

Biceps cruris.

Attachments—Long head, back of tuberosity of ischium—short head, lower two-thirds of back of shaft of femur down to the external condyle—head of the fibula.

III. Sartorius and Tensor.

Sartorius.

Attachments—Superior anterior spine — Inner side of front of tibia.

IV. The Triceps Cruris.

Attachments—Vastus externus—Outer side of back of femur—by the common tendon to the patella.

Crureus—Upper part of front of femur—by the common tendon to the patella.

Vastus internus—Inner side of back of femur—by the common tendon to the patella.

Rectus—By two tendons, to anterior *inferior* spine of pelvis, and above the acetabulum—by the common tendon to the patella.

V. The Adducent Flexors.

Pectineus.

Attachments—Pubes and part of ilio-pectineal line above it—Behind lesser trochanter, on the shaft of the femur.

Adductor longus.

Attachments—By a narrow tendon to pubes—middle third of back of shaft of femur.

Gracilis.

Attachments—Pubes, on the part (ramus) descending to the ischium—Inner side of front of tibia.

Adductor magnus. Outer border of ischium—whole length of back of shaft of femur.

VI. Gastrocnemius and Soleus.

Gastrocnemius (double except in tendon).

Attachments—By two heads to back of condyles of femur—back of os calcis by the tendo Achillis.

Soleus.

Attachments—Back of head of fibula, and part of the upper fourth of both tibia and fibula—Back of os calcis.

VII. Outer View of Leg.

Peroneus longus.

Attachments—Head and upper half of outer surface of fibula or peronē—Under side of base of metatarsal of great-toe.

Peroneus brevis.

Attachments—Outer side of fibula below peroneus longus—Tuberosity of fifth metatarsal bone.

Peroneus tertius.

Attachments—Lowest fourth inner surface of fibula, facing the tibia—Top of base of fifth metatarsal bone.

VIII. Front View of Leg.

Tibialis anticus.

Attachments—Upper half of outer surface, facing fibula, of tibia, up to the external tuberosity—Under side of first cuneiform and first metatarsal.

Extensor proprius pollicis (proper extensor of great-toe).

Attachments—Middle portion of inner surface of fibula—base of last phalanx of great-toe.

Extensor longus digitorum (long extensor of toes).

Attachments—Upper part of inner surface of fibula and external tuberosity of tibia—last phalanges of four outer toes.

The following are hidden beneath the gastrocnemius and soleus. Their tendons pass behind the inner ankle. Of their bodies, a few inches of flexor digitorum, only, appear above the inner ankle between the tibia and the soleus, but greatly enriching the form.

Tibialis posticus.
Attachments—Back of tibia, facing the fibula, and inner side of fibula—Tuberosity of scaphoid bone.
Flexor longus pollicis (long flexor of great-toe).
Attachments—Back of fibula below soleus—under side of base of last phalanx of great-toe.
Flexor longus digitorum (long flexor of fingers). Back of tibia, below soleus—third phalanx of four outer toes.

67. Remarks upon the Muscles of the Lower Limb.

A CLOSE description of these muscles will not be necessary if the student will get to know the general character and position of them as they are given in the preceding paragraph, and will attend to the following remarks.

The *gluteal* group corresponds to the *deltoid* of the arm, but, unlike it, does not gather into a point upon the bone, but surrounds the trochanter, which consequently shows as an eminence.

The proper action of these muscles is abduction ; but connected with it is rotation inwards and flexion for that part of the mass which is before the trochanter, and rotation outwards and extension for that part which is behind. So that in turning the thigh to look at the heel, the tensor will be seen to swell up into a roundish mass, and similarly the maximus becomes more concentrated when the leg is held out, and behind, and particularly when the figure is standing upon one leg.

The *fascia lata* is a tendinous sheath enclosing the thigh, and chiefly evident on the outside. It is supported and tightened above, by its proper tensor and the gluteus maximus. Below, it becomes a tendinous strip, and passes over the knee-joint on the outside, looking very like the tendon of a muscle. (See Fig. 142.)

The *tensor fasciæ* arises from the superior anterior spine, as well as from behind it. At the spine it is in close connection with the sartorius muscle, which passes to the inner side of the thigh, and thus makes with the tensor an inverted V. (Fig. 138.) The two muscles present a very convenient start point for the study of the muscles of the thigh.

The *sartorius* forms an important and beautiful line dividing the extensor muscles on the front of the thigh from the adductors at the inner side of it. It shows most when in action, in drawing the heel up to the knee, its uppermost part appearing as a prominent strong cord, its middle and lower as a depression.

The *triceps* extensor of the thigh consists of rectus femoris, vastus externus, and vastus internus, the upper part of which, hidden under the rectus, is called crureus, and is sometimes considered as a separate fourth head.

The patella is a movable fulcrum by means of which the triceps gains greater power in its action upon the tibia, or leg-bone. The tendon that connects the patella with the tibia belongs then to the triceps, and it is better to consider the muscles as inserted into the tibia.

The tendons and aponeuroses of the triceps affect the form somewhat. Thus the vastus externus is attached to the femur by an extensive aponeurosis which covers its upper three-fourths, and renders the surface tight and stiff. The vastus internus, on the other hand, has no such aponeurosis upon it, and it is therefore more fleshy or flabby. The tendon of origin of the rectus also comes upon the front of the muscle, and helps to keep it down between the tensor and sartorius, than which it is originally placed lower by being attached to the inferior instead of the superior spine of the ilium.

Below, all these muscles meet upon a common tendon, taking however different sides of it. The internus crowds down upon the patella, the externus and rectus not reaching down so far, and in action retiring even further up.

It will probably be found that the superficial muscles from vastus internus round the inner side of the thigh to vastus externus, or the flexor-adductor mass, will be best remembered in their proper arrangement by classifying them according to their destinations. Thus there is a group coming round the inside of the knee, and somewhat to the front of the tibia below it; another group find their insertions on the thigh-bone; and a third and last at the back of the knee.

The group that comes to the front of the knee comprises—

Sartorius,
Gracilis,
Semi-Tendinosus,

—placing them in the order of their insertions from the knee downwards.

The group at the back of the knee-joint—

Semi-membranosus,
Biceps cruris,

—Biceps being at the outside.

Those attaching to the shaft of the femur are—

Adductor magnus,
" longus,
" brevis,
Pectineus,

—of which brevis is deep.

But while this classification may be of assistance in remembering the arrangement of the muscles, it is of little use artistically; for the inner side and back of the thigh are virtually one well-rounded fleshy mass, with hardly any, or only very subtle, features. Or rather there are two masses, the one just spoken of being the more important, and there being another formed by the lower parts of several muscles, and showing prominently at the back and inner side of the knee and thigh together. (See Fig. 140, 4.)

Of the tendons, it is needful only to specify the tendon of origin of the adductor longus against the pubes, which is narrow and shows clearly, and the tendons of insertion of the biceps, semi-membranosus, and semi-tendinosus. These are situated on the outside of the muscles, and therefore even in well-fleshed persons show as definite cords, very much in the same way as the tendons of the sterno-mastoids in the neck; and then only when the knee is bent.

The adductor magnus is almost all concealed, while the semi-membranosus not only manages to hide itself for most of its course, but in spite of its tendon being placed further back than that of the semi-tendinosus, it allows that muscle to appear at the back of the thigh in close company with the biceps.

The division between the biceps and semi-tendinosus shows but very slightly indeed, and is virtually neutralized by the skin and fat above, so that it may be disregarded.

The muscles of the leg are perhaps the easiest of all to remember. They arranged themselves in groups of three each; thus, counting the gastrocnemius as two, on account of its double character, there are three behind, the soleus being the third. There are three flexors (deep posterior group), tibialis posticus, flexor digitorum, and flexor pollicis. Three outer or peroneal, peroneus longus, brevis, and tertius; and three extensors in front, tibialis anticus, extensor digitorum, and extensor pollicis.

Then just as the flexors in the fore-arm need not be considered in detail because of their not separately affecting form in any methodical manner, so the flexors of the leg may be overlooked because they are hidden under the gastrocnemius and soleus. Their three tendons pass round the internal malleolus, where they may possibly show, and where the flexor longus digitorum fills up the three or four inches between the soleus and the tibia bone.

The superficial posterior group consists of gastrocnemius and soleus. The shape of the former is well known, or rather the two masses of the calf are. It arises from above the knee in a rather remarkable manner. Two full fleshy strips, or one might say ropes, pass vertically over the knee-joint, and form the inner borders of the two bellies. There is no space between them, but at their upper extremities they part company somewhat in order to fit upon the massive condyles of the femur. At the outer side of each of these ropes is a long spreading aponeurosis which covers a large part of the mass proper of the muscle. These ropes and aponeuroses are very important. The aponeuroses lie down close, and harden the surface of the muscle, so far as they cover it; so that each belly of the calf becomes triple in form, with an outer fleshy border, an aponeurosis, and an internal "rope."

The two bellies end upon a common tendon, which lower down becomes the *tendo Achillis*, to which also the *Soleus* muscle attaches itself. The soleus is a valuable addition to the form of the leg. Without it there is an appearance of scragginess. It is a great characteristic of the female leg, for the shortness of the tendons in that sex allows it to creep down close upon the ankle. The tendon of the calf passing over the soleus renders it flatter in the middle, the lower part of the gastrocnemius, narrower than it, reveals its shape upon it, as in Fig. 139, C. The outer group, peroneus longus, brevius, and tertius, take their names from *peronē*, the Greek for the fibula bone from which they arise. They occupy only a narrow strip on the outer side of the leg, corresponding in fact to the fibula bone. Their tendons sometimes give students a little trouble, because of the extraordinary course of that of peroneus longus. It passes behind the external ankle, and under the foot to the base of the metatarsal bone of the great-toe. But it is not difficult to remember which muscle does this, if it merely be noted that it must have a very long tendon indeed, and the name peroneus *longus* tells us at once.

Peroneus brevis and tertius are very similar, that is, they both go to the metatarsal bone of the little-toe, brevis passing behind the ankle, tertius coming down before.

Peroneus tertius is sometimes classed with the anterior group—tibialis anticus, extensor digitorum, and extensor pollicis. Of these the first two are very important, their forms show very distinctly, and their direction is oblique, from the outer side of the knee. The extensor pollicis comes out from between their lower ends.

Taking the two ankles as the limits of the front, there are between them four tendons, one on either side going to the tarsus, or metatarsus, not to the toes that is, while between them come down the tendons of the extensors of the smaller toes, and of the great-toe. The tendon for the smaller toes almost immediately splits into four. As to the order of arrangement, the peroneus tertius is of course on the fibula side, and the extensor of the great-toe on the inner side of that of the fingers, or smaller toes.

68. The Hip.

THE pelvis is the bony basin of the hip. It expresses itself in external form only in the iliac crest and the sacrum. The leaf-like sacrum is held between the two ilia, the upper borders or crests of which are somewhat in continuation with its sides, and form a bony line on the back and sides of the figure, separating the trunk from the thighs, and being in shape similar to a letter M, drawn with the outer lines very slanting. It is important to recognize this zigzag course of the bony line. The lower part of the central or descending angle of the M corresponds with the sacrum. Two dimples (Fig. 135), representing the posterior spines, terminating the crests behind, mark the lateral extent, as seen on the surface, of the sacrum, and are further apart in the female. The two upper angles of the M are provided by the iliac crests (Fig. 77), but are in both sexes softened away considerably, the crest having in the female only a low and gentle curvature, with a degree of the angularity here suggested.

Below the bony line just traced, and converging upon the trochanter in a radial manner, are the several muscles of the gluteal group, forming the most noticeable feature of the back view. Above the bony line are the sacro-lumbalis muscles upon the sacrum and the external oblique, or the mass which may be named from it, above the crest, and stretching up to the waist.

The importance of the crests as details of form cannot but be apparent ; in male figures they are generally very evident, and seem to place an upward limit to the thigh unlikely to be lost. In female figures, on the contrary, the crests are often too subtly revealed to be drawn with precision, and the thigh and hip may be said to continue up to the waist. In a male figure our attention will fasten upon the crests and the trochanters beneath them, but in a female we shall probably draw a bold curve from the waist round to the knee. (Fig. 135, B.) But although the crest in the female is thus lost within the form, its influence is very great. It is across the ilia that the

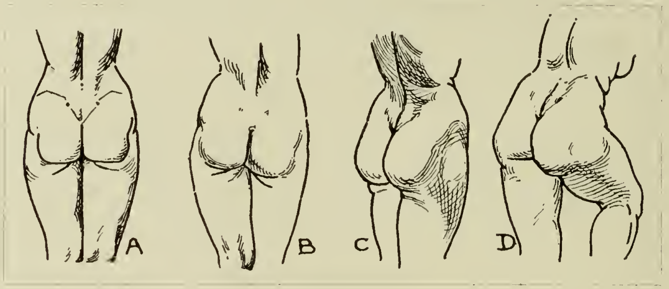

Fig. 135.

female is so distinctly wider than the male. The measurement across the trochanters is slightly greater in a woman three or four inches shorter in stature than a man. Her greatest width is, however, lower than the trochanters, being below the horizontal gluteal crease (Fig. 135, A); in the male this augmentation of width is not so pronounced. But it is the great width at the ilia, followed just above by the rapid diminution to an equally narrow waist, that gives this region in women its distinctly feminine appearance. Indeed, one might say that the projecting ilium in the female makes a kind of shelf, and this description is confirmed by the manner in which women carry things on their hips.

In the male the crest is generally well expressed by the modelling of the external oblique (see p. 135), which runs backward round the flank in a somewhat upward direction (Fig. 136, A and B), but does not descend into the inner angle of the M. It borders upon the crest, but in the female the mass which may be regarded as similar, though owing much of its volume to fat, overlaps the crest, and suggests it rather by showing that it is riding over some

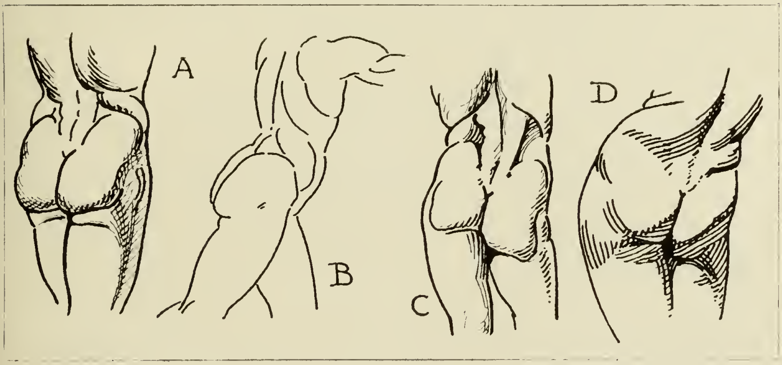

FIG. 136. (Of these, D is female.)

prominent substructure, than by stopping short against it. This may be followed in Figs. 135 and 136, D. In all these it will, however, be seen that it is not a simple arc that falls from the waist over into the hollow above the trochanter; it becomes hollowed or angular a little where it crosses the crest. In certain views an angularity is given to the outline, as if the descending line from the waist had to project outward considerably before turning downward. The effect may be seen in Figs. 135, C and D, and 137, B.

When the female figure is at all bent backward, as in Figs. 135, C, and 136, D, the mass above the crest becomes bulged outward, and consequently the crest itself becomes suggested as a depression, or crease.

The sacrum is not flat, but slightly convex, from above downwards, and the muscular masses upon it express themselves throughout its length, with the slight channel between them, which continues right up to the head. In women these forms are more delicate than in men, although the sacrum is wider.

The flatness at the back of the female hips, extending up to the waist, has been alluded to on page 119, and illustrated in Fig. 93.

The lower part of the gluteal mass, provided by *gluteus maximus,* projects backward a little more than that part of the gluteals which ascends into the upper angle of the M. So that from the highest point of that angle down the whole extent of the mass is not a clear simple curve, but a double one, as shown in the profile. (Fig. 136, B.) It would be simplest in that of the free leg of Fig. 136, C, and most pronouncedly doubled in the standing leg of that diagram.

When the glutei are engaged in abducting, a deep sinking is noticeable above the trochanter, answering to the termination of their fleshy fibres, and the commencement of their tendon or aponeurosis. This sinking accents the flatness of the side of the hinder part of the mass. The hinder part is narrower from side to side than across the tensors which occupy the fore part. (Fig. 137, A.) Thus is completed that alternation spoken of on page 137, concerning the width of the trunk above and below. It was there said that above, the greater width in the region of the chest was at the back, and provided by the latissimus dorsi, while below it was before. So that descending a step lower to the hips the contrast is even greater, the narrow part behind being palpably narrower, while there is across the front of the middle of the figure a flatness more nearly similar to that at the back of the shoulders than that provided by the abdomen. This flatness across the front of the middle is more pronounced in women.

Then again, the rounded forms at the back must not be drawn circular, but irregularly ovoid, sometimes squarish, as in Fig. 136, C, sometimes with a double line.

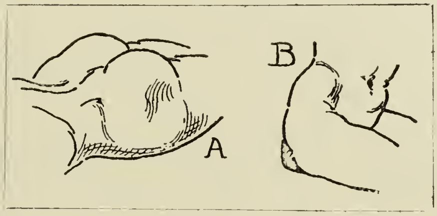

Fig. 137.

According to the position, so is this hinder part shorter or longer. Thus, with the standing leg, it is generally short, square, and has a notable crease or two below it, creases which indicate the biceps mass at the back of the thigh, a mass which does not entirely extend across to the outward. With the free leg the hinder mass is generally longer, and more flabby. But if the free leg is at all extended, or abducted, the glutei will gather into a hard mass.

The muscles forming the gluteal group correspond to the deltoid of the arm, and are *ab*ductors of the thigh. Unlike the deltoid they do not mask the bone they operate upon, but there is nevertheless considerable similarity in form. The deltoid gathers its bundles together and plunges down to the bone between the biceps and triceps. So almost exactly does the gluteal group, for there is a biceps and triceps of the thigh, and it is between these that gluteus maximus reaches the bone. The outer corner of the prominent hinder mass, which is commonly regarded as very circular, creeps down then, as indicated in Fig. 139, B, and less emphatically in Fig. 136, C. The inner corner, too, must be kept rather square, for the two masses lie close together, as may be best seen in Figs. 135, B, and 136, C and D.

In Renaissance times these parts were generally drawn with full strong curves; but in the period when flabbiness was the fashion, and the flesh looks as if it would stay in any form into which it was pushed, the outline was much squarer, somewhat as in Fig. 138.

The mass produced by the projecting trochanter is stronger and more evident in women (Fig. 135, C and D) than in men. The trochanter generally shows as if divided vertically by a subtle depression, and not as a portion of a sphere.

69. The Thigh.

If we epitomize the essential characteristics of a thigh they will appear as in A and B, Fig. 137. We have been speaking considerably, in the last paragraph, of the crest of the ilium. It appears now as supporting by its front end, or superior anterior spine, two muscles which are very important as regards the form of the thigh. These are the Tensor fasciæ, T, and Sartorius, S. Tensor is one of the gluteal group, and corresponds very fairly to part of gluteus maximus, for they both attach to, and tighten, the tendinous sheath of the thigh. It runs to the region of the trochanter. Sartorius is very long, extending down as far as the tibia, or leg-bone, and its course may be traced in Fig. 138, B, by its being the uppermost muscle of the mass there illustrated. When in action most of its length buries itself in the thigh and makes a depression, but its upper part remains isolated, and becomes thus a fitting companion to the short tensor with which it is here associated. The importance of these muscles lies in the fact that they are inserted higher than the muscles on the

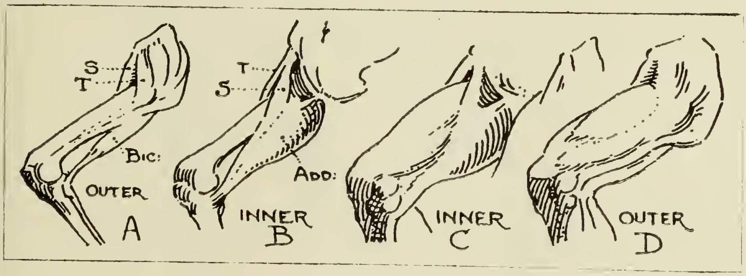

FIG. 138.

front of the thigh, and that consequently their form and the space between them are often well seen. Compare the other illustrations in this paragraph. Behind these muscles are shown the glutei.

In Fig. 138, A the biceps is also represented, with its ham-string tendon, and although it is not here shown in its proper bulk, it will perhaps all the more forcibly express that character which a thigh has of being bone before and tendon behind. Biceps is on the outer side of the thigh, and is edged by a longitudinal channel of slight depression marking the division between it and the triceps of the front. The ham-string character thus exhibited is repeated on the inner side, B, where other tendons come down in much the same manner. (See Fig. 139, B and C.)

Our next characteristic form is the adductor mass as epitomized in B. It consists of adductors, adducent-flexors, and flexors, but the subdivision into separate muscles is so indefinite as to smoothen all of them together into a fairly full mass, which is nearly always round in section in its hinder part, but square-sectioned in its front portion

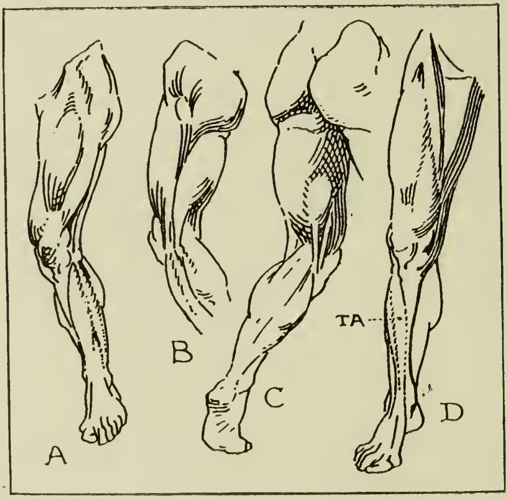

FIG. 139.

when *adductor longus* is at all evident, as in Fig. 139, D. The tendon of this muscle is the only one that shows itself at the upper part against the pubes, and is suggested in the diagrams.

The mass of the adductors, as given in Fig. 138, B, is diagrammatic, and not completely accurate. The adductors themselves are inserted into the femur, whereas in the diagram an insertion into the tibia only is shown.

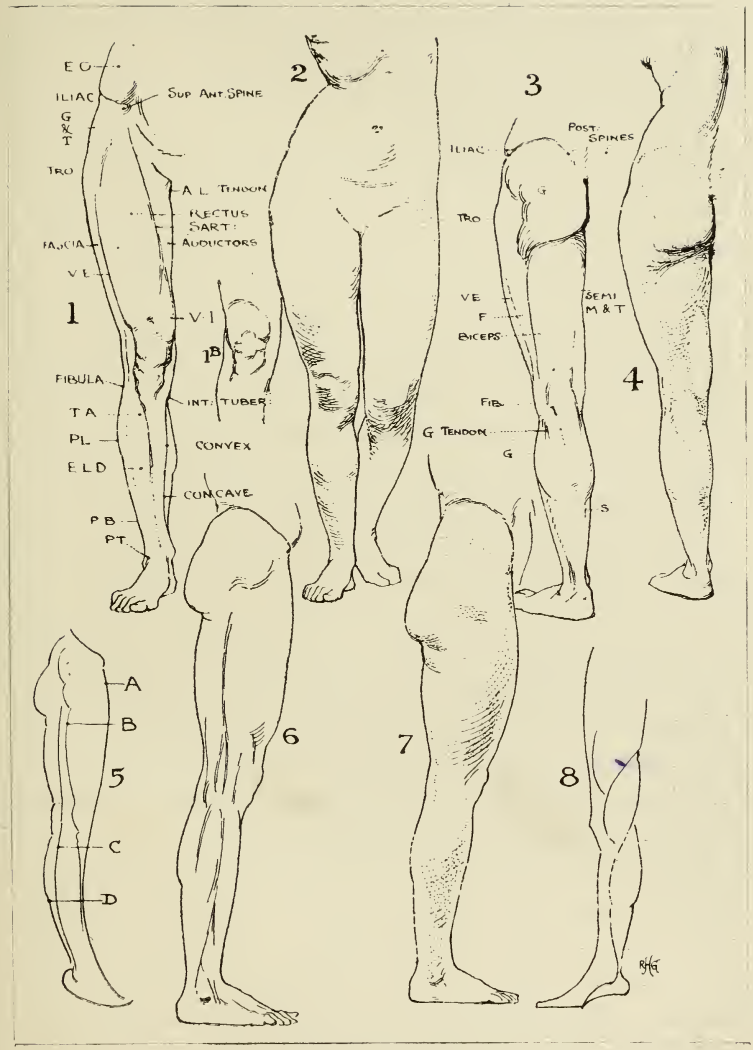
E O
ILIAC
G & T
TRO
SUP ANT. SPINE
A L TENDON
RECTUS
SART.
ADDUCTORS
FASCIA
V E
1
V.I
1B
FIBULA
INT. TUBER.
T A
PL
CONVEX
E L D
CONCAVE
P B
PT
2
3
POST. SPINES
ILIAC
G
TRO
V E
F
BICEPS
SEMI M & T
4
FIB.
G TENDON
G
S
A
B
5
C
D
6
7
8
RHG

FIG. 140.

This is because it is the more important, or rather they are, for there are three muscles inserted side by side. Their names, reading downwards from the knee, are Sartorius, Gracilis, and Semi-Tendinosus.

What is particularly important to notice is that there is a convex curve around the main body of the adductors, then a concavity, and then another convexity which wraps round the knee and includes the inner side of the head of the tibia in the thigh. And this outline runs on down the tibia bone to the inner ankle.

If we turn to a back view of a standing leg we shall see a similar duplication of form in the modelling. Fig. 140, No. 4, will illustrate the matter. On the inner side above the knee is a prominent mass of modelling, with a larger mass placed obliquely above it, formed of the upper part of the adductors and flexors fused with the biceps.

The front of the thigh is covered by the triceps, the details of which are the details also of the appearance of the limb.

A comparison of the front and back of the thigh will show that the extensors of the front are placed at a different inclination from the flexors at the back. The extensors pass from the outside of the figure to the knee; the flexors, from the inside, as if, as in truth is the fact, the gluteal mass had to over-cap their origins.

The thigh is seen at its widest when it is rotated outward a little, and the mass of the adductors combines with the extensors of the front in one broad, rather flat, surface. This is particularly to be seen in the free leg when the two are crossed; the standing leg appearing drawn and tightened, with the adductor mass raised, bulged, and apparently small, the line of the sartorius tightened, as well as the side of the thigh, where the fascia lata and aponeurosis of the vastus externus readily produce that effect. In this position also it may be noted how broad the knee of the free leg appears, while that of the standing leg appears narrow, and tightened above.

The inner line of the thigh must be expressive of the softness of that side; compared with it, the outer line is rigid and stiff.

The front view of the thigh may be represented by three lines—the outer, the sartorial, and the inner, which may be followed in No. 1, Fig. 140. The outer, commencing from the iliac crest, presses in the least degree beneath that bony ridge; then it describes a slow curve over the gluteus medius or the tensor; then in thin persons it possibly dips slightly before it passes over the trochanter, after which it describes a long, slow, hard curve for the fascia and vastus externus, followed by a convex curve over the knee-joint produced either by the tendon of the biceps, or of the fascia.

The sartorial line, after a slight suggestion of the superior spine, pursues a course beside the rectus and vastus internus.

The inner line commences by a short straight line passing outwards, followed by a curve for the adductor mass, to which succeeds a concavity followed by another curve which passes round the knee-joint, and arrives upon the front of the tibia. The curves are not arcs of circles, and a great deal of angularity or squareness becomes evident when the muscles are in action.

Turning to the back of the thigh, there are to be noticed one or two creases beneath the gluteus. These creases limit also a small surface better seen in the side view, and which is much more prominent in women. It widens, but becomes lost, as it passes outward; the creases take a downward direction from the middle line.

It not unfrequently happens in the body that forms will appear on the surface of muscles exactly the opposite of the direction of the muscles themselves. This is due to transverse massing of their fleshy parts, and to transverse creasing. The longitudinal position of the biceps and semi-tendinosus at the back of the thigh is very evident on the external form, as also is the fact that their origin is towards the inner side under the gluteus; but there nevertheless appears a transverse mass, fleshy, well-rounded, and having no trace of the vertical division between the biceps and semi-tendinosus. It is more evident in women, and may be suggested by well-rounded curves, as in the diagram. Indeed one notable distinction between the male and female figures, is that the former has generally *longitudinal* muscular markings, the latter transverse modelling, as shown in Fig. 140.

The tendons of the biceps and semi-membranosus occurring on the outside of the muscles show as sharp cords, similar to that of the sterno-mastoid of the neck. And similar to those of the neck, they often glide into the fleshy mass of the thigh with as little breaking of the smooth surface.

70. The Knee.

THE patella is the most noticeable detail (A, Fig. 142). It is connected below by a tendon (B) to the tubercle of the tibia, which also shows, and forms the lowest part of the knee. On either side of the tendon the tuberosities of the tibia appear; that on the inner side

(D) presenting a broad curved surface continuing downwards into the shin, and above blended with the internal condyle (E) of the femur by the tendons of the sartorius gracilis and semi-tendinosus muscles, which pass over them. The outer tuberosity (F) appears as a small roundish prominence, not dissimilar from the head of the fibula (G) behind, and slightly below it. Between these two comes down the tendon of the fascia of the thigh (H) over the joint, which, it may be noticed, seems to hold up

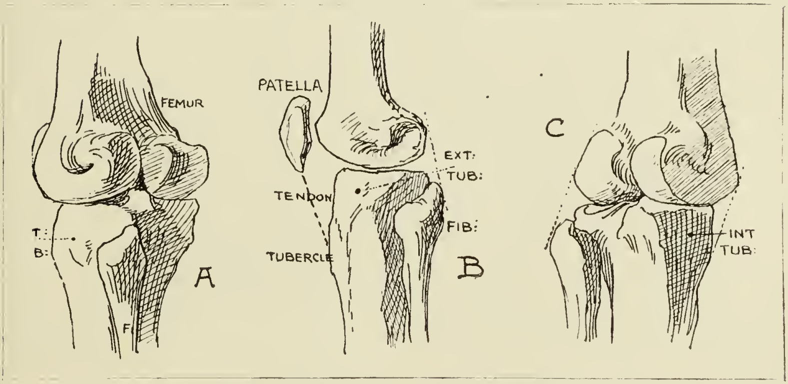

FIG. 141.—The Bones of the Knee. A and B, outer views; C, inner.

the muscular forms of the leg (J), while, on to the fibula, comes down the tendon of the biceps muscle (I). From below the tuberosity (F), the tibialis anticus and extensor longus digitorium pedis (J) start down the leg in an oblique direction.

Above the patella is the tendon (K) of the triceps, short on its inner side, often appearing very long in its outer, throwing, as it were, the mass of the vastus externus (L) high up. Vastus internus (M) crowds down upon the patella.

Very important are the fatty masses (N and O) due to the synovial membrane, and appearing above and beneath the patella on either side of the tendons, which however become embedded within them and obscured. Their bulk is increased by the skin; and in women the fatness of this region in the standing figure is very noticeable, while even the bent knee in that sex is soft and smooth. The female knee is, in fact, wider and much less bony than the male, and behind, the masses at the lower end

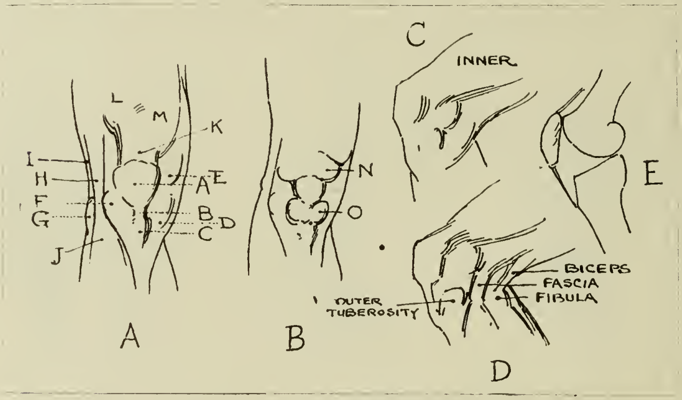

FIG. 142.—The Details of the Knee.

of the thigh are remarkably prominent, terminating abruptly as shown in Fig. 135, A. This prominence is probably due to the muscular fibres creeping further down the tendons in the female.

The fatty masses, evident in the straightened limb, disappear with extension,—compare Nos. I and I B, Fig. 140.

71. Drawing the Leg.

JUST as in the fore-arm the ulna has a subcutaneous portion which provides the draughtsman with a first line, so does the tibia in the leg. Its subcutaneous portion is its inner surface, facing the other leg that is, and becomes below, the internal malleolus or ankle. Above, this subcutaneous portion is limited by the insertion of the sartorius, gracilis, and semi-tendinosus, which however do not break the flow of its surface, but continue it up into the thigh. On its inner side it is bounded sharply by the gastrocnemius and soleus, and on its outer almost as sharply by the tibialis anticus, which comes from very near the head of the fibula. (Fig. 140, No. 1.)

It must be remembered that the subcutaneous portion is slightly convex in its upper half, concave in the lower. It is therefore wrong to make the whole line concave, as the designer is often tempted to do, especially after using the long flowing line A of No. 5, Fig. 140, true as that is in a general sense.

The internal ankle must project boldly, so that the shaft of the tibia seems set back behind the knee and ankle.

It has been said above that the muscles of the leg were divisible into four groups of three each. (See page 216.) As regards form we may think of them as constituting only two groups, and this arrangement corresponds to that of the fore-arm. Our two groups are the muscles of the calf, and those on the outer side of the front.

The reader will remember how in the fore-arm there is a group of extensor muscles radiating from the head of the radius, or the external condyle just above it. The outer group in the leg is precisely similar. On the outer side of the knee is the external tuberosity of the tibia, and behind and slightly below it is the head of the fibula. (Fig. 143.) These are the bony prominences from which the muscles radiate. One cannot omit to notice how the external tuberosity seems, button-like, to hold back the tendinous forms descending from the thigh. From this position three long muscles come down, tibialis anticus,

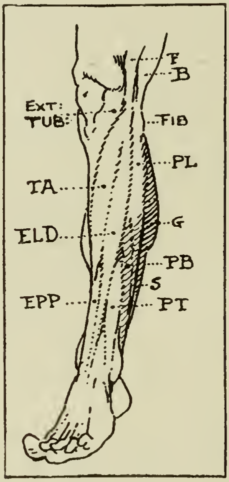

FIG. 143.

extensor longus digitorum, and peroneus longus. The obliquity of the first two is very important. In Fig. 139, D, it is seen to be fairly parallel to the oblique sartorius of the thigh.

Below, three shorter muscles are spliced up into these long ones, and may be readily followed in the diagram. Of them peroneus tertius is the most important, because it corrects that insipid curvature which would otherwise be suggested, and which is associated with chair legs.

The tendons of tibialis anticus and extensor digitorum show very prominently when in action, particularly when the foot is flexed on the leg, bent up, that is, as when one stamps the heel on the ground.

As to the modelling of the leg, the section at the widest part is roughly triangular. The outer surface comprises the muscles just spoken of, and ends upon the outer belly of the gastrocnemius. The peronei occupy a long narrow strip over the fibula, and readily remembered as suggesting the stripe on a soldier's trousers.

The posterior surface consists of the back of the gastrocnemius, with the soleus beneath it. The gastrocnemius being two-bellied is consequently rather flat behind. The flattening is, however, emphasized by the aponeuroses at the back of these bellies, as in Fig. 139, C. In the centre, between these aponeuroses, and passing over the back of the knee, are two "ropes" of muscle.

The mass of the soleus is flattened in its upper part by the tendon of the gastrocnemius passing over it. These details of form are of course seen in extension of the foot; in the normal positions they are softened almost away. (See Figs. 139, C, and 140, No. 3.)

The internal surface, consisting of the smooth subcutaneous portion of the tibia, the well-rounded border of the gastrocnemius, and the side of the soleus, is the most heavily modelled of the three. (Fig. 139, D.)

The two sides of the leg are not symmetrical with one another. In the accompanying diagram (Fig. 144, A), the slanting lines indicate that the knee comes lower down on the inner side, that the inner head of the calf is lower, that of what is seen of the soleus the inner curve is smaller but higher, and that the inner ankle is the higher.

As regards the curves, those on the inner side are rounder than those on the outer, but the first part of the calf on both sides is rather flat.

A similar flatness on the calf is seen in the side view, B, and behind the knee in the same the central roll provided by the two gastrocnemii, and which forms a feature of the back view of the knee when extended.

By the side view also it may be seen how the knee descends much lower before than behind, and how the

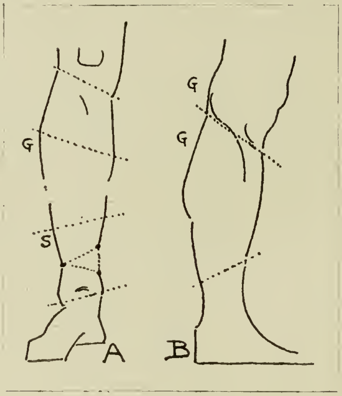

Fig. 144.

curve up from the foot over the ankle comes higher up the shin than does the one from the heel up the back of the leg. Between these, on the front is the convex curve of the crest of the tibia between its two concavities above and below. It is interesting to note that the slanting lines in this diagram correspond to the limits of the breeches and boots of the Romans.

The knee must always be expressed by convex curves of its own, and not regarded as merely the junction between the thigh and leg.

72. The Ankle and Foot.

THE skeleton of the foot shows it to be composed of two parts or systems, one belonging to the heel and ground, the other to the ankle and leg. The one seems to imply the stationary and the other the active position. The heel-bone, os calcis, supports both systems, and both are arches, though the horizontal or ground

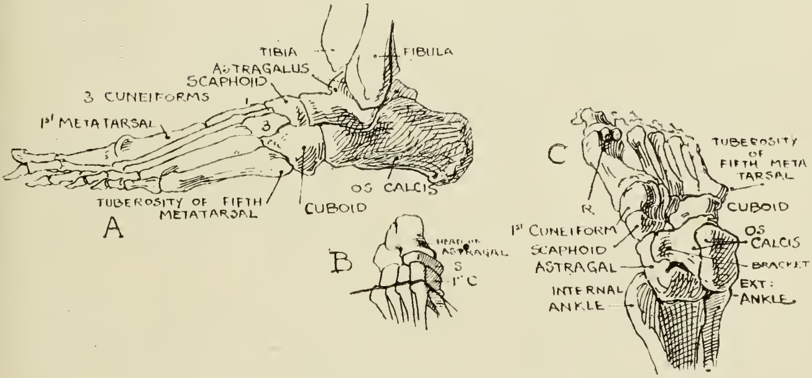

FIG. 145.

system on the little-toe side is much less arched than the other.

It is perhaps best to consider the os calcis as situated on the little-toe, or outer, side, although it supports both. Its support of the inner arch is by means of the astragalus, the bone which makes the ankle-joint, and which it supports chiefly by a bracket. From behind, the heel is distinctly seen to be on the outer side. (Fig. 145, C.)

The body of the os calcis coming directly forward articulates with the cuboid bone of the tarsus, and the cuboid supports the two outermost toes.

The bracket of the os calcis supports the astragalus or talus, which, projecting forward, supports the scaphoid, which itself articulates with the three cuneiform, each forming a base for one of the first metatarsal bones.

But while these two systems are very complete in themselves, they harmonize with one another and articulate where they meet.

Transverse sections before the ankle yield the facts that the two systems do not form one clear surface till the cuboid and cuneiform bones are reached. Of these, the middle cuneiform is the highest, the surface falling slowly by a gentle curve over the third cuneiform and the cuboid, and toward the great-toe side by a very much more precipitous course over the first cuneiform, which presents a rather deep face. Indeed it is no exaggeration of fact to say the surfaces declining either way from the middle cuneiform are at right angles to each other. (Fig. 145, B.)

Between this row of cuneiforms and cuboid and the ankle, the harmony of surface is not continued, the outer system lying low compared with the inner, which continues to rise. The bone behind the cuneiforms is the scaphoid. From above it appears as a parallelopiped, a brick-shape, with the end declined outward according to the declivity seen in the other bones, while its long side agrees with the first cuneiform and points inward. Behind the scaphoid is the head or forward part of the astragalus.

The effect of these particulars is to confine the rising arch of the instep to the inner border; the foot must therefore be kept depressed a little in front of the external ankle.

The forward portion of the foot is characterized by the great strength of the great-toe, and its metatarsal bone, by the smallness of the phalanges of the four outer toes, and by the great protuberance at the base of the fifth metatarsal. Taking this great protuberance into consideration, the five toes make, with their metatarsal bones, a fairly parallel mass, when seen from above. In the side view there is a degree of convergence toward the toes, owing to the height of the instep, but even then the

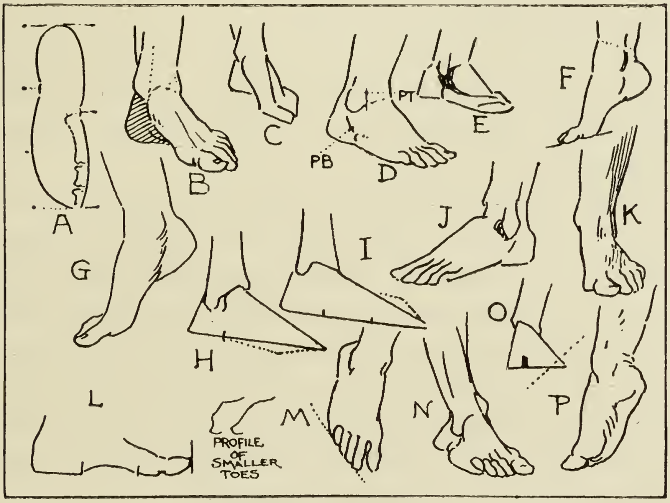

FIG. 146.

parallel characters of the two borders is not wholly lost, and although rather gruesome and unpleasant, is frequently to be seen in Michael Angelo's drawings. Fig. 146, J, will illustrate the matter, as well as another peculiarity of some of the master's drawings. This is the hollow in the ankle, at the top of the instep. (Compare Fig. 145, A.)

The underside of the foot shows distinctly the two systems spoken of above. There thus appears a hollow or valley between them (see Fig. 145); the one system, including the great and two adjoining toes, makes its way down toward and dies into the tibia; the other, including the two outer toes and the heel, is rendered more distinct by a muscle, abductor minimi digiti pedis, which passes from the os calcis to the base of the little-toe. A similar muscle, abductor pollicis pedis, passes from the os calcis to the base of the first phalanx of the great-toe, thus bridging the valley in the sole, and rendering the two sides much more alike.

This muscle is perhaps the only one that need be mentioned, and it only because it fills up to some extent what would otherwise be a very deep hollow under the inner ankle.

Beside the tendons which come down from the leg, there are no others that assert themselves, excepting perhaps the tendons of extensor brevis digitorum. This muscle arises under the external ankle, and sends forward four tendons which arrive at the bases of the great and next three toes beside, and connecting with the tendons of the long extensor, which comes down from the leg. The tendons of the short extensor thus make a small angle with those of the long extensor.

Viewed from above, the inner border of the skeleton of the foot appears as two convex curves, each occupying about one-half the length. The hinder curve represents the tarsus and heel, the fore the great-toe and its metatarsal bone. Thus the ball of the great-toe, at the junction of the metatarsal and first phalanx, is thrown outward. The pinching together of the toes in modern boots make it project even more.

The constriction of the outer side occurs further back, just behind the tuberosity of the fifth metatarsal.

Both the internal and external ankles are longer, vertically than wide, and in shape something between an oval and a diamond with its upper point greatly elongated. The reader will hardly need reminding that the inner is much the higher in position.

In considering the drawing of the foot we will take the inner and outer views (Fig. 146, B and D) as the most frequently used. We have seen that the bones of the foot are arranged in two systems, one inner, connecting the great and second toes with the tibia; the other, outer, connecting the three last toes with the heel.

The most diagrammatic form of the foot in these positions is triangular, as at H and I. The heel should be kept well pointed behind, not because it is more beautiful if more projecting, for the contrary is the fact, but because it is generally neglected by students. If the foot is to be seen in outer view an extra triangle is added on the lower line for the little-toe (H); if in inner view, a triangle must be added above, on the upper line, for the little-toe and the parts about it (I). Then the ankles will differ. In the outer view (H) the joint will fall down toward the heel, the outer ankle being low, the inner very high; in the inner view the joint will be almost in line with the upper outline, and the low outer ankle will be hardly seen.

We shall next place the instep before the ankle, but it keeps upon the inner border of the foot as it is formed by the system or arch connecting the great-toe with the tibia. In the inner view this connection will be very plainly seen (B and C), there being a palpable vacancy under the arch of the instep. The under line will come suddenly down to the ground behind the ball of the great-toe, and may then come forward along the ground as a straight line, as in C. The far side of the instep in this

R

view will be well rounded, and will die away in front of the smaller toes.

In the outer view the instep will fit, somewhat buttress-like, down upon the horizontal system of the foot. The heel occupies about one-third of the total length, ceasing a little before the external ankle. If we draw a line down from the ankle to this point it marks an important division, for on both sides of it the border diverges outward, so that the heel and the little-toe-ball enclose a very large angle, and the heel of D is thus turning outward to face the spectator. Below the ankle in this diagram is a small stroke corresponding in position to the tendon of *peroneus brevis*. On the front is *peroneus tertius*.

Having drawn the heel, squarely, and marked the division spoken of, a full curve may be drawn all round the ball of the little-toe, and the small toes, massing them together.

The ball of the little-toe must bulge out softly, and must be of sufficient volume to suggest a sixth toe, not yet fully developed. In N it is given in an exaggerated form, and as if squashed from under the foot by the pressure upon it. Its outline is a subtle, but not a single, curve, and the little-toe occurs high upon it, the ball intervening somewhat between it and the ground. In such views as M the ball will make the outline not the little-toe, and care must be taken never to let the little-toe, or little-finger, make a straight line with the outer border.

The proportions of the inner side of the foot are shown in L, one-third is occupied by the heel, the arch, and the great-toe with its ball.

A view, such as K, is generally massed as in O, but care must be taken not to fall into the error of filling all the angle on the right with toes. They should not project further into it than the dotted line. In early Gothic drawings the toes are shorn off, as it were, at an angle, as in M.

If the designer is at a loss for a model for a foot, he may take a shoe or boot which has undergone some wear, and he will find it some assistance.

Drawings of feet in stockings are useful, as they give the general shape of the foot.

The bones of the middle toes appear in the articulated skeleton projecting straight forward in continuation of the line of their metatarsals. In most cases in life, however, they are more or less flexed, bent so that their joints project upwards. One needs to know the bones of the toes just as much as those of the fingers, to which they are similar. The second and third phalanges are comparatively much shorter and wider. The first phalanx being nearly always turned upward a little, the extensor tendon on the top is evident, and becomes part of the toe-form, and the outline generally begins with the tendon. These extensor tendons attach to the base of the *second* phalanx, and thus the length of the first phalanx becomes very much diminished.

The three middle toes, therefore, present each three upper surfaces, separated by two knuckles. Very often, however, the two last joints are almost straight with one another, and so only the upper knuckle projects. This yields such forms as are used in Fig. 146, B, D, and K. The little-toe, although also of three bones, shows its construction less clearly, and very often appears as merely an ovoid mass, pebble-like, with a slight projecting nail before, and a concave tendon behind.

The smaller toes like the fingers have their pulpy ends at the outer end of the last phalanx, although the greatest depth of it is not quite at the end. In the great-toe as in the thumb the mass is driven further back, and is very much larger. The under side of the great-toe is even more heart-shaped than the under side of the thumb. As in the thumb, the first phalanx becomes a mere neck between the ball and the large mass of the second phalanx. The ball is deep, being enlarged by two sesamoid bones under the anterior end of the metatarsal.

The little-toe corresponds in two particulars to the little-fingers—it is drawn back, bent somewhat more than

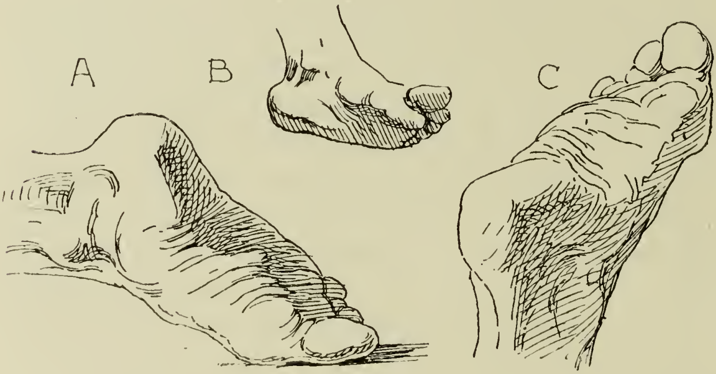

FIG. 147.

the other toes, and it is more obliquely placed; that is, it tends to show its inner border. At the side of it, as, to some extent, an extension of the fleshy mass which covers its metatarsal at the outside, is a fatty prominence, which looks like a sixth toe not yet endowed with a separate existence.

Considered together, the four smaller toes resemble the fingers in their knuckles being separated, and their tips together, and they contrast with the great-toe in making a convex mass forward, while it makes a concave.

The foot of a woman is much straighter than that of a man, and more like a hand. The great-toe is more like a thumb; that is to say, the last joint is not swollen out so much to a heart-shape as in a man's.

In sketching in the foot, it will be well to always give the smaller toes a different direction from that of the great-toe, letting the latter proceed straight forward, and the smaller toes proceed outward, as shown in Fig. 146, M.

73. General Remarks upon the Lower Limb.

A FEW words may be said epitomizing the sexual differences in the lower limb, the most remarkable peculiarities of form and movement, and the proportions.

The difference between the male and female forms is very considerable. In both the limb tapers, but in the female so much more decidedly that we may regard its form as tapering, the male as maintaining its width.

Allowing that the female limb is about three inches shorter than the male, the thigh, front view, is yet wider than the male; and the knee is also wider than the male, but the calf is less, and the foot is less. In the side view we notice that across the widest part, including *gluteus maximus*, the female is wider; at the lower extremity of the same mass, where the thigh properly begins, the female is wider; but at the middle of the thigh it is narrower; the knee is perhaps wider in the female, but the calf is again narrower; so that the upper part of the thigh is greater in woman, but the calf is greater in man. Then the tapering in the female is assisted by the greater width of knee, which equals that of the calf. This width of the knee is not produced by greater bone, for the female knee-bones are smaller than the male, but to an extra fatness of this region, coupled with that fact concerning the muscular forms of women which has been alluded to more than once. This is the shortness of the female tendons, or the creeping of the muscular fibres down the tendons. To the same cause is due the fattening of the lower part of the female, close down upon the ankle. The fatness of the female knee is evident even in the sitting figure. In the male both the knee and ankle are bony, and the

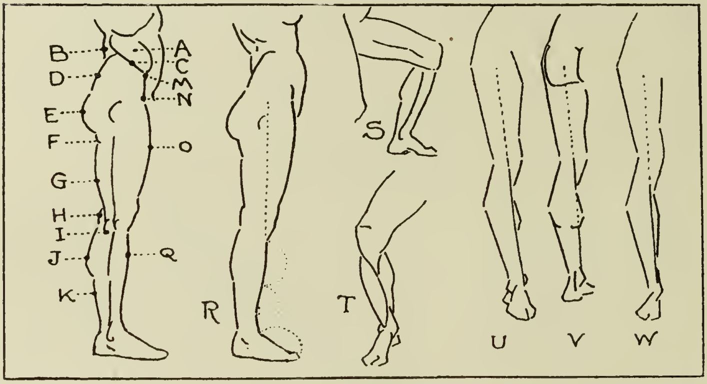

FIG. 148.

tendons more exposed and inclined to stringiness. The male knee is less in width than the calf.

The diagram here given will assist the comparison of the two sexes. The most remarkable differences are the following. The shapes of D and E and the relation between them, the length of F, and how in the female it makes an obtuse angle with G, so that in the male F and G are almost one, but distinctly separate in the female.

The back of the knee (H) must be convex in both. The calf-forms (J and K) must be more zigzag in the male, (O) more prominent in the female, and (Q) convex in both.

The creases in the limb are very useful in expressing the direction forwards towards the spectator, or backwards away from him, just as transverse stripes, like those on the stockings of football players, are. The creases below the glutei at the back, and those behind the ankle and in the sole, are in this way very helpful.

Reference has been before made to the joining by an oblique line of one part of the leg with another. The connection between the thigh and leg requires, however, another word or two. The thigh overhangs the leg ; or in other words, the leg comes from the hinder part of the thigh. One might go so far as to say that a line down the middle of the thigh will give the front outline of the leg. Compare Fig. 148, R, U, V, W, and notice how in U, which is a very frequently used view of the limb, the inner calf and ankle occur as projections upon this medial line. The rule applies less to the front view (W), but even there is of value. Note the obliquity of the knee in all these examples.

We have seen before how the thigh includes the knee. The inclusion is very palpable in the inner view (S). The connection of the upper part of the tibia and the knee with the thigh is also very important (T), the knee being spliced down into the leg. The student cannot fail to notice how in both the knee and elbow the bone projects, as it were, through the flesh, as if, fleshily speaking, the figure were always out at elbows.

The tibia is twisted upon itself, so that in the normal standing position, the heels being together, the toes are some distance apart. The feet are thus not parallel to one another, but at an angle of about 45 degrees. If the toes and heels are placed together, the thigh will be rotated inward a little.

In the seated figure the angle between the feet is much less, and the toes and heels may be together, or the toes may be even closer together than the heels, without any discomfort. This correction of the permanent out-turning of the foot is due to rotation inwards of the tibia, an action only possible when the knee is bent.

The knee-joint is a hinge of great range backward, flexion, but very slight range forward, extension. This extreme extension is best, or perhaps only seen in the standing leg of a figure standing at ease.

The ankle-joint, including the joints between the larger bones of the foot, is a hinge-joint, combined with various subtle movements, of which the most palpable are the turning inward and outward of the sole. The outer and inner borders of the foot can thus be placed upon the ground without the leg or thigh being changed in position. In stretching the legs and feet out to their greatest extent the feet tend to cross, and the soles become inverted, or turned toward one another.

The female foot is proportionally smaller than the male, after allowing for difference of stature.

The knee-joint occurs at just about the half of the length of the lower limb from the top of the head of the femur to the ground. The head of the fibula is at a quarter the height of the figure.

The top of the foot is about half the length from the front of the ankle-joint to the tubercle of the tibia, in the female (Fig. 148, R); in the male twice the foot-front may reach as high as the knee-cap.

In the female the thigh-bones are not only shorter but more obliquely placed, being separated above by a wider pelvis. The angle they make with the tibias is therefore more definite, or less than in the male.

74. The Hair.

In old drawings, when the hair is represented by lines, they nearly always follow the direction of the hairs themselves. In our own day the lines are frequently nothing more than a means of producing a tone, and the direction of the individual hairs is not expressed. What needs to be noticed in drawing the hair constructively is, that all the hairs do not keep to the locks, but stray about, and though five or six follow one even direction, they will be crossed at an angle, slight or great, by another hair, or by hairs.

In the engravings from which Fig. 16 is reproduced, the hairs are all drawn separately by double lines, and the tone is got by thickening the lines, and consequently narrowing the space between them. Great attention is paid to the stray hairs, and the effect is very good and not at all wiry. (Fig. 26 is in this manner.) The flesh in Fig. 16 is in the impressionist manner, the lines all going virtually in one direction, and thickening and thinning as the tone requires.

DRAPERY

75. Points and Surfaces of Support.

It is necessary first to fix the points of support, and these will be found to be of two kinds, principal and secondary. A principal support is one from which the

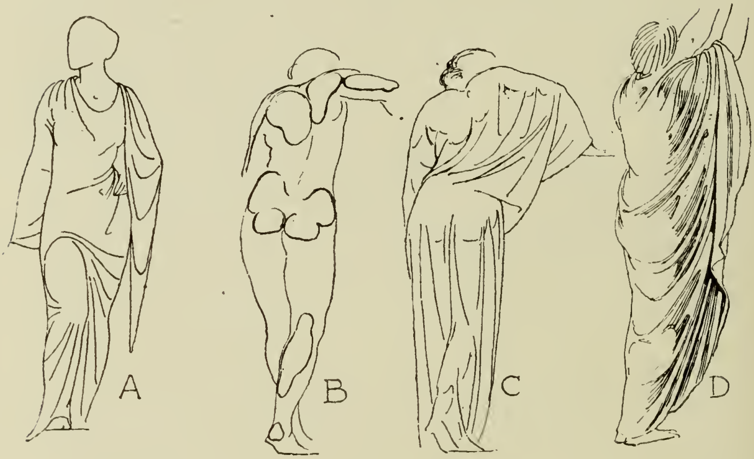

Fig. 149.—Points and Surfaces of Suspension.

drapery definitely hangs, as a shoulder; a secondary support is one produced by an eminence of the body rising so far as to push the drapery out a little.

There is reason to believe that the Gothic artists defined the areas of support by encircling them, as is done in B. Any surface which asserts itself among the drapery, whether as a primary or a secondary support, should be outlined in this way. The areas thus defined

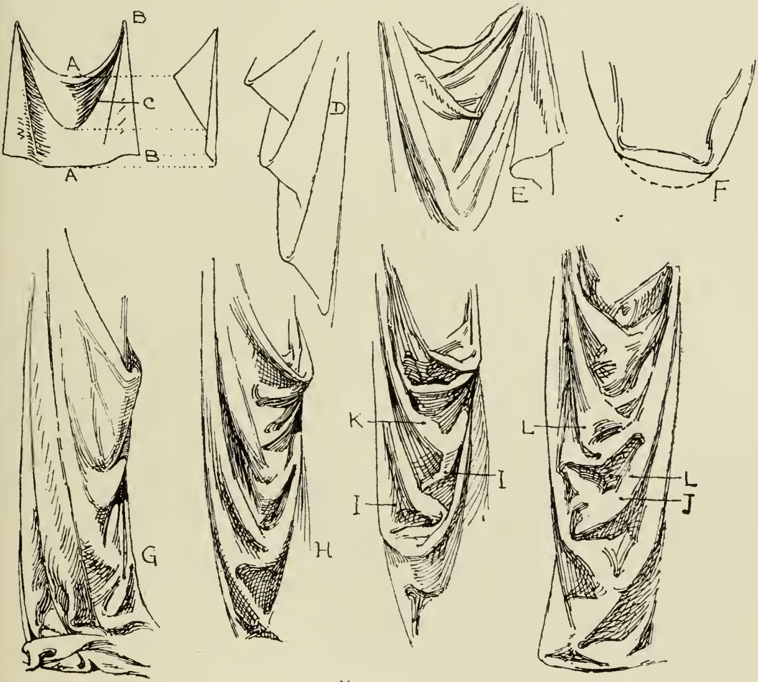

FIG. 150.

become the only parts of the figure which show; the other limbs may be thin wires for all the difference they make to the effect of the drapery.

If the drapery is drawn upward, instead of being allowed to fall, the surfaces of support will of course be on the under sides of the masses of the figure (as D, Fig. 149).

The number of the folds depends upon the method of arrangement, the kind of supports, but chiefly upon the texture of the fabric. A stiff or thick cloth will of course give broader masses, and duller and fewer folds, than a light silk or cotton.

The following details of folds must now be noted. In Fig. 150 it will be seen that the depth A A is less than the depth B B, although they are actually equal when the cloth is spread out. The weight of the festooned part compels it to fold upon itself, and so the edge (A in the example) comes forward, making a cone-like piece running backward and downward, till it meets another uplifting surface of the cloth (C). Thus there is a zigzag arrangement formed, which becomes less angular as it descends, while the folds become deeper, and more ovoid or pointed (D).

All folds, except those at the edges of the material, have an upper or concave piece, and a lower or convex piece, connected in front by a cord-like edge. The upper piece has the same bulk as the lower, but less space, and therefore is obliged to crinkle, or fold upon itself. Often this subordinate folding affects the lower part of the fold, making it also angular, as F, Fig. 150.

More frequently, instead of the folds being continuous from one point of support to the other, there are two distinct arrangements, one from each point, and the folds of one meet their opponents at an angle (E, Fig. 150), dying away as they do so, or rapidly terminating, and not ascending beneath the other folds to the contrary point. When the drapery is full, however, the opposing systems intermingle, as is illustrated in G, H, I, and J. In G is a system from the left. In H the right corner is placed higher, and the right system begins to assert itself, and to diminish the predominance of the left system of G. In I the process is carried further, till in J the right has more prominence than the left. As folds commence to come or die away, they suggest the directions which they are about to, or did formerly, take. Thus the premonitory elevations I I become the fold J, while the fold K is divided into L L.

76. The Summits or Cords of the Drapery.

MOST of the present illustrations will show that the folds have an edge, or summit, which generally receives light. In the simplest drapery of all, the folds radiate like cords from the points of suspension, and die away upon the masses of the figure. Between the cords the

FIG. 151.

surface sinks down into more or less of a concavity, and can be represented by shading (as in Fig. 149, D).

There will, however, generally be more cords on the broad part of the figure than at the termination of the folds on the point of support. What is one fold there, will divide into two or three as it descends, because it is pushed up by a secondary support. They may be

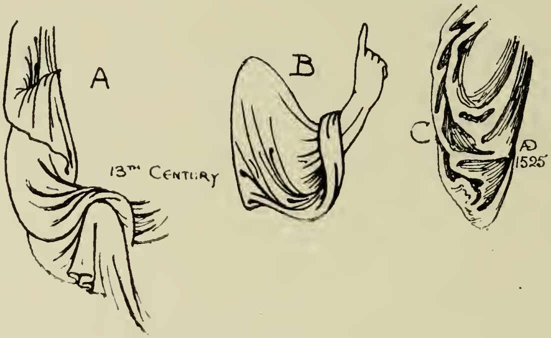

FIG. 152.

A and B from thirteenth-century stained glass, C from an early sixteenth-century manuscript in the British Museum.

managed thus: Let the two lines in, say, a pen-drawing, representing the two sides of a cord, diverge as they

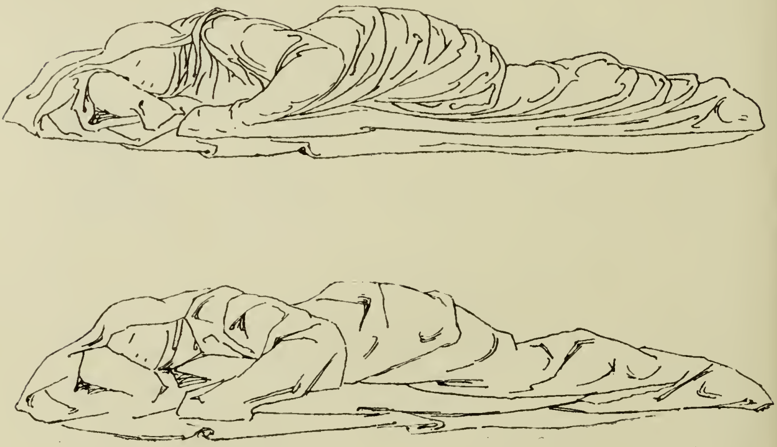

FIG. 153.

descend. (Fig. 151, A A.) Indeed, the drapery will look very poor if they do not.

Then each line may be considered as the outer side of two cords, which unite as they converge (A). In old glass-paintings this is generally represented as at B. Or instead of keeping the added lines parallel (as in A and B), they may diverge, as did the original pair, thus making room for others between them (as in C). And the process may go on still further (as in D). In E the loops are exaggerated, as in the drawings of Lucas Cranach and Albert Dürer. Dürer's drapery should be studied carefully, mannered as it is. It is very strong, full of modelling, and has the details always carefully worked out. The drapery takes the form of cords when it is drawn closely upon the body, so that it cannot fall into large masses, the broad surfaces between the cords being produced by the masses of the figure. (Fig. 154, B.)

When the drapery departs from the cord-like, and expands into surfaces, the summits are the edges of the surfaces. In Fig. 153 the two kinds may be compared.

77. Various Kinds of Drapery.

THE form of the fold, and the general character of the drapery, will depend upon the kind of material used, the system on which it is made up into garments, and the length of time they are worn. All these matters must be studied in the drapery itself, and it is idle to attempt explanations of them.

But, although one hesitates to say so, there is a designer's drapery based upon laws which every one must admit are true, but which are inadequate to the production of the complex forms of nature. All designers will frankly admit this, but will have a sufficient excuse.

Every one who is at all acquainted with the history of Art knows that only occasionally do we meet with absolutely real drapery in old work. We might almost say that whenever the form or character of the drapery reveals the hand of a particular master, or the style of a particular period, it must be to some extent conventional. And this is only what we might expect when we consider that almost always the old masters were hotly pursuing some idea, the expression of which, and not mere likeness of detail, was the aim and end of their labour.

It may be that the draperies of the early periods I am about to mention were portraits of the actual clothing of the time; they certainly were to a great extent, but when the question of detailed form arises it would be difficult to deny that the method employed was mere portraiture.

The costumes of those early periods were favourable to the study of the laws of drapery, and we shall see, in the briefest possible survey of the successive styles, the growing complexity of costume accompanied by closer research into the laws themselves.

In the Greek vase paintings the drapery is generally represented by lines radiating from the points of support, sometimes hanging festoon-like, sometimes approaching one another from opposite systems, and terminating in hooks. On the female figures two kinds of material are generally expressed, one having long folds, few in number and represented by single lines, rather pure in curve, another having many folds represented by irregularly waved lines more parallel in direction. The outlines of the figure are rarely disturbed by the folds which pass round them. The folds often make angles with the outlines, and there is no attempt to keep them tangential to them.

The next style is that exhibited in the ivories and manuscripts from say 300 to 700 A.D. It retains the pipe-like character of the ancient Roman, but the surfaces receding from the pipes or cords to the figure are neglected, and if the body shows at all, it appears as too rounded, with the cords of drapery stretched closely upon it.

Fig. 154.

From about 700 A.D. the folds become less curved, and are frequently very straight (Fig. 180, 1); festoon folds become V-shaped; and only rarely, if ever, are the lines broken. But the outlines of the figure are often disturbed, or crossed by folds passing round them.

In the twelfth and thirteenth centuries these simple styles are carried to perfection. In sculpture the receding surfaces could not be overlooked and were necessarily developed. But the style remains essentially simple, the festoon lines are either curves of considerable purity, or are V-shaped. (Figs. 1 and 150.) If one may so speak, this dignified and unworldly kind of drapery has been used by Sir E. Burne-Jones in his noble and beautiful 'Dies Domini' and 'Resurrection.'

The fourteenth century brings us the angular fold and greater attention to the receding flanks. The development

FIG. 155.

continued to the end of the Gothic period, Dürer being one of the last masters of the style. His drapery is, however, more angular than a great deal of that produced at or before his time—particularly in sculpture.

In the Renaissance period, angularity survives in the drapery of Mantegna, whose style seems to be somewhat followed in Sir E. Burne-Jones's 'Wheel of Fortune.' We will only notice, however, one or two of the more remarkable styles, as we must bring this survey to a close.

The followers of Raphael developed a pipe-like style, which, if not abused, is very serviceable. Pipes or cords of drapery radiate from the points of support and clasp the figure, reducing the receding surfaces to a minimum, and exposing the figure between them as if the material were damp, and consequently clung to the form. Fig. 154, B is designed in this manner. The most typical examples are to be found on Urbino plates or Marc-

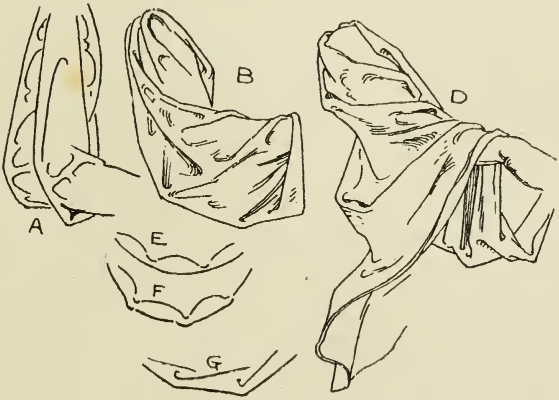

FIG. 156.

Antonio's engravings. The chief faults as a rule are—an insipid simplicity in the curvature of the "pipes," or, shall we say, india-rubber tubes, an absence of real form in the loops, and the apparent dampness of the material. Nevertheless it is a good style to commence the study of form and fold in, and need not necessarily have the faults named. Some of Mr. Walter Crane's designs are in a style very similar.

The last style, or peculiarity, we shall name is that which may be dated perhaps from Titian. It is about his time that drapery begins to be represented *for its own sake;*

hitherto it had been merely an adjunct to the figure. The laws we have been examining require a figure or something to hold the drapery up, or a breeze to carry it out into the air, but now, although it is supported or blown out, and perforce must take certain forms, it yet has itself something to do in the making of folds. Throw a piece of drapery down upon the floor and it will take folds itself, it will provide points of support for itself, and in great numbers too. And to get rid of these folds inherent in the nature of drapery, we have to weight it by damping, or assume it blown by very violent gusts of wind. When the drapery is not thus simplified the lines of the large folds shake or wave irregularly; and there are transverse creases or suggestions of such, from fold to fold. Then if any light is expressed on the folds it will not pass regularly down the pipe, but will zigzag in an irregular manner from side to side. These suggestions are all of value, but they must not be carried too far, as they elucidate nothing but the drapery. Fig. 155 is also in this manner. It reached its lowest depth of tawdry exaggeration about 1750. The Le Brun, Fig. 176, falls within its grasp. Fig. 156 will perhaps explain itself.

COMPOSITION

78. The Function of Composition.

There are two kinds of composition, that which is *explanatory*, and that which is *æsthetic*. By the former the parts of the design are so arranged as to sufficiently or emphatically reveal the subject, and interpret the scene represented; by the latter they are rendered more pleasing to the eye.

The principles of æsthetic composition are well known—Order, Unity, Symmetry, Simplicity, Proportion, Variety, Gradation, Subordination, Contrast, Volume, Restraint. Almost any one could illustrate these, and few will doubt their value. We shall not enter into a consideration of them here, a masterly analysis of some of the more important will be found in Ruskin's *Modern Painters*, vol. ii., and what few remarks we shall have to make upon them will be introduced into the succeeding paragraphs where opportunity serves.

There is some composition in all art; there must be some, even in the most natural, because the drawing must fit a space. Sometimes the composition is arranged by Nature, and in that case one has only to take what is given; but it is usually not so, and the artist must then compose his work himself. In the case of natural composition, the artist has to select his point of view, and one of the numerous momentary groupings which present themselves, and is thus himself responsible.

There are other reasons for composition than that of making the subject fit a given space, for in a picture the space rather fits the subject than otherwise. In decorative art the artist is bound to a certain space. But the chief function of composition is to place the subject properly before the spectator, so that his attention is not held by some unimportant point, and the real subject missed. This concentration of attention on the main feature of the work is the *only* reason for employing composition, when ornamental or decorative effect is not also sought after.

In decorative art the matter is different. The composition must be a beautiful pattern as well as a clear exposition of the subject.

The laws of composition are based upon the following facts—

The proneness of the eye to connect similar things, and to pass from one to another. The Simplicity and Unity produced by similarity. The habit of the eye to follow the course of lines. The laws of physical stability, yielding the upright and horizontal lines and the triangle; and also the law of equal lateral expansion, resulting in symmetry, balance, and equilibrium. The inability of the eye to pass across lines, especially if doubled, or further multiplied. The fact of similarity of appearance denoting similarity of conditions.

79. The Single Figure in a Space.

IF the figure is large, and occupies a considerable portion of the space, its lines must be carefully considered in relation to the border-lines, for these will force themselves upon the attention. If the figure is small, and occupies only the middle of the panel, the border-lines being distant

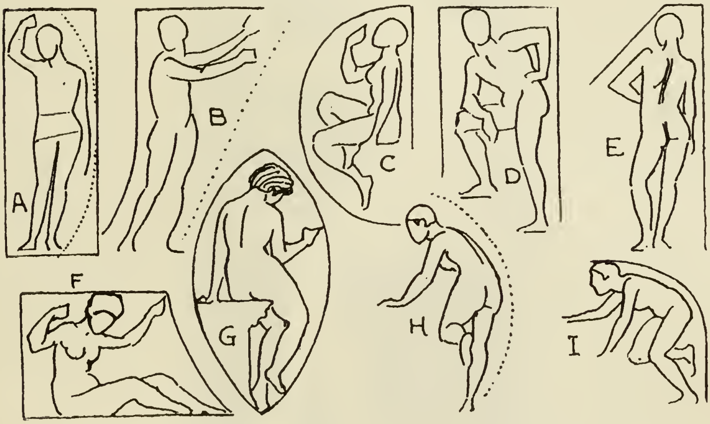

FIG. 157.—Attitudes from Nature surrounded by suitable shapes.

will not interfere, and in all probability some lines of background will occur between them and the figure, which will establish some sort of harmony, even if it were originally lacking.

Some spaces are particularly difficult to fill with large single figures, a square being very unaccommodating. The danger of the design showing that the figure has been tortured into a position, should of itself deter one from placing much importance on the solution of these problems, for the human figure is the last thing that should be conventionalized, or *turned to agree with* conditions. If it is known that the figures will be required to closely fill their spaces, the awkward shapes may be avoided in planning, or circles may be placed in the squares, and ovals or vesicæ piscis in oblongs.

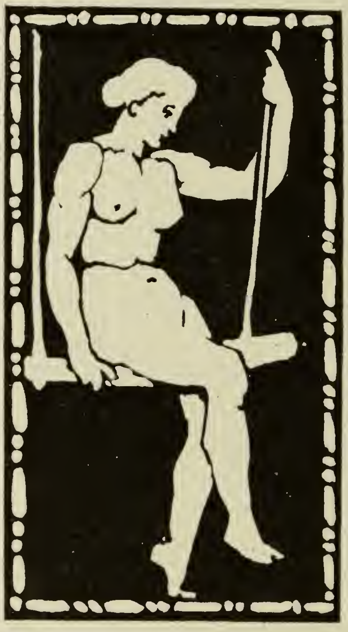

Fig. 158.

The figure must at all costs be saved from degradation to the level of acanthus foliage. Many attitudes, however, yield mass-lines which correspond to frequently-used panel shapes. Care must be taken that the head is never so placed as to appear as if purposely held down by its owner to avoid bumping against the border. It is better for the head to be directed toward the border, as in E, than to risk producing a ludicrous attitude.

Should the figure be turned to the right or left, there should be more space on the side to which it is directed (Fig. 158). If the figure is required to be in the middle of the panel, and the body directed toward one side, the head may be turned to the other side. This balances the composition, and renders the action of the figure symmetrical. Similarly the central figure of a group will generally have the body directed to one side, the head to the other.

In decorative composition the figure should be placed centrally if possible, and extend equally in the four directions, so that if it touches the bottom line it will also touch the top and sides. There should not be more space above than below, as is the case in pictures, though some picture-painters contrive, by flights of steps, &c., to lift their figures high on the canvas.

The figure will most decoratively fill the space if its mass-line be symmetrical, as in G, Fig. 157.

80. Grouping.

A GROUP is formed when two or more figures are so near together as to become a mass in the composition.

Generally the figures are engaged in common action, because it is common action that brings people together into groups. Isolated groups are usually somewhat symmetrical in outline, but very rarely indeed is the symmetry emphasized. Such a form as that in Fig. 160 is not infrequent in large compositions, the broader end abutting against the border, but it would be a subordinate group. And if used in an isolated manner it would require some object of importance placed where the cross is in the diagram to balance the composition.

The shape of a group will be determined by various circumstances incidental to the action of the figures, but the most generally used are the triangular (Fig. 159), the vertical and horizontal ovals (Figs. 161 and 169), the pear-shaped, and the pentagonal. These forms are in accordance with the laws of stability, and the rule that the most important part is generally at the top—a rule which implies subordination. Symmetry will exist where there is equality of action.

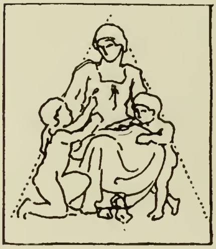

Fig. 159.

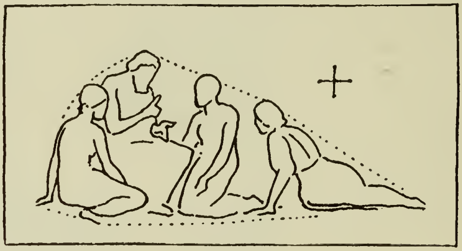

Fig. 160.

Within the group the lines of the figures will fall into a harmonious arrangement radiating tangentially with one another, or from the chief points of interest in the group (Fig. 162). The result is a linear dance from point to point, including and embracing all the figures. This harmonious relation of line to line is best secured by working at the same time upon all those which we think should be connected. The hand being as it were full of a curve it has just drawn, will carry some of it into the next line, and so the unity of the whole will be established.

Parallelism is a means of producing harmony, but also of mimicry, and consequently we rarely if ever see it among the lines of a group, or of a whole composition. Exception must, however, be made in favour of the vertical and horizontal lines, which have an architectural significance, and add to the stability of the design.

Lines to be radiating need not necessarily be traced right to a point of contact, as sometimes they become parallel and would never meet. But it is not necessary that either this region of parallelism or the point of contact should be within the design. The eye will be drawn

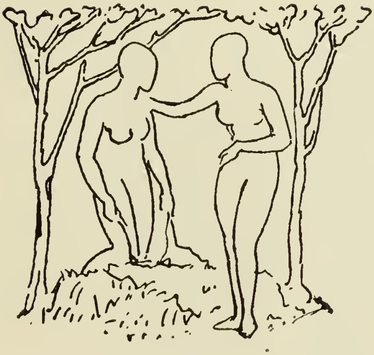

FIG. 161.

FIG. 162.

toward the conclusion of the system, but the attention may be turned by a line crossing it. Sometimes, if the lines radiate upwards, the line of heads at the top of the group is sufficient, by reason of the greater interest of the heads, to gather in the converging lines; but if not, a line, or lines, must be contrived in the accessories, as by the tree in Fig. 163. The gathering line may be curved, or it may not, but care must be taken that it leads the eye in the right direction, not out of the design, but back to some leading part of it. The drapery which in some styles is fluttered over the head is a kind of gathering line as well as a "halo" around the head (Fig. 164).

The more the figures are to be combined in one action, the more constantly should the lines of one lead to the lines of another, and back again. But if one figure of the group is in any way separated in thought or action from the others, the lines of that one should tend to return upon themselves, or to diverge into the other parts of the design. This separation will be produced by not drawing the figure

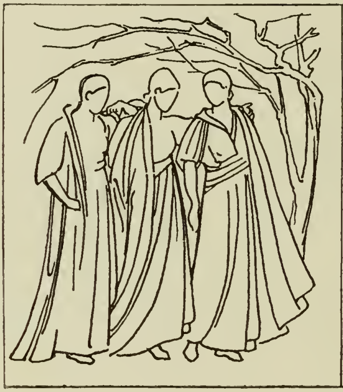

FIG. 163.

FIG. 164.

at the same time as the others, and only occasionally allowing the pencil to wander from it to them.

The ground-plan of a group must be carefully considered. There will generally be a focus, or centre, to the group, as in Fig. 160, where the focus is the old man, and the middle line of the group runs to the outstretched feet of the figure on our right. The chief figure is usually at or near the edge of the group, but facing inwards in a direction which divides the group equally ; for the various persons assembled will all wish to be within a certain distance of the centre of interest. The chief person will be directed toward the middle line, equally, that is, to all the other members. This is supposing that the action is still proceeding, but if it is about to terminate, the arrangement will become somewhat scattered. If the chief person be directed more toward one side of the group, the persons on the other side must either express some impatience, or must exhibit less interest. Those on the skirts of the group may be talking among themselves, or apparently preparing to depart (Fig. 165).

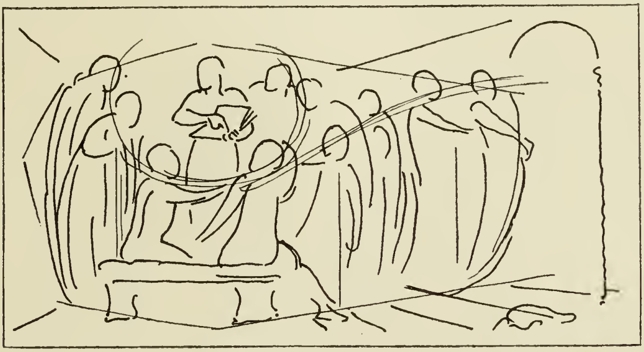

FIG. 165.

(In this design we see the head of the chief figure encircled by an oval of heads, from which tangentially another line through the heads of the figures on the right leads toward the doorway. The progress outward of the eye is arrested by the arch and jamb and thrown to the floor, where it reaches the radiating lines of the floor, and so is brought back to the group. The lines here given for the figures are merely propositions. If the figures conform somewhat to them it will be sufficient. Several vertical lines are similarly introduced, and lines are also brought from the corners.)

A view taken in line with the centre of the group will give us the chief figure in the middle, and the other members equally arranged on either side; a view taken at right angles to the middle line will give the chief figure almost at the right or left extreme. In Raphael's cartoon of 'The Charge to Peter,' Christ is becoming separated from the group. He is at the extreme left, the figures at the extreme right show less interest than those in the middle. It is in every way a masterly composition, and we feel that in a moment the separation will be complete, and that the composition will assume that form so ably used by Mr. Orchardson, wherein one important figure on one side is balanced against a group of less important ones on the other.

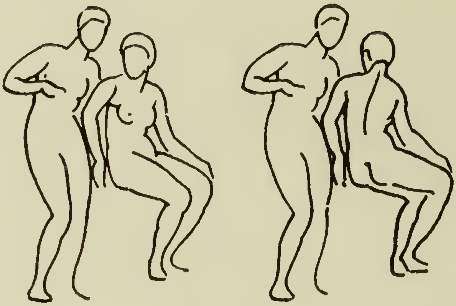

FIG. 166.

To keep the interest within a group, the outer figures may present the same curve or line on either side; thus two figures may be both seated, one on each side of and facing the centre of the group, and providing by their bent backs symmetrical curves. This is in accordance with the principle of vortex composition, as described on page 275.

The designer must not allow himself any lines, to bind the different parts of his design together, beyond what can be provided by the furniture, architecture, or any kind of detail which is suitable to the subject. Curls of smoke and the "mystic swirl" are very useful, but the facility with which they can be handled, and their value as connecting lines are apt to lead the designer to use them too frequently and so fall into mannerism. In decorative art some excuse could be found, but an endeavour should be made to do without them.

Fig. 166 illustrates the fact that the front and back view of an attitude have the same outline. Generally one finds oneself drawing all the figures in front view, but any of them may be turned round with very little trouble.

81. Emphasizing Particular Figures.

The following are different methods of emphasizing portions of compositions:—by lines, whether of architecture, pavement, furniture, spears, or any long definite

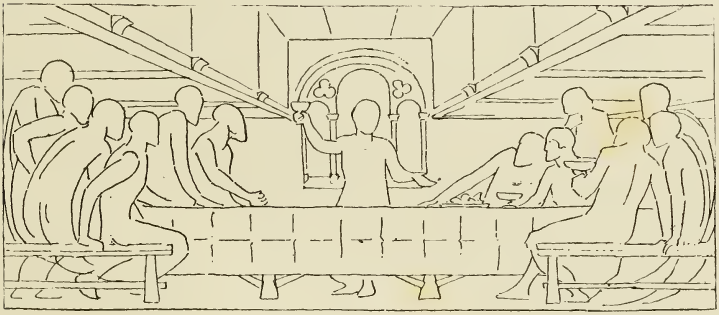

Fig. 167.

lines pointing toward the object, as do the architectural lines to the head of the Christ in the 'Last Supper.' (Fig. 167.)

When one has to give a feeling of solitude, the lines of the composition may lead the eye to, or near, some unimportant object which stands out with considerable prominence, and near the chief point of interest. This is in accordance with the fact that when one enters a room in which a person is engaged in any solitary occupation, one rarely sees that person immediately upon one's entrance. Often some trifling detail will attract attention first. This management of the effect of solitude is to be seen in Dürer's print of St. Jerome in his cell.

Emphasis may also be obtained by circles round a figure, or head of a figure, as a halo round the head of a saint, and by any other way of *framing* a portion. Sometimes

FIG. 168.

the frame of a door or window will serve, or a patch of dark or light; anything that will cage the eye in, and compel it to dwell upon what is within. By any of these means it will be found possible to give special prominence to any figure of a group, which it may be desirable to specialize.

In illustration of this emphasis, Fig. 168 may be referred to. It is supposed to represent a place of public resort, where people of all temperaments and positions will be engaged in all manner of conversation. Let it be supposed that to this place one character in a story brings another. These two persons will be to the ordinary

FIG. 169.—The Adoration of the Shepherds. (From an old etching.)

spectator, possibly of far less interest than many of the other people present. The artist will have to express the importance to the crowd of these other people, while the attention of those who see the picture must be drawn to the two strangers, who would be of considerable concern to a reader of the supposed story. This is to be done by radiating lines from these strangers, and arching them over, as is shown in the diagram. In this example all the figures were drawn without any idea as to which figures should be emphasized, and the whole of the architectural background was added, to solve the problem, when it had been determined which were apparently of *least* importance, that *they* may become the centre of interest. Any one of the figures may be similarly emphasized by manipulating the background.

Further, a form may be emphasized by repeating on either side of it, the same or similar forms, a blot of tone, or a pose reversed.

Again, when the figures of a composition are looking at an object, the fact naturally calls attention to that object. If it happen that the object is comparatively unimportant, the composition must be strengthened in other ways to prevent the interest being concentrated too much on that object.

In Fig. 169 let the following details of composition be noted. The way in which the heads of the shepherds and others form an oval around the Virgin's head. She is evidently the centre of the composition, although the figures are most of them looking at the child. All the lines concentrate at the Virgin's face however, the slanting beam or ladder, the arch, the arm of the figure with the long staff, the right arm and head of the nearest figures on the left, and the stick on the ground leading up by the Virgin's thigh and back—to mention no more. The vertical lines of the architecture and tree must not be overlooked. Strange as is the drawing, it well repays study.

Yet another method of emphasizing or calling attention to a part of the subject is that of including it in an important line of the composition. In the 'Adoration' above one is sure to follow the oval made by the heads, and this oval line includes the head of the Christ-child, upon which the attention may be kept. Only on His head and on that of the Virgin can this be done; from all the others one is led away, partially it will be seen by the proximity of other heads which force themselves upon one's notice.

82. Filling of Spaces. Two methods of the last century.

Ornamentally considered, the composition of line in a figure subject is based very much on the same principles as an ordinary piece of ornament. Where all the figures are combined in one action, the composition should certainly follow some definite plan, and according as the interest is concentrated, so will the lines of the composition return again and again into one another. As in ornamental design, the composition may be likened to a dance, since the eye is led gracefully from point to point.

Figure designs may be classified according to the number of separate points of interest they contain; that is to say, where it consists only of two or three figures engaged in one action, the lines of these figures will arrange themselves in what might be called, if curved lines are used, a vortex. That is, the lines lead round and round the figures, and in and among them, but do not stray beyond the group. Perhaps the simplest kind of composition, or adaptation of figures to a space, is that which was so much used in, and became typical of the last century. It was simply the employment of what has been called a vortex within a rectangle. These vortices may be roughly regarded as of two kinds. There are those in which the figures form such a shape as an oval, within which almost all the lines are kept, as in Fig. 170. Perhaps the most beautiful example of this style of composition in recent art, is the 'Diana and Endymion' of Mr. G. F. Watts. The figure of Diana occupies the upper half, floating above a figure of Endymion, and stooping to kiss him. A piece of drapery encloses in a half oval the figure of Diana, and concludes the composition at the top. The under half is similarly treated. There thus occur vacancies at the corners, and it is these which are so characteristic of the style of the last century. In fact it will be found, that in those styles the figures or ornament were generally placed in the middle and at the corners of the rectangles. This is well exemplified in the picture-frames of that period. The reader must surely have noticed the old-fashioned frame with its ornamental corners; these are only suitable, and are then really so, to enclose oval compositions. The central mass was usually oval in an oblong, or round in a square. The value of drapery as a means of making these ovals or circles, is illustrated in the picture by Mr. G. F. Watts before alluded to, in which example it is appropriate. But it has been, and continually is, constantly used where no reason can be

FIG. 170.

given why any drapery should be fluttering about at all. It seems, indeed, as if in this style of composition the persons were continually living amid gusts of wind.

The other kind of vortex composition is that in which

FIG. 171.

the limbs of the figure spread out in a star-like manner, as in Fig. 171. It may be said that these are also oval or circular designs, the limbs being arranged at right angles to the circumference. Both of the kinds of composition which have been mentioned here, were largely employed in the last century for the centres of otherwise plain panels, for which they are remarkably suitable; thus the background of Fig. 171 may be all one flat colour. The star-like arrangement is perhaps best when the panel is large, and the group is to occupy only a small portion of it; the more confined system when it is to occupy most of the panel.

83. Filling of Spaces. Another or Later System.

THE systems spoken of in the last paragraph were by no means limited to the last century. In fact, somewhat similar arrangements have been used in all the old styles. The number of examples in our National Gallery is very large, and it was rarely that an old master adopted a system which was very different. The larger the number of figures, the more expanded the group becomes, but it can generally be surrounded by a curved line. Only in a few instances, in the Italian School, has the composition been based upon the rectangle, the most noticeable examples being Michael Angelo's 'Madonna,' and his pupil Bronzino's 'Folly.' In the latter picture, the arm of 'Time' seems to have been purposely placed parallel to the upper border, to which also it is very near. But a rectangular method is employed in works of to-day, which seem to have no very distinct parallel in old work. It is that in which lines of the architecture, furniture, and such subordinate matters, and not of the figures as in Bronzino's picture, are kept more or less parallel to the lines of the frame, and which seem therefore to run out of the picture. There is one advantage in this method, over those which tend to centralization, which is, that they suggest that the view exposed is only a part of a very much larger whole, and in this matter the systems spoken of in the last paragraph are seen to have a contrary effect. In pictures based upon those systems, it appears as though there was nothing else in the universe beside the two or three figures which make up the composition, as in Fig. 171. It seems then that according as the artist wishes to express the personalities only of the figures he is representing, the method

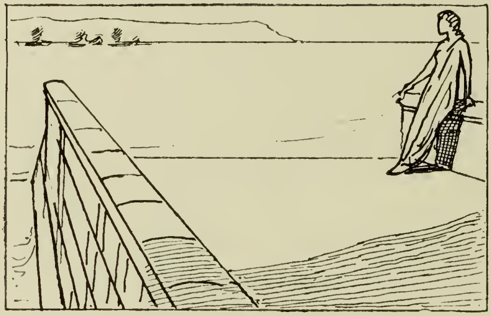

FIG. 172.

of the last century is particularly suitable; but where no particular person is of special interest, the more modern principle is the more suitable. It is perhaps only in our own day that artists have engaged themselves in such subjects as groups of figures in public places. In the numerous ephemeral illustrations with which we are now deluged, such subjects are very frequent, and what has to be noticed particularly about them is that while they represent a number of persons, often on a large scale, no particular interest attaches to any one of them, and the next group which may happen to appear will be equally interesting with that which is at present visible; indeed, the artist's aim is to give one the idea of a succession of people, all slightly interesting. The same is attempted in Fig. 183, 2, where there are a number of figures collectively more or less interesting, and individually ignored. There are many more of them beside those shown. The cutting off of a figure half-way is, of course, the most transparent method of achieving this result.

Of the modern rectangular method no finer examples could be found than the compositions of Mr. Alma Tadema.

Fig. 172 is introduced as illustrating this modern method.

84. The Figure in Decoration.

THE difference between the art of the galleries and that which is decorative, lies in the fact that in the former the artist or sculptor ignores, or forgets, the material he is painting or carving in and upon, and takes no heed of surroundings, while the decorator respects or remembers all these things. But only the extremes of both stand definitely distinguished from one another. Here is a figure incised in sheet copper, and boldly pinned to an oak chest; there is a canvas which deceives us again and again, and which demands such isolation, that we regret it must have a frame.

Between these are an array of works differing only in the subtlest manner.

The picture painters can never get the absolute isolation they long for, and so must conventionalize their works to the extent demanded by the surroundings. In fact, the whole matter turns upon *isolation*. That the picture must have, and so far as it can get it, it may retain its pictorial character, and so far as it loses it, it must conform to decorative rules.

A movable and usable thing can never be, or provide, a field for pictorial art, because one cannot depend upon its isolation, nor isolate it without at the same time dis-

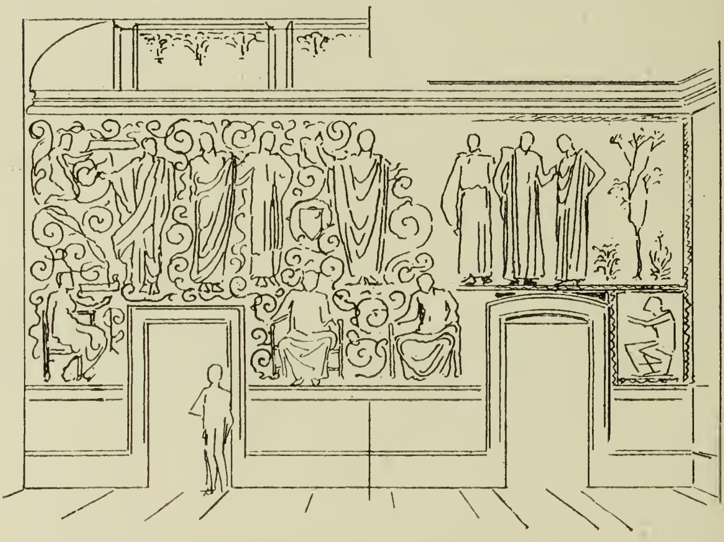

FIG. 173.—Wall decoration in the Byzantine manner.

regarding its functions of utility. Show vases, and all such "objects of art," are monstrous, being monuments to the insincerity and corrupt taste of their producers, and to the vanity and pride of their possessors.

The only common ground upon which the two arts can meet will be *fixed surfaces*. And the degree of convention necessary will be determined by the kind of isolation provided.

The Byzantine method of decoration may be defined as by a vesture. They clothed their works in so much pattern. Mosaics and marble-facings were the chief means adopted, and they spread the thin marble or gorgeous mosaics over the surface of their walls.

Although they did use subdivisions drawn upon the walls, as in the right side of Fig. 173, I have preferred to regard as the Byzantine manner that in which there are no divisions. There being no divisions there is no isolation, and therefore in the left side I have followed the most decorative of methods. That is, there is little or no ground for the figures to stand upon, for decoratively this is not necessary, and may be omitted. Compare the Pompeian wall decoration, where a figure is often seen in the middle of a large panel without any ground. They are generally dancing figures; where they are standing, they should have a slight suggestion of ground. On Greek vases figures are often painted above one another, the ground represented by a wavy line only.

The figures in Fig. 173 stand upon the scroll-work which occupies the spaces between them. Those over the door must not stand on the door, nor the sitting ones on the dado, or the non-standing principle will be destroyed; a little scroll-work should run beneath them. The scroll-work may have leafage derived from nature, but natural growth would be less suitable than spirals, which have no expression of gravitation, but affix themselves to the wall by their whole length.

The figures in this design would need to be flatly treated, outlined in all probability. And as affecting figures which are allowed but little ground, we may notice that quite vertical drapery, as on the right side, tends to enforce the action of standing and demands a ground-line, and therefore the gravitation is less expressed by such drapery as that of the central figure, for those folds carry the eye up as well as down.

The left side of Fig. 174 illustrates another style, that of the middle Renaissance ending about 1680. The wall is divided by architectural members of great weight, and the result is that the panels between are as completely isolated as they can be in a decorative scheme. Hence

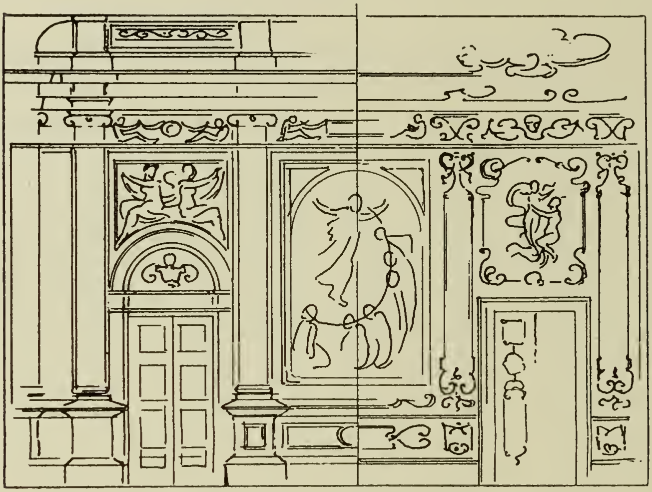

FIG. 174.—Wall decoration in Palladian and Louis XV. styles.

they may be treated more or less pictorially, that over the doorway less perhaps.

The example on the right is in the style Louis Quinze, a style remarkable for its licence, and for the true understanding of the principles of decoration which it exhibits. The heavy columns and cornices of the earlier period were the introduction of thoughtless and vain pedantry. Properly features of an extinct external architecture, they are altogether out of place as internal decoration, but the pedantry of Louis XIV. gave them a long lease of life. The gay court of the Regency and of Louis XV. cared as little for orders as for order, and, bent upon enjoying itself, managed to create a style which, while licentious and tawdry in the extreme, had yet decorative fitness as far as those base qualities would let it. The capital and column become—not even a pilaster—merely so much pattern, in relief. The cornice becomes rounded into the ceiling with which it is united by a fantastic border. A looseness and airiness pervades the whole, the decoration becoming spots connected by thin lines. The figures have little or no background, or ground, and so are coming back to the Byzantine method.

If dividing lines are needed they may be of an architectural character, but need not be imitations of construction as if the wall were built as shown. They should be done as in the old manuscripts. If merely framing lines are required they need not join exactly together, but may be of any character so long only as they provide the necessary partitions, and are recognized as decoration on the wall and not architectural features. Compare the Roman stuccoes. For lines based on architecture but not imitating it, study twelfth-century work, and Pompeian.

Decoration may be said to be based on two systems, the one of breaking up the surface into harmonious portions, and thus enriching it, and the other of applying a representation of an object to the surface to be decorated. The chess-board is typical of the first system, and a figure in the centre of a large panel, of the second.

In obedience to the former system of decoration, many historic designs have the whole field covered with forms.

(Fig. 175.) The best examples of this are perhaps the old Flemish tapestries.

Compact filling gives a good decorative effect. Care

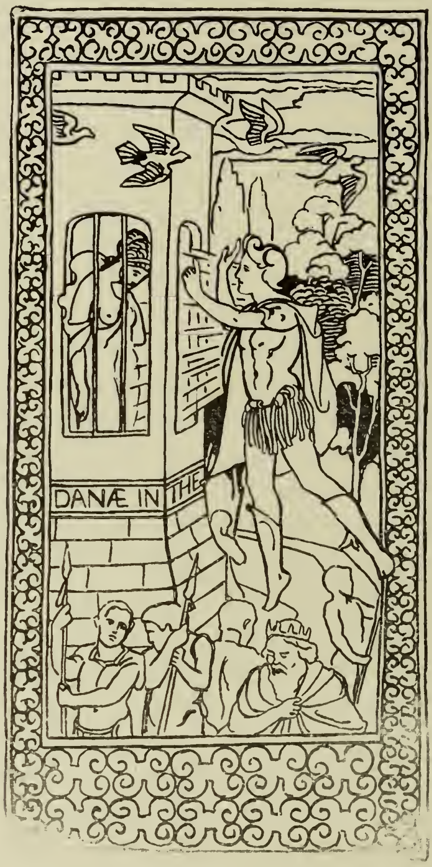

FIG. 175.—(All the field covered with forms.)

must be taken, however, not to depart from the probable in order to achieve this result; one sometimes sees designs in which a person's hair is fluttered away from the head to exactly fill a neighbouring space. Where this can reasonably be done, it improves the decorative effect.

The most conventional designs of this class are those in which figures occur at regular intervals, with, possibly, trees between them, more or less rigidly arranged. For

FIG. 176.—(The whole composition ornamentally arranged. The vase, table, and curtain introduced merely to cover the field. The hiding of the figure in the wall by the curtain is bad.) (By Charles Le Brun.)

filling the sky, clouds and birds are very valuable, while the foreground may be occupied by renderings of flowering plants and shrubs, all with sufficient space to fully show themselves, and hiding none behind them, as if indeed they fitted together like a child's puzzle. Many beautiful designs in this manner have been produced by Mr. William Morris and Sir E. Burne-Jones.

In figure-work, possibly, another case of the chess-board arrangement is the Arabesque, in which the surface is covered with scrolls, which are developed in places into representations of natural or artificial objects. In this kind of work figures have been introduced, especially in the Renaissance period; and it is a very common thing indeed to have what is called a half figure, commencing and providing the root for a scroll of foliage. In the decoration by Giulio Romano and the Zuccati, figures have their arms growing into ornament as well as their legs, and appear in all manner of such-like monstrous conditions. It should, however, be accepted as a law by the designer, that he is never to draw a figure without endowing it with a personality; he must never allow himself to use a figure merely for its shape. Such a law as this is not likely to be readily acquiesced in, since nothing is easier than to employ a figure in the semi-monstrous manner indicated. There is, however, no other way of keeping one's art instincts high and pure. It is inconceivable that an artist with high poetic power could bring himself to empty a figure of all its individuality, for the sake of its employment as a mere shape. And it will be found that those who have monstrously handled the figure, have either been thoughtless, or have indulged a not altogether beneficial fancy. It will be found that in the purest styles the figure has rarely been thus degraded. It is important however to distinguish between a representation of a monster, in its real light of monster, and a manipulation of the figure for supposed ornamental reasons, resulting in the semi-monstrous. The Babylonians believed that the creation of the world was not so much a commencement of all things, as a putting straight. Before, chaos had only bred monstrous combinations; parts of men, beasts, birds, and fishes were joined together; but at the Creation each animal took only his proper parts, and thus harmony was restored. They had a distinct belief in the survival of many of these horrible combinations, and their legends have spread them throughout Europe. There was, therefore, nothing reprehensible in representing such things, when they were held to exist, or to have existed; but

FIG. 177.

when people assume a great degree of knowledge and profess a clear understanding of things, it can only be a degraded and vitiated taste, or an exuberant, quite dispensable, fancy, that can find nothing better to dwell upon. It is sometimes said that the half figure—the figure ending in foliage—is employed when there is not sufficient height for a full figure of proper proportion with the ornament, and that some means of enlarging it is necessary. The Gothic artists and those of the early Renaissance boldly cut the figure off in such cases, and did not attempt to make it grow into foliage (Fig. 177). They had always more respect both for the figure and humanity. The defenders of the half foliated figure endeavour to gain recognition for this monster, by pointing out that the winged human beings are equally monsters. They are probably also of equal Babylonian origin, and as monstrous as the rest, but then they are monsters which we are more nearly disposed to believe in, than semi-vegetable personages.

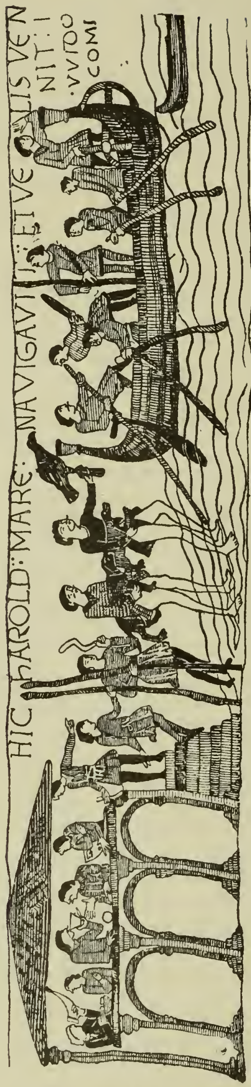

Fig. 178.—The Embarkation of Harold. From the Bayeux Tapestry.

85. Some General Principles of Decorative Composition.

What is said of decorative composition, will be found to apply, to some extent, also to pictorial composition.

There are decorative pictures as well as gallery pictures, and they have to conform to decorative principles. The composition of their lines to suit the space is one method employed in doing this. Another is, that they shall respond to the flatness of surface, by limiting their perspective, and thus they come into line with the early Mosaic decorations. The most decorative arrangement of the figures will therefore be the processional (Figs. 178 and 179). By keeping the figures on one plane, harmony is established with the surface decorated, whether it be a wall, a page of a book, or the side of an object. In this connection it is interesting to see how the foreground is dealt with. Fig. 180 gives the outline of the figure of St. Luke from the mosaics at Ravenna. It will be noticed

FIG. 179.

that both above and below him—before and behind—the ground is composed of steps of rock. This was the means generally employed by the old masters for throwing the foreground back, and bringing the background forward, so that the near and distant figures approximate in size to those in the middle, for otherwise the foreground becomes inconveniently large, and the background inconveniently small. This is simply another way of bringing the whole subject into the plane of the picture. These steps of rock have been frequently employed by Sir E. Burne-Jones, while a similar arrangement of a flight of steps is one of the commonest methods among artists of classic taste. One reason for the use of these steps is to get the figure high up the picture, without having also a huge length of foreground. The management of the perspective also affects the relative size of the figures. The greater the distance of the spectator before the picture, the more equal in size

FIG. 180.—1. St. Luke, Mosaic at Ravenna; 2. Correggio's 'Ecce Homo'; 3. Death of Aigisthos from a Greek vase.

will the figures be. Thus, if one figure be six feet behind another, it will appear very much smaller than the figure in front, if the spectator is near; but it will be much more equal with it in size, if the spectator is further away. Fig. 181 A and B will illustrate this, and will demonstrate the fact that if the proportion between the distance of the one figure backward, and of the spectator forward, be maintained, the figures will be precisely the same size although at different distances. In both diagrams the pavement is in squares of one foot. In A, the rear figure is 6 feet behind the forward one, while the spectator is 12 feet before that. In B, the measurements are 9 feet and 18

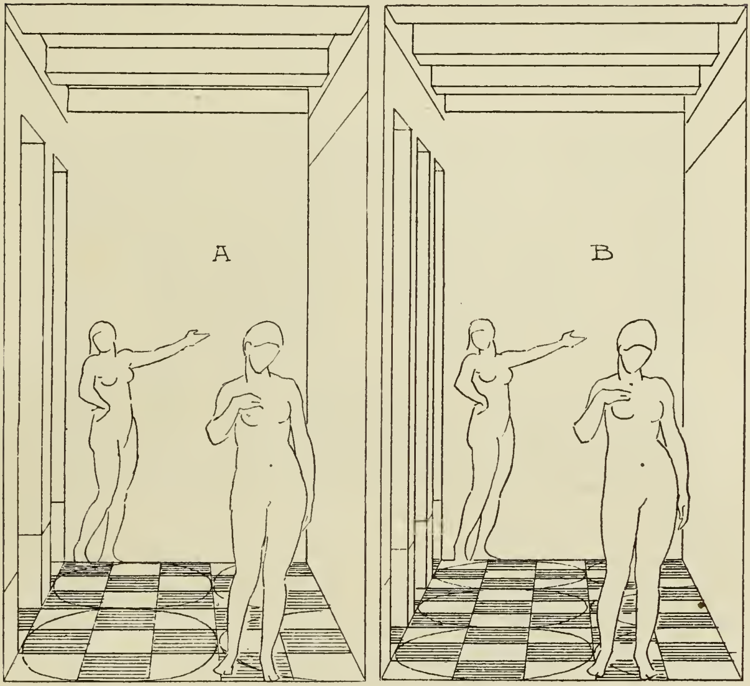

FIG. 181.—Effect of short (A) and long (B) distance perspective.

feet; thus while the figures are the same size in both, a greater depth is suggested in B. Similarly, if a figure were placed in B, at the limit of 6 feet on the ground, it would be much larger than the figure at 6 feet in A. The facts thus brought out amount to this, that figures between which there is some depth of distance, may be kept approximately equal in size, if the spectator be regarded as far in front of the picture. It will be further noticed, that a great deal more beauty of form can be got into the long-distance perspective, as shown in B. This can be very clearly seen in the representation of circles on the pavement in both diagrams. There can be no doubt that the similarity in size of the figures in Sir E. Burne-Jones's 'Golden Stairs' can only be accounted for in this way.

While long-distance perspective thus flattens the design and renders it more suitable for permanent decoration, it is appropriate in these works for another reason, namely, that we expect to view persons represented in monumental, that is large, permanent, decorative works, at a distance. The picture painters generally try to make us feel we are *with* the persons represented, hence this short-distance perspective.

It seems to have been a rule in decorative art of all times, to keep the two sides of the composition more or less symmetrical. In the Greek vases (Fig. 180, 3) this often takes the form of a figure in comparative repose, at either side of a group in more violent action, or a figure in a more varied position. This kind of composition may be symbolized by two or three vertical lines at either side, and a curved form, say a spiral, between them, and is in deference to the spirit of architecture. Stability and equilibrium employ, and are typified by, the vertical line. It is, therefore, very suitable, that as the composition nears its borders, it should become less and less interesting, and more and more in accordance with the architectural principle. This dying away of the interest from the centre to the sides, is to be noticed in many of the compositions of Raphael. The term architecture is in this sense applied to all manner of construction, and not merely to building.

It is generally held now-a-days that the figure should not be used as a support. This is perhaps quite right. It is, however, remarkable, how many instances there are, even in the very best periods, Greek, thirteenth century, and early Renaissance, in which it has been so employed. The only rule that is safe to observe is, that the law is imposed upon mediocrity, and that it is dangerous for any designer to assume that he does not come within that category. Many things there are which may not

FIG. 182.

be permitted beforehand, which may be condoned on completion.

It is well, especially in decorative subjects, to have the corners occupied by some part of the subject. It would, however, be wrong to twist a figure about, into a position it would not naturally take, in order to do this.

Before commencing the figures within the space, care should be taken to ascertain whether it is suitable for one, two, or more figures. If it is too wide for a standing figure, a seated one will perhaps do. It was by no means uncommon, in Gothic times, to put in extra figures to fill vacancies, although the subject was complete without them; and in doing this, they did better than did the artists of the later Renaissance, when they fluttered draperies, and in other like ways expanded the subject, where no such expansion was warrantable.

If possible, all the parts of the figure should show, and care must be taken not to allow any part to cut off a little from a figure, whereby it appears as if drawn too thin. Further, in overlapping figures or limbs, it will be found that they interfere less with one another if they cross at right angles.

Then again if the border cover part of the figure it must not cover much, or the figure will seem to be behind it.

86. All the Figure to be shown.

It was also a principle among the old masters to show as much of a figure as possible. This was, perhaps, due to the fact that the more completely a figure is shown, the more completely will its personality be realized. The observance of this principle was so general in decorative art as to be almost imperative. It is remarkable with what skill the old designers were able to group together a number of figures, and yet show a great deal of all of them. Raphael seems to have particularly endeavoured to show the whole length of the figure. Thus, in his 'Charge to Peter,' nearly all the figures are shown at their full length, and most of his compositions are characterized by a similar treatment. The worst example from the old masters is perhaps the 'Ecce Homo' of Correggio, in our National Gallery. (Fig. 180, 2.) The Christ is a half-length figure, but all the others are fragments. The fact that in this picture the head of Mary Magdalene has its lower part hidden, introduces that principle by its violent disregard of it, which seems to have been followed, almost without exception, by the great masters—the complete representation of the head. The following analyses speak for themselves—Raphael's 'School of Athens' contains fifty-nine heads, all the faces of which are complete, except four unimportant ones, which are cut off below the nose. His 'Parnassus' has twenty-eight heads all complete; his

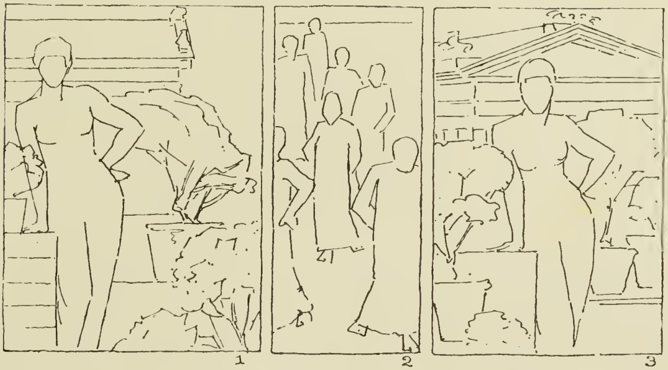

FIG. 183.

'Dispute of the Sacrament' contains in the lower part forty-one faces, of which only two very subordinate ones are partially hidden from below the nose. Precisely the same may be said of his other large compositions; in fact there is seldom a head of even secondary importance which has not the whole of the face shown. It might be supposed that such an arrangement as this resulted in conventionality, and that in ordinary nature such completeness would not be found. It is, however, one of the tasks before the artist to deal with apparently unyielding material. If Raphael's work was conventional, the charge could hardly be brought against Rembrandt's, but an examination of his elaborate compositions will show that he observed the principle of a complete representation of a face even more rigidly than Raphael, because he generally allows himself very much less space to work in. In his 'Hundred Guilder' print are forty figures, many necessarily represented by heads only. In the dark side of the plate are two heads, which are cut off below, but they are so dimly seen in the general gloom of that part, that it is difficult to make very much out. If these two heads be omitted, there is only one face cut short, and that so slightly as not to interfere in the least with the intention of the figure. It is the head of the cripple on the right of the centre; but of the face, only the tip of the nose, the mouth, and the chin are hidden. All who have seen Rembrandt's etchings know that in them every face has a complete history written in it; every person could, as it were, be followed home, and the various circumstances of his condition be noted. It is undoubtedly because of this great interest, which he threw into every face, and without which he could not draw them, that he endeavoured to show the features as completely as possible.

The expression of violent action must be avoided. It is not necessary, however, to keep the figures timidly straight. All that one has to do is to prevent limbs in very definite action showing in their natural thin and angular manner, and this can be done with drapery. (See the central figure of Fig. 173, and see p. 19.)

If a figure has to be elevated by an extra stone beneath its foot, or to hold to a bough, let the part the foot rests upon or hand holds be a lesser part of the stone or bough. Otherwise the propping will be painfully evident.

We should avoid in decorative works placing one thing before another, as when branches of a tree go behind a figure, for such arrangements suggest distance and demand the expression of it. It is well, however, for there to be some overlapping, as it combines the design; but the parts crossed should be as small and subordinate as possible.

The same form should not be repeated in a composition. That is to say, two heads should not be alike in position, nor should two bent arms meet at the elbows, forming a kind of cross.

87. The Point of Sight.

THE chief point of interest nearly always occurs at or near the centre of the picture, for when one looks at a person or an object of any kind, one of course makes that object the centre of one's vision. If, therefore, a frame were placed round any fact in nature, which happened to form the subject of observation, the subject would be found to occupy a position in the middle of the frame. A figure is not, however, always found placed centrally; Fig. 183, 1 and 3, illustrate the two different treatments of the same subject. And so it may be taken, as a rule, that the object of first interest goes to the middle of the composition. If, however, two figures or groups of figures divide the interest, and the subject requires an amount of space between them, then they will occur somewhat equidistant from the centre. This treatment has been very largely employed by Mr. W. Q. Orchardson. It might be said, indeed, that the ground-plan of what dramatists call "the situation," occurs midway within the picture; thus frequently the subject resolves itself into three or more groups.

The horizon should always be within the field allotted to the subject. Pavements having lines vanishing to the centre of the horizon have the contrary lines parallel to the lower border, but if the composition is wide it is well

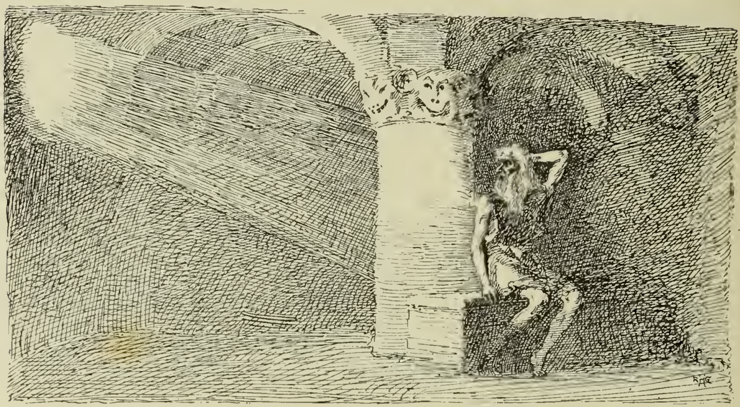

FIG. 184.—(Here the composition is balanced upon the centre line. Somewhat as with a steel-yard the important part is near the centre.)

to curve the horizontal lines up a little as they approach the sides. If the pavement does not vanish to the absolute centre the contrary lines must not be exactly horizontal.

88. The Value of Profile.

IT has been remarked in the paragraph on conception, page 8, that the profile is more intelligible than foreshortening and shading, for although an educated person can understand these means of expression perfectly well, yet just as the profile is more readily understood by the uneducated, it maintains its precedence over the others in the understanding of the cultured. A profile is that outline of an object which most completely reveals its character and form. It is a recognized principle of decorative art that the form represented should be as rapidly and easily understood as possible. This is in obedience to the feeling that the decoration must not demand, because it cannot receive, more attention than can be given in a glance. The figures must then be placed toward the spectator, in such a manner as will present least difficulty to their being understood. An examination of historic pieces of decoration would exhibit the truth of this statement. In Greek vases, perhaps, which are among the most beautiful examples of figure decoration, there are very few cases indeed of foreshortening. Where, however, they occur, it is always in some one of the few general poses, in which it has been introduced in almost all styles. These are the figures in front view, with arms almost always spread out; the thighs foreshortened in the seated front view of the figure, and the three-quarter view of the head. We must note that a three-quarter view of the head is often preferable in decoration to a side view, the delicate outline of which cannot always be properly expressed, while in the other view both the eye and nose are seen in almost their simplest form, the eye in full view, the nose in profile. Occasionally a foot is presented in front view, but this is exceptional. Historic art of all times, Classic, Byzantine, and Gothic, is full of examples of the observance of this rule, and there are very few exceptions. And it will be found that even in paintings by the great masters, a similar simplicity is continually observed. Once or twice artists have chosen difficult positions, apparently in order to excel in their representation; Luca Signorelli frequently introduced figures lying on the ground, and vanishing directly from the spectator. And in French Art, under Louis XIV. and Louis XV., the artists were never tired of representing figures flying in the air, in the most remarkable of positions.

89. Conclusion.

THE Renaissance covering the last four hundred years or more takes its name from the revival of classical learning by which it is distinguished. To the historian this revival is of the greatest interest, but of even greater is the development and decay of Monarchism. The central principle of Monarchism is unquestioning subordination of the individual to a central authority over which there is no control. This involves the complete abolition of conscious freedom, but in the hands of a Cromwell it imposes such regulations as allow the individual all the freedom he could claim or desire. Monarchism at its best enables a man incapable of self-government to live the life he himself would choose. It is not confined to politics, but may also hold sway in both religion and art.

Every one admits that Louis XIV. was Le Grand Monarque, and he ruled in art as well as in everything else. Monarchism thus set its hand upon art, and said to the artist, not what can you do, and what can you feel? but, can you do this, can you feel this?—for nothing else is admissible.

And this monarchistic control of art could not have been so complete in any period but the Renaissance. People do not intuitively understand a phase of art altogether foreign to their land and time, especially if it be only incompletely seen. Only those who were able to receive such an education as made them acquainted with the details of the outward form of a civilization accepted at the time as the best, and therefore only, model, could either appreciate or produce works in the chosen manner. Unfortunately it was only the style and external aspect of the classic forms which engaged the student's attention, not the spirit which had in Greece or Rome produced those forms. It was therefore within the grasp of any one who could absorb classic detail to become a critic of art. The true essence of criticism, the comparison of result with the demands of one's own best native feeling, was lost, and the driest formulism substituted. One can only work in such an art by becoming unthinkingly and unfeelingly devoted to it. And this blind devotion ruins real art. Rabelais early in the Renaissance saw that you should "do as you like."

Men living under similar conditions will, when doing what pleases themselves, produce things similar, and this is how the various styles of the past were produced, and not by any King Louis saying, do this or that.

The sceptre of Louis passed to the established Academies; and so the profession became exclusive, and its masters were careful to keep art among the clouds. Rules, principles, precepts, and maxims were to be found in great profusion, but intelligible only to the initiated, the connoisseurs, or *those who know.*

During the last fifty years the power of Monarchism in art has sensibly declined. Photography and steam-locomotion have placed at our doors so many varying examples that it is plain that the kind of art which has its establishment among us is by no means universal, and that thousands of people have been happy without it. And principles are jostled so rudely that we come at length to see that we can, and perforce must, "do as we like." Only that part of our work which comes from our own hearts will be pleasure-giving, or in any way expressive; whatever we do because it is proper to be done, or because some one says it should be, will be so much dead weight upon our little genius.

While we must not bind ourselves to any man's principles we gain by scanning them, because it is probable we are neglecting principles equally inherent in our own natures, but dormant, or overcrowded in some way or other.

The practice of art requires, I am sure, as much the training of our moral nature as the training of hand and eye. Principles of art are based on that moral substratum upon which all character is built. The artist must do things which please himself, and must throw to the winds the monarchistic principle of doing what is approved or by law established.

If our first precept must be to do as we like, and to please ourselves, our second must be to approach all things in such a spirit as to do full justice to their delicacy of construction, or beauty of form. Warned by the Selective Idealism with which the century opened, and the Romanticism which followed it, the realists of to-day pursue actuality with sometimes an unwillingness to see delicacy and beauty where they exist. They know only too well the error and danger of looking at nature through rose-tinted or green spectacles; and they would rather be accused of nasty realism than prettiness. Idealism must be left for those who can idealize, or rather for those whose thought metamorphoses their work into ideal forms; but the only sure ground for the student is Actualism with willingness to see delicacy of construction and beauty of form. The true idealist never knows that he idealizes. Those who portray that which is not before them run the risk of falling below realism; but if the fruits of this effort of imagination be worth more than the loss of realism entailed, the effort is justified.

Nor must Realism or Actualism demand always a complete deceptive representation. To say that it does, is to banish at once the drawings of Charles Keene, to mention but one master of realistic black-and-white.

This brings before us again the relative value of shape, tone, and colour. That they are all both explanatory and æsthetic we have before remarked (page 5). We will make no choice among them, but may notice that shape particularly exhibits fact; tone, force or vivacity; and colour, beauty. And also that colour can express nothing without shape, and possibly, without tone or strength of tint also; that tone cannot stand without shape, but that shape can exist alone.

Just as the photograph and the drawings of Charles Keene are realistic, so may be a drawing executed entirely in blue, or in yellow and grey, or outlined heavily and tinted in beautiful but suggestive colours. It may be asked, how can a face be blue? The reply is that it is not the face but the drawing that is blue. The yellow and grey are not only pleasing in themselves, but denote the cold and warm parts of the subject. Such treatments are not opposed to realism; for the spectator sees at once the suitability of the means adopted.

All art is conventional, or rather conventionality enters into every branch of it. The most imitative of pictures must be attuned to the limits imposed by the frame; this is its conventionality. Between such a work as this and such a silhouette as Fig. 180, 3, there is or need be nothing to choose on the score of realism; indeed the silhouette may be the truer to nature of the two.

Pictorial art displays facts of life and experience, ornamental art seeks first to make life beautiful. The two naturally cross or overlap, but without in any way neutralizing one another, when pictorial art enters into the pageant of life, or ornamental art exhibits natural forms, for these must necessarily be subjects of interest or experience.

Conventionality is simply suitability, so that the greater the demands of suitability the more conventional becomes the result. One always has to choose one's means of expression, even for pictorial work; whether it shall be clay, ink, copper, or paint; and this choice is itself an act of conventionality. To this has only to be added the adaptation to the limits of the paper or canvas, and all the demands of suitability are enumerated. In decorative art there are of course greater demands, and these must be supplied without trenching at all upon realism.

The means of expression as determined by suitability has nothing whatever to do with the designs being decorative instead of pictorial. Take the case of a thick outline which is generally regarded as a decorative means: it has nothing to do with the decorative suitability of a design. Such a suitability is determined by the presence of the decorative laws of even-distribution, implying richness; legibility, which rejects violent foreshortening; flatness, or lack of projection, which is particularly hostile to strong shading, or aërial perspective; harmony with the constructive scheme, &c. Therefore a composition is not made decorative by adding a thick outline, unless it has had decorative qualities before.

The rule to follow is to adopt such means (whether outline, tints of colour, low-relief, incising, &c.) as are suitable for the purpose in hand, and with them to realize as closely as possible. This is what the Greeks did when decorating their vases.

The only opposite to Realism is untruth. The conventionality of which the realist complains is method out of place, as dirt is matter out of place. Designers are apt to fancy, and boast, that decorative art is higher than pictorial, as if either could be the higher, though a work of the one may excel a work of the other. They allow themselves to think they need make no effort to realize; and that every error is excusable under the plea of conventionality.

Exactly what means of expression should be adopted in decorating this or that object, must be determined by the exercise of that faculty or judgment, which should mark the artist from other men. It is entirely a matter of taste.

In closing this book we may not do ill to write down the following precepts—

Do as you like.
Please yourself, or you will please no one.
Actualize, but look for beauty.
Realize in suitable methods.
Make the most of modest means.

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THE END

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