THE AMERICAN

DRAWING BOOK

J. G. CHAPMAN

THE

AMERICAN DRAWING-BOOK:

A

MANUAL FOR THE AMATEUR,

AND

BASIS OF STUDY FOR THE PROFESSIONAL ARTIST:

ESPECIALLY ADAPTED

TO THE USE OF PUBLIC AND PRIVATE SCHOOLS, AS WELL AS HOME INSTRUCTION.

BY

J. G. CHAPMAN, N. A.

"Any one who can learn to write, can learn to draw."

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ANY ONE WHO CAN LEARN TO WRITE CAN LEARN TO DRAW

and, as writing is not taught to those only who are destined to become authors, but as forming an essential part of general education, so is drawing equally important to others besides professional artists. To write —to draw a form or figure that shall be recognised as the representative of a letter or word, is one thing; and to be able to design, draw, or write such forms, upon principles of grace and accuracy—to understand the Art of writing—is another. Thus it is also with Drawing, another mode of expressing ourselves, not less useful or necessary than that by letters

or words. To draw a horse, that shall not be mistaken for a man, is one step; but to draw a horse, with all his just proportions and developments, movement and expression, is an Art to be acquired. Any one can make something on paper to look like a tree, a cottage, a road, a brook, or a mountain; but Art goes farther, and, as if to compensate for what it falls short of, invests the whole with a charm more impressive than the reality, even to the most simple-minded cow-boy, who may have gone that road or waded that brook a thousand times, unconscious of the beauty that surrounded him, until it was developed by the hand of Art.

Who has ever hesitated to teach a child to write, because it was not intended that he should be an author? How many regard the art of Drawing as being of no practical importance, as a branch of education, to any but professional artists; and consider it, in its most favorable light, as a mere accomplishment — a pursuit only for the man of leisure? The resources of our schools are often exhausted in "finishing" our youth with "every accomplishment;" laid on so lightly, that, for all real and practical purposes, they are as ephemeral as the gay tints of the painted butterfly. Smatterings of languages, living and dead, are heaped upon them, while the great, universal language, the language of Design, is forgotten; or only thought of in the production of some huge "castle and ruins, with a man and a boy with a stick; and a dog" — painted by the teacher, under the scholar's direction, to hang in the parlor, as the veritable, first, and last, and only production, of the latter: who at once assumes, therefrom, an oracular authority in all matters connected with the Fine Arts, and leaves admiring friends in wonder, at what "he might have done, had he not given it up." To such, it may be said, "You have never begun."

It is not only as a beautiful accomplishment, or a source of amusement for leisure moments, that the art of Drawing should be cultivated. It has its practical uses, in every occupation of life. It opens to all inexhaustible sources of utility, as well as pleasure; practises the eye to observe, and the hand to record, the ever-varying beauty with which nature abounds, and spreads a charm around every object of God's beautiful creation, unfelt and unknown to those who have failed or neglected its cultivation. It does more: it gives strength to the arm of the mechanic, and taste and skill to the producer, not only of the embellishments, but actual necessities of life. From the anvil of the smith and the workbench of the joiner, to the manufacturer of the most costly productions of ornamental art, it is ever at hand with its powerful aid, in strengthening invention and execution, and qualifying the mind and hand to design and produce whatever the wants or the tastes of society may require.

Many are deterred from attempting the art of Drawing, from an idea that they lack capacity, or, what the world calls genius. But have they ever made the attempt? Let them recall to mind their first steps in knowledge of every kind, and judge not unfairly of their capacity, until they have tried this also. Before they knew their A, B, C, they could tell a man from a dog, by the picture. The impressions of form are the first made on the infant mind; and were it taught, betimes, to trace these impressions on a slate, there would be few in the world incapable of speaking the language of Design. The untaught savage thus records the story of his battles; as the traditions of his fathers have come down to him from generation to generation. He directs the traveller on his way, by marks in the sand; tells him, by his rude outline, of mountains and rivers to be passed; and no one can mistake his meaning. Who is there, in civilized life, that may have been familiar with works of art from childhood, that can not do this? If he can, he can do more. He possesses the germ within him, and needs only proper cultivation, to bring it forth.

As in other arts and studies, all can not expect to be equally perfect, so all can not expect to rival the master-spirits in the arts of Design. The work of an artist is that of a lifetime of arduous toil and study. Of the thousands who delight themselves and their friends in music, how few have composed an opera, or even achieved the composition of a single air? Yet, what would the world lose, were none to attempt the cultivation of this refined and charming accomplishment, but those who devoted themselves, exclusively, to its pursuit! Were music neglected as a study by all except those who make it the business of their lives, even they would find few to admire and sympathize with them, in their greatest productions, for want of taste and understanding.

In the elementary portions of this work, the smile of the professional artist may be moved, when he finds the author dwelling on what some may think trifles, and giving instruction in the methods of sharpening a pencil and making a pen. But let him remember the day that that instruction might have helped even him. When the pupil in Drawing has attained a proficiency to place him in the position of an artist, his course of study will require a direction beyond the means of these pages to afford him. This he must obtain elsewhere, and pursue, with that fixed determination and singleness of purpose, by which excellence is only to be achieved; and he will find that, could all that he requires be placed at once within his reach, it would be, in a measure, valueless, for want of that strength to appreciate and appropriate such advantages, which is best acquired by patient search and progressive attainment. Short-cuts and easy roads to

knowledge give but little real aid to him who has a long and arduous journey to pursue; though it is scarcely worth while to hazard an experiment, by which the spirit may be broken down with toil, in a path into which we occasionally diverge, as a recreation, or an accessory to other pursuits.

From the delight, as well as profit, that awaits them, all may be safely invited and tempted to the study of Drawing. They may find difficulties; but they will find pleasures, also, of the richest kind. They will find flowers blooming along their way, and wonders opening before them at every step: nature unfolding her ample volumes, and displaying combinations of beauty and delight, beyond the power of words to tell them of. It will be theirs, to record the ever-changing pictures of earth and heaven; to give them body and form, in which others, less favored than themselves, may participate through them: theirs, to preserve the image of some cherished object long after it has ceased, in its reality, to exist—or, perhaps, to call forth some priceless treasure from the world of poetry and thought.

To those who have in view more than mere pleasure and amusement in the pursuit of the art of Drawing, may be fairly promised advantages that they will surely realize; and a portion of this work will be devoted especially to those who look to the application of the art to its most practical purposes. Most of the difficulties constantly felt by artificers in the execution of their handiwork, will be obviated, when the same hand that executes can design. Let our mechanics have their apprentices instructed in Drawing, and the effects will be soon evident in their work-shops. They will no longer depend upon foreign inventions, that are, after all, little adapted to the wants, tastes, and habits of our people. Let these wants be supplied by articles, at once more useful and equally ornamental, of home production. Let them learn to use their own strength, and their reward will follow.

The manufacturers of Europe are drawing closer and closer the connexion between the artist and the workman. At first, they borrowed aid; now they are acquiring knowledge for themselves. For the promotion of this object, schools have been long established on the continent, under government protection and support; so much importance is attached to their existence, as a measure of national policy. The influence of these schools was so strongly felt in England, to the detriment of English industrial art, that it became a subject of alarm to her statesmen. All the capital, energy, and strength, the superiority in material and mechanical facilities of England, could not contend against the higher excellence of her foreign rivals. As the voice of one man, her mechanics and manufacturers confessed the truth, and demanded

protection from the government — not by tariffs, but by education. Her legislators saw the evil, and at once applied the remedy, by the establishment of Government Schools of Design. These have been attended with such beneficial results, that there is now scarcely a manufacturing town in England that has not claimed, and shared, the advantages of provincial branches. Our mechanics can, and must, do for themselves what our own state and general governments have, hitherto, shown such indifference in undertaking for them. To no other cause than ignorance can this indifference be attributed. Were the rulers of our land, themselves, properly educated, they would not only feel the necessity of teaching Drawing in our public schools, but would be capable advisers and promoters of efficient means of carrying it into effect. He who writes himself, and has been endorsed, "Master of Arts," by our colleges, should at least know something about them; whereas, in most cases, the arts are subjects on which, above all others, he is utterly ignorant.

While foreign arts and manufactures have inundated our markets, to the detriment of our own enterprising mechanics, and politicians have convulsed the land with schemes, and plans, and measures of protection, all seem to have lost sight of one of the great and primary causes of the evil — the want of artistical education among our workmen. They are taught to read and write, to hammer and to saw; but to design — the first motive, the very genius of all arts — is utterly neglected. While it is so, we must compete with the old world, especially in the production of articles of taste, on most unfavorable grounds. The spirit of independence, that will one day cover the western continent, seems not, as yet, to have entered our workshops. We are, in this respect, comparatively, still a colony of Europe; borrowing and adapting, but doing nothing for ourselves; waiting for every novelty to cross the seas, to imitate it — creating wants by reproduction, and burdening society with anti-American tastes and caprices, instead of supplying them with objects no less useful for being beautiful. A few imported pattern-books, of little value, because not adapted to our purposes, constitute the resources in design, of most of our mechanics. Require them to make something to suit a given purpose, that shall be at the same time ornamental, and you ask an impossibility. Even if the workman may have a vague idea in his mind of what is wanted, he can not give it form: perhaps he may have the spirit to make the attempt, but he can not satisfy himself — all goes wrong — his pattern-books fail him; he looks around for something to begin from, and gives it up in despair; or, what is worse, produces some deformity that disgusts his employer, who will not venture on a second experiment, but sends abroad, and gets what he desires. Can the mechanic complain that home manufactures are not encouraged? Had he possessed even an elementary knowledge of

Design, he would have done better; had he cultivated and perfected that elementary knowledge, his difficulties would have all vanished, and the beginning and end of his labor would have been placed at once before him. Make them artists, or, better still, artist-workmen, and, with their proverbial energy, intelligence, and enterprise, no limit can be placed to what our mechanics may achieve.

A knowledge of Design, even in copying, gives great advantages. If he understands the principles upon which the original is produced, there is no fear of the workman committing offensive variations. How often do we see the most beautiful designs distorted into deformity by the variation of a single line; an error of ignorance that must continually occur, until our mechanics are better instructed in this branch of education. It is a vain hope, that a work so limited as this, will supply all the information the artisan should require; but should it lead him to make a beginning, he will so soon find his advantage in it, that he will be induced to pursue it farther. He will have his children and apprentices instructed; he will urge the establishment of schools and collections of models, to which they can be directed; and he will in his own time see the fruits, in the advancement of our manufactures to a degree of perfection that can never exist, without an intimate connexion between them and the Arts of Design.

There are those, of another class of society, to whom education in Drawing may prove a real blessing; whose painful and ill-repaid labors, to earn a scanty provision for themselves and families, have so often called forth our sympathies; and, while public feeling loudly declaims against the evil, no efficient remedy has been applied. Of the thousands of dependent females who are compelled to toil, night as well as day, to the destruction of health and life, and who are often tempted into paths of vice and misery by absolute necessity, how many there are who possess talent that needs but cultivation to secure them both respectability and support. The natural refinement and delicacy of the female mind renders it a fruitful soil, that should not be neglected or let run to waste, when its cultivation might realize such rich advantages, not only to themselves, but to their country. Give them the advantages of education in Drawing; begin in your public schools; let them carry it to their looms, to the manufacture of articles of taste and fancy, to their firesides, to the early education of their children;—and more, if they possess the talent,—let them take the pencil, the chisel, or the burin. Give them strength, by proper education, to feel what they can accomplish, and we shall soon see the broken-hearted victims of incessant toil worth the wages of men, in departments of industry and usefulness for which they are by nature so well adapted.

Of all people in the world, we stand most in need of knowledge in the Arts of Design. If in Europe, surrounded as they are by monuments of art, the accumulation of ages, it has been found necessary to make Drawing a part of common education, how much more essential is it here, where there is little or nothing of the sort. We must learn to think, and feel, and do, for ourselves. We must begin and carry out a new system of education in this respect; and, once placed in possession of a beginning, the energy and independent character of our people, so evident in everything else, will be made available to the cultivation of national taste in art, and the just appreciation of the sublime and beautiful. Art, in its higher efforts, will no longer suffer from the pedantry of travelled quackery, but will be elevated in itself, and elevated in its efforts, by the existence of a fair, honest, and intelligent tribunal. The cast-off frippery of European garrets and workshops will no longer find place beside our home productions in the Fine and Industrial Arts. The vast resources of mind and matter with which a bountiful Providence has endowed our land, will be brought forth to add to its national greatness; and, although we have no vast cathedrals or regal palaces to fill with pictures and statues, or adorn with works of ornamental art, we have a vast, an independent and intelligent people to appeal to: who need only to be shown the truth, to know and maintain it.

That a general taste for the Fine Arts does exist, however uncultivated it may be, is evident. Where is there the humblest cottage that has not its walls or mantlepiece decorated with a picture or plaster figure? However rude may be the work of art which hangs as "the bright Palladium" of the cottage, yet the household care bestowed upon its preservation, and the pleasure it affords by its possession and contemplation, show an appreciation of its worth, a decided taste, that, if cultivated, would lead to better productions; for the supply would assuredly be improved in character, in proportion to the demand. A wooden clock sells the readier for its picture, and more especially, if that picture touch a chord of national pride. Washington and Mount Vernon, although pictured with a most libellous pencil, have saved many a worthless machine from the rubbish-loft.

What village school-girl is there, whose ambition does not reach to the imitation of natural objects in needlework? and, although it may often puzzle the most acute to discover a rose from a tulip, or a cat from a squirrel, in her worsted-picture, yet the taste, the inclination—to try—is there. Could she be able to select subjects for imitation, from the boundless resources of nature with which she is surounded—could she have the means and opportunity afforded her, by proper instruction, of perpetuating, by her pencil or brush, the flower she has reared, the home she has

been happy in, the resemblance of friends she has loved, what a new source of intellectual enjoyment would be opened to her. And not to her alone. The influence of that refinement of sentiment and taste, that must ever follow, will extend throughout her life, and spread a charm about her, which will be seen and felt in all her associations, whatever be her destiny.

The importance of Drawing, as a part of popular education, and the want, so generally expressed, of some popular work on the subject, by which it could be introduced, not only into schools, but home instruction, has led to the publication of the AMERICAN DRAWING-BOOK. It is given to the public with the ardent hope that it may, in some degree, awaken an interest in a branch of knowledge that has been, hitherto, strangely neglected among the people of the United States; not so much from indifference to its importance, as from the want of efficient means of its acquirement.

Of Teachers, all that can be required, is, to give it a fair experiment.

Of Pupils, is to be asked, a faithful observance of the course of study recommended — not to grow weary, if sometimes they find their patience taxed too heavily. Let them be assured, that nothing more is demanded of them than is believed to be absolutely necessary to their advancement. If, at any time, a doubt should arise in their minds, as to the utility of that which is required of them, let them persevere a little farther, and they will be satisfied. There are few secrets to teach: all must depend upon their own exertions. The business of the Guide is to direct their steps in the right way, and to supply them with such information as they may require in their progress, not to bear them on his shoulders. The correction of their own errors, and the knowledge of the means of their success, will supply the rest. One promise, in conclusion, can be safely made: the gain will well repay the effort. Let them not hesitate, for fear of failure, but be assured, that the measure of their success will be in proportion to their exertions. When once they have passed through the elementary studies of art, they will need no incentive beyond the reward they will receive in its practice — a new world of enjoyment, a new sense to appreciate its worth, will be their recompense, and they will never regret the day of their beginning.

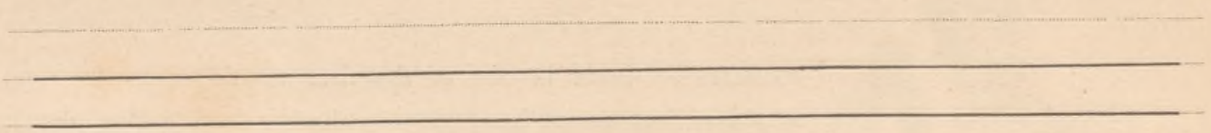
CHAPTER I.

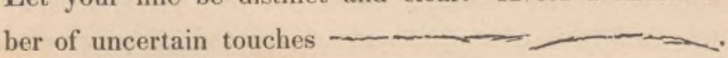
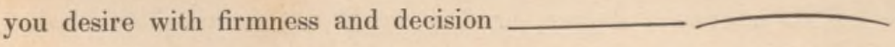
PRIMARY INSTRUCTIONS IN DRAWING.

A FACILITY of hand is one of the first requisites in drawing, whatever instrument be employed, whether Pencil, Pen, Brush, or Modelling tool. Many are by nature endowed with a certain mechanical dexterity, or happy readiness with the fingers, to whom this facility is of easy acquirement; and all possess it, to a certain degree, or they could not be taught to write, which, in the beginning, is nothing more than the *drawing* of certain conventional forms, without any distinct idea of an object beyond the imitation of such forms. The first "pot-hook and hanger," is, clearly, *Drawing*. If the pupil has improved upon this humble beginning, so as to write a fair hand, he already, perhaps unconsciously, possesses an acquirement that will not only make easy his first essays in drawing, but essentially serve nim, however far he may extend its pursuit. Should this useful accomplishment have been neglected, he can not do better than practise his hand in the careful imitation of good specimens of penmanship, or place himself under the instruction of some good writing-master. The use of the pen has been too much overlooked by draughtsmen, especially by amateurs. It produces a certain line, and induces an early habit of care and accuracy, from the fact that it can not be easily erased. Many are falsely captivated by the spirited dash of a master, who overlook the means by which that ease and freedom have been acquired. It is the result of accuracy and labor; and to imitate the end, we should not shrink from the beginning. Let us lay well the foundation, before we begin the structure. He who starts with the black-lead pencil in one hand, and the Indian rubber in the other, will find, however convenient the latter may be, that he will soon fall into a loose and slovenly habit, of which it will be difficult to

divest himself. They are both good and serviceable in their places; but too often, in the hands of beginners, most sadly abused.

2. The first object of the beginner should be, to acquire a readiness in observing and forming simple lines, with their relation one to another, their direction, variation, beginning, and termination; also, to make a duplicate of any given line. Take, for example, a sheet of ruled letter or foolscap paper, and begin by tracing over the lines with a pen, from left to right, and from right to left —



Let your line be distinct and clear. Avoid a habit of feeling your way, as it were, by a number of uncertain touches  . Endeavor, at once, to express what you desire with firmness and decision  .

3. The system of these early lessons, to those who find it difficult to attain precision of hand, is of so much importance, that it is strongly recommended, especially for schools; where it should be commenced as soon as a child is taught to hold a pen or slate-pencil. By it the instructor will find his pupils more rapidly acquire a good hand in writing, as well as drawing; the eye, as well as the hand, thus being made progressively familiar with the observation and imitation of lines and forms. The drawing-master comes into our schools at too late a day. Every teacher can and may be one. A child knows its first letter by its form, calls its name, and remembers it, by that knowledge; and few there are, who can not make their letters on a slate, as soon as they know them in the book; rudely, it is true, but still in a manner to be understood. And yet this first impulse of nature is too often disregarded; the child is driven from that which might be to him a source of amusement as well as profit, and made, by the forced discipline of schools, to learn to read before he learns to write. "One thing at a time," may be a good adage for old heads, but childhood needs variety in its labors. Its mental exertions should be tempered by agreeable diversion, and, more especially, when that diversion can be made of lasting benefit. We may rely upon it, that the child, who loves his slate better than his book, will soon, by a judicious indulgence, learn to love them both together. The truant and the sullen prisoner to the school-bench would become the willing learner; and the early habits, thus acquired, of

observation and appreciation of the beauty and wonder of creation, will lead to a healthful thirst for knowledge, the truest and surest incentive to the study of books.

4. In view of the importance of this early education in drawing, as well as to assist teachers in carrying out the system proposed, there have been prepared Drawing or Copy-Books, ruled and headed, on each page, with progressive examples, similar to those which will be given in the course of these rudimental instructions. Thus, with little or no additional labor, teachers may at once, although possessing, themselves, no knowledge of design, be capable of affording the means of instruction to their pupils, as well as supplying their own deficiency, in an important, and too long neglected, branch of popular education. These Copy-Books may be procured of the publisher, at a cost little beyond the price of an ordinary blank book.

5. Having acquired a considerable degree of accuracy in tracing the ruled faint line, as suggested (2), proceed to fix certain points along the line, at random, and then connect them together; moving your pen or pencil (the former is to be preferred) slowly and steadily, and not taking it from the paper until the line required is completed—

Repeat this, from right to left, and from left to right, as in the first instance. After some degree of precision is thus obtained, you may, without fixing the points, endeavor to draw the lines, of the length required, by the aid of the eye and hand alone; and then, laying aside your ruled paper, see how nearly you can come to the examples given, on plain paper, on the slate or blackboard. Observe well, before you touch your paper, where the line is to begin, what direction it is to take, and where to terminate. When you can achieve this, with ease and accuracy, you have made a sure beginning; the importance of which will be felt and better appreciated hereafter, when, any amount of time and patience bestowed, in making yourself master of the principles and practice of these primary lessons, will not be regretted.

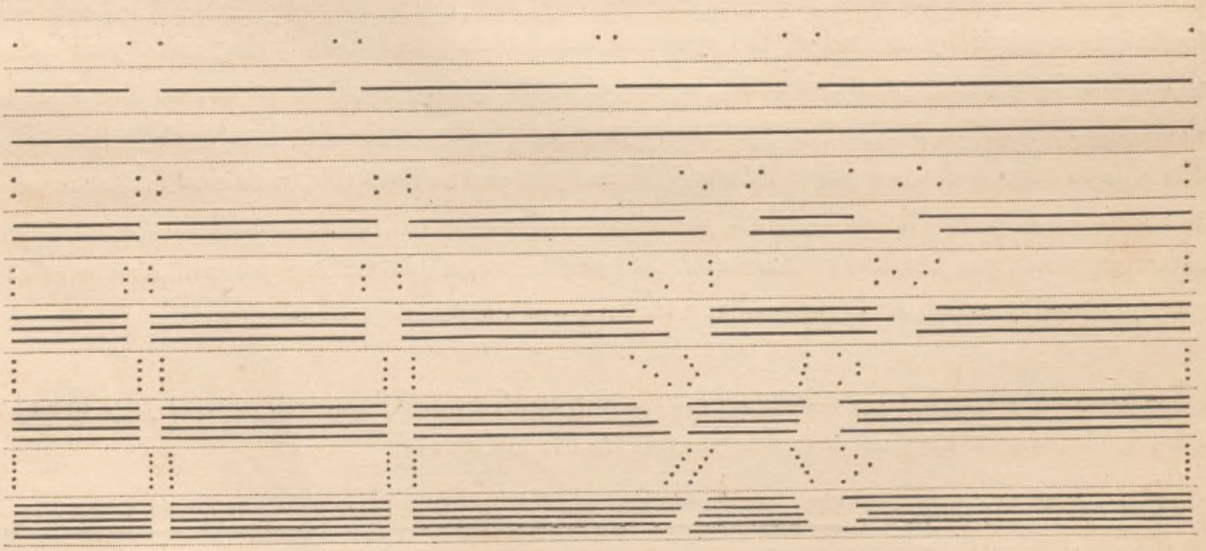
6. In your next effort, you have no longer to trace the ruled lines, but, to trust your eye and hand in drawing a line, as nearly as possible, in the middle:—

A difficulty will be felt, at first, in drawing continuous lines, of great length; as you will find

your hand liable to get the start of your observation, and stray from its proper direction. They should, therefore, at first, be short. Increase their length, as you gradually acquire facility and precision. When you find your pen going astray, as it is apt to do at first, leave off, and again seeking, by your eye, the true point to start from, make another effort; and thus, until you can draw a line extending the entire width of the page. Repeat the trial from right to left, as well as from left to right.

7. In this lesson, you have to keep two lines, besides the one you are drawing, under your observation at the same time. Simple as it may appear, it is one of much importance. You are already entering the broad field of Design, and are to consider yourself no longer a servile *tracer*. Here, let it be urged upon the pupil to avoid, in all cases, the pernicious habit of *tracing*. It is a tempting, but a dangerous expedient. No one can expect to attain proficiency in off-hand drawing, that relies upon it, even as a last resource. Early learn to trust and depend upon your eye and hand alone. They will serve you well and faithfully, when the clear pane of glass, the transparent paper, and the many other weak resources of weak hands, will fail.

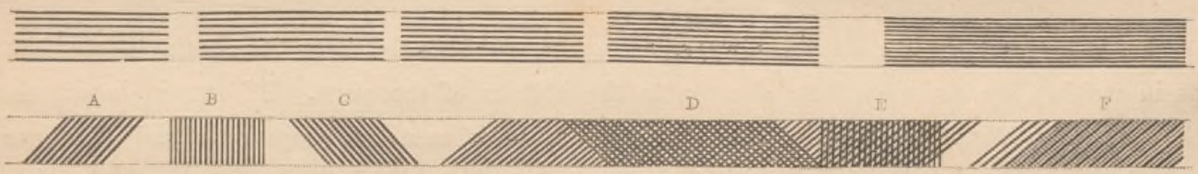
8. In like manner as in former, proceed with the following examples: First, pointing off the divisions or spaces between the faint lines, and then connecting the points carefully; bestowing as much time and practice on each example as your progress or improvement may render necessary.



9. Observe that, in adjusting the points, marking the divisions of the space between the

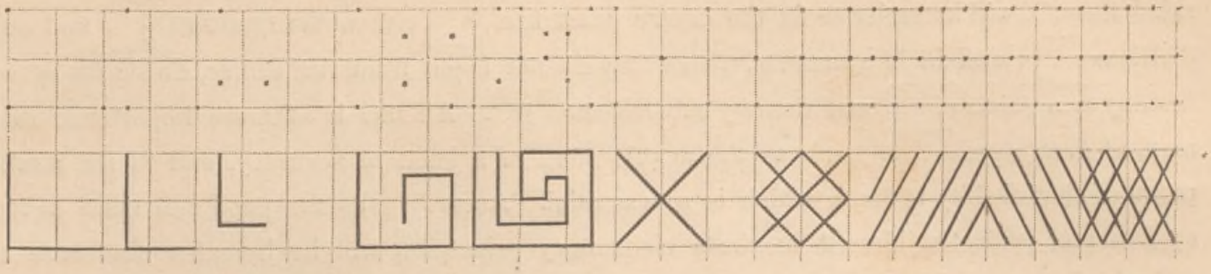
ruled lines, it will be easier to fix the centre point first ·; then the quarter ⁚, and subdivisions ⁞; and in like manner, where they do not begin from the centre, divide the space, first, by two points :, and then by subdivisions ⁞. All this is of more importance than may, at first, appear: all tends to the acquirement of a habit of accuracy, and to the attainment of that facility of hand which is so essential. According as the pupil has more or less applied and perfected himself in these elementary principles, will he hereafter find ease or difficulty in more advanced studies.

10. The pupil may now practise the drawing of lines, gradually nearer to each other, until they form an even tint, without touching. In this trial, he will begin to feel the profit of his former labor; and, according to his success, can judge of his advancement in previous lessons.

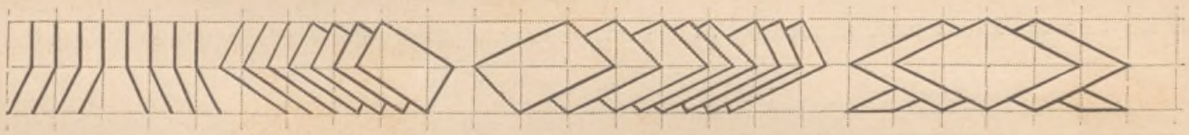


In the second example are lines slanting, upright, crossing each other, etc. A continued line or two, of each variety, is advised for practice. First, draw a set, as at A, entirely across the page; then proceed, in like manner, with B and C. Having succeeded in producing these, separately, with some degree of accuracy; begin again, and draw a set A; that done, proceed to cross them with a set of lines slanting in the direction of C, which will produce an effect as seen at D: and again, by crossing with the perpendicular lines B, will be produced E. In the case of F, first draw the lines as at A, and then a fainter interline between each one. In like manner, with advantage, you may proceed with B and C; only making them somewhat wider apart, to allow space for the interline.

11. Before proceeding with the examples that follow, attention should be recalled to what has been said in reference to fixing points, etc. (9). It will now be of much assistance to have paper ruled in squares; and if this can be done by the pupil himself, it will be all the better. If example 8 has been properly practised and understood, the following will be comparatively easy. In all, the lines form right angles, except the last, which presents, where they cross each other, what is called a lozenge.



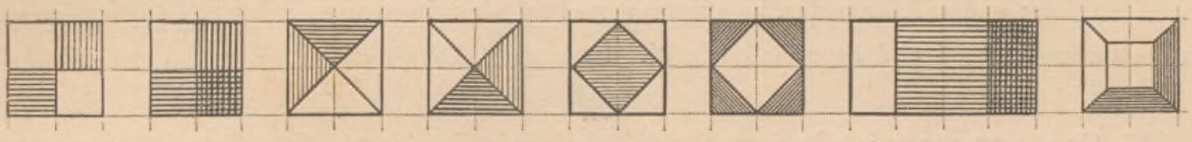
12. In drawing the following: first fix the points, and connect them as above; then proceed without them, endeavoring to determine their position by careful observation, and then expressing each line and figure with decision, unaided by the points beyond their imaginary existence.



13. The draughtsman should always, as far as practicable, keep his work before him; as in writing, we progress from the top to the bottom of the page. Of course, in drawing the general outline of an object, this would be, in a measure, impossible and improper; but, in forming tints, especially with the pen, care should be taken to avoid working over what has been done already, and which is, in some degree, the guide to what is to be done; as the pen or pencil, partially covering the lower lines, produces uncertainty. For example, it is easier to draw one line parallel to another, having the given line above the pen  , than if it were below it  . The simple experiment made by the learner will at once convince him of this; and in like manner, he will find he can draw lines to express tints or shadows with much greater facility and accuracy, by keeping what he has already done before him  , than by attempting, thus  , to overreach it.

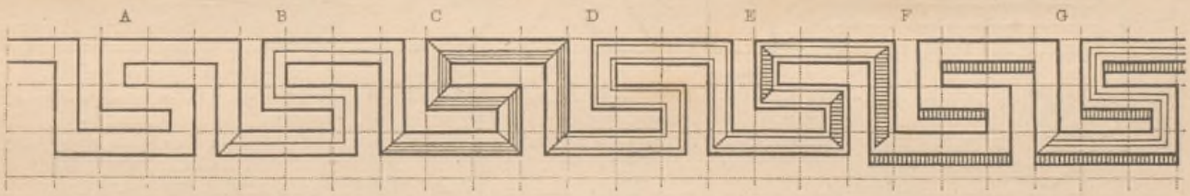
Besides, the liability of running, or blotting, one line into another, unnecessarily, is avoided.

14. The importance of acquiring a method in forming lines and tints, will be felt in the following examples:—



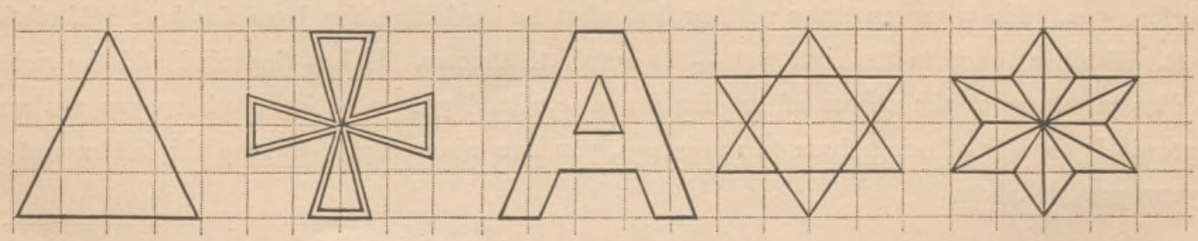
The pupil will also begin to appreciate the power of lines, in expressing tints, and in giving detail of form to simple outlines. In all of these there is one common outline, varied by divisions and tints.

15. The following figure, formed of straight lines and right angles, will show the importance of a clear and accurate outline; which, when once obtained, may be with ease worked into endless variations.



The pupil should first draw the simple outline of the figure A, upon the principles laid down in former examples (11). Having accomplished that, let him next draw the interline, as shown B; after which, he can express the tint or shadow on the figure C. Next, let him draw the faint line, near the inner edge of the outline (A) he has already done, as D: then proceed with E, and so on with F and G; always observing to draw the outline of the tint or shadow first.

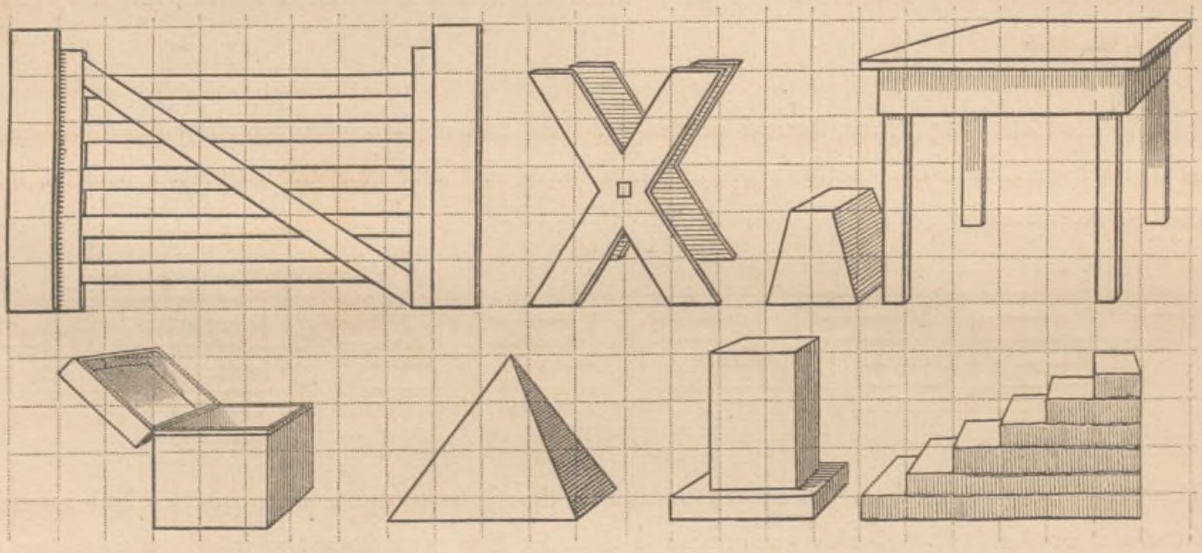
16. The following examples present forms of less simplicity, yet are equally regular and balanced in the relation of the parts to each other. They are given, not only for practice, but to



show the motive or method of their construction. If the pupil were to attempt to draw the fourth or fifth figure, for instance, by a mere outline, he would encounter great difficulty, and fail of

success; but let him study well the principle upon which that outline is produced, and he not only is able to draw it accurately, but knowingly. This principle of Design deserves important consideration; and will, hereafter, be often reverted to, when its true meaning and application will be better understood and appreciated by the learner.

17. One more example of objects formed of straight lines is added, to show, in some degree, the application of what has, thus far, occupied the attention of the pupil, and should be copied,

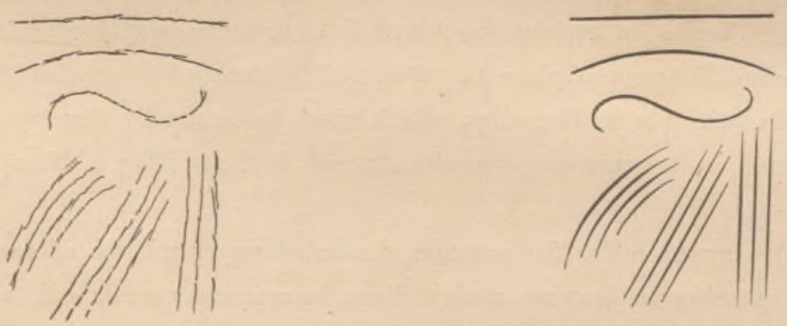


as carefully as possible, first on the ruled paper; observing well the parts or forms the lines present as they cross the dotted or faint lines; recalling to memory all that has been before said, especially with regard to the importance of ascertaining the point of beginning and ending, as well as direction, of each line. When some degree of precision is acquired on the ruled paper, try it without — on the slate — the blackboard — every way; and then try your memory, and see if it will serve you as it ought. See if you can draw a gate, a table, or a box, without the object before you. He who can draw nothing but what he has before him, loses the best half of the art. Begin at once in the right way — the surest to success. Unless the mind add the riches of its resources to the efforts of the hand and eye, and you call them forth as you are progressively capable of using them to advantage, you can never expect to reap the full harvest of your present labors.

18. Thus far, attention has been directed only to the drawing of straight lines; and, if proper care and study have been bestowed upon the principles laid down, and the hand

has been taught to keep pace with the understanding of these principles, the few examples to be given in the drawing of curves will be all that is required, before he is introduced to the great school of Art — the imitation of nature. Let him be advised not to hurry forward too rapidly — to gain strength as he goes — to confine his efforts to what he can accomplish, rather than run the risk of failure, in attempts beyond his power.

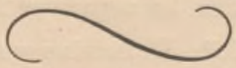
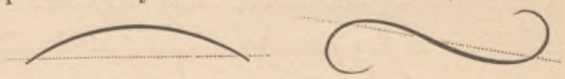
19. Again (2) let the importance of a clear, firm, and well-defined line be urged. "Think before you draw," is as important a maxim as "Think before you speak." Determine well the point of beginning and termination, the direction and form of every line, before you touch your paper. Now is the time to school your hand to this habit; which, when once acquired, will render progressive studies comparatively easy, and hereafter serve you well in your attempts, however far you may pursue the Art of Drawing. A manner of dashing off random lines or

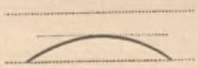
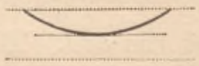
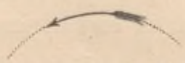
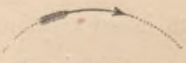


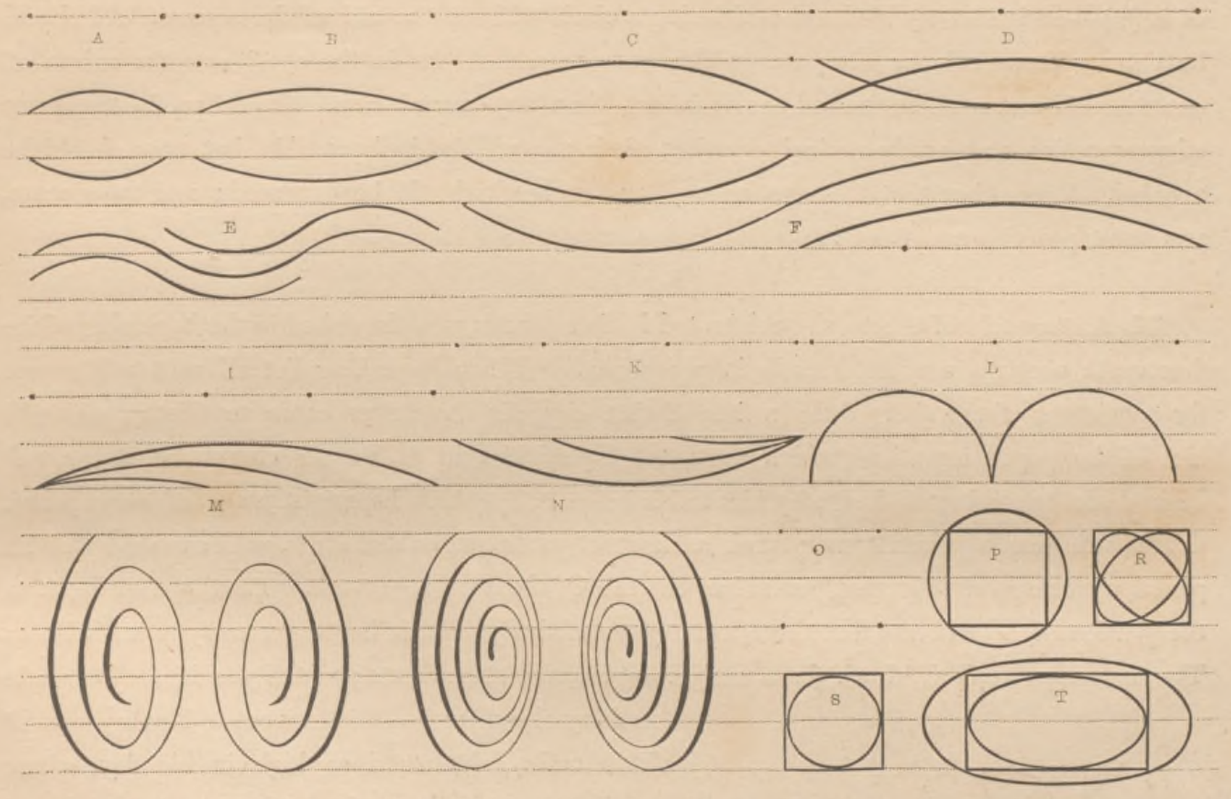
touches, as if in search of the true line, betrays weakness and indecision — besides, produces a painful display of the labor the work has cost. The ease apparent in the sketch of a master-hand, that is so captivating, is the result of absence of any appearance of hesitation or doubt. If any were felt, in its execution, it is a secret known only to the artist himself, who should always possess the judgment to look rather to results, than the ostentatious display of the labor of their accomplishment. The examples given will enable the student, by comparison, better to understand what is to be avoided.

20. In the directions hitherto given, with regard to the drawing of straight lines, the ruled paper afforded a more certain guide than it will be found to be in curves and irregular forms. The straight, or right line, must be the basis, however, upon which to form the true observation and delineation of them. A right line is certain and arbitrary; and, according to the variation of curves and irregular forms from a right line, must be measured their irregularity by the eye, and also expressed, the result of that observation. The faculty of ascertaining and expressing

the degree and character of these variations, is a most important acquirement in drawing. Hereafter, in its proper place, more will be said in reference to circles, ovals, etc., as presenting the motive of lines and forms; but, it is important that the pupil should go step by step, and, as far as possible, master one difficulty before he encounters another.

21. Let him attempt to draw the most simple curve  or eccentric line  , and he will find it, probably, no easy task to perform with accuracy; and even if measurably successful, at first, to repeat it may be more difficult. But, if he has a right line from which to mark the variations  , it becomes comparatively easy. To the beginner, a difficulty naturally will arise as to the existence of these right lines in objects in nature. The eye, by practice and proper education, learns to supply this, and soon becomes accustomed to measure irregular forms by this unerring standard. At present, it is out of place to enter, as fully as may be hereafter necessary, into the explanation of this principle in Drawing; which must be gradually developed to the understanding of the pupil, as he acquires progressive strength in the training of his eye and hand.

22. In the following examples for practice, the ruled paper will be of essential advantage. Begin, as in the exercises in drawing straight lines, by marking certain points along the ruled line (5), and then connect these points by curves sweeping at first to the middle of the faint lines, above  and below  the points (example A). Repeat these exercises from right  to left, as well as from left  to right. It is important that sufficient command of hand, to draw lines in any direction with equal facility, should be early acquired. When you can do this with some degree of ease to yourself, as well as accuracy, increase the distance between the points, as B; and after that, draw a line of greater sweep C D: and so on proceed with the rest of the examples. E is but a combination of what you have already done A; and F of C D.—I K will be comparatively easy after these, as well as L. In examples M N, observe well the movement of the line as it touches the six faint lines, and the points it marks as it approaches its termination. It starts on the first ruled line, and, making a gradual sweep, turns on the sixth, moves upward to nearly half way between the first and second: again descends to half way between the fifth and sixth, moves upward to nearly half way between the second and third, and terminates between the fourth and fifth. In example N, the same observation, with some little variation, will apply. Endeavor, in the imitation of these



examples, to draw them with a clear, unbroken line, without taking the pen from the paper until it is done. Be not discouraged at repeated failures, but try again and again, until you succeed. You doubtless begin to find that you require more than the command of your fingers in drawing: your wrist, and the whole arm, must be brought under proper government. And here, as a valuable assistant, the blackboard can not be too strongly recommended.

23. Drawing on the blackboard might be made a profitable exercise and subject of emulation in schools. The chalk should be placed in a long port-crayon, or reed, held at arm's length; and the greater part of the examples contained in these primary instructions, should be attempted on the board—the larger the better. The examples P R S T are given expressly with a view to this. Let the teacher fix the points (o), if the pupil is not capable of doing it. The pupil then should connect the points, so as to form a square (s); that done, let him draw the circle within the square—another on the outside

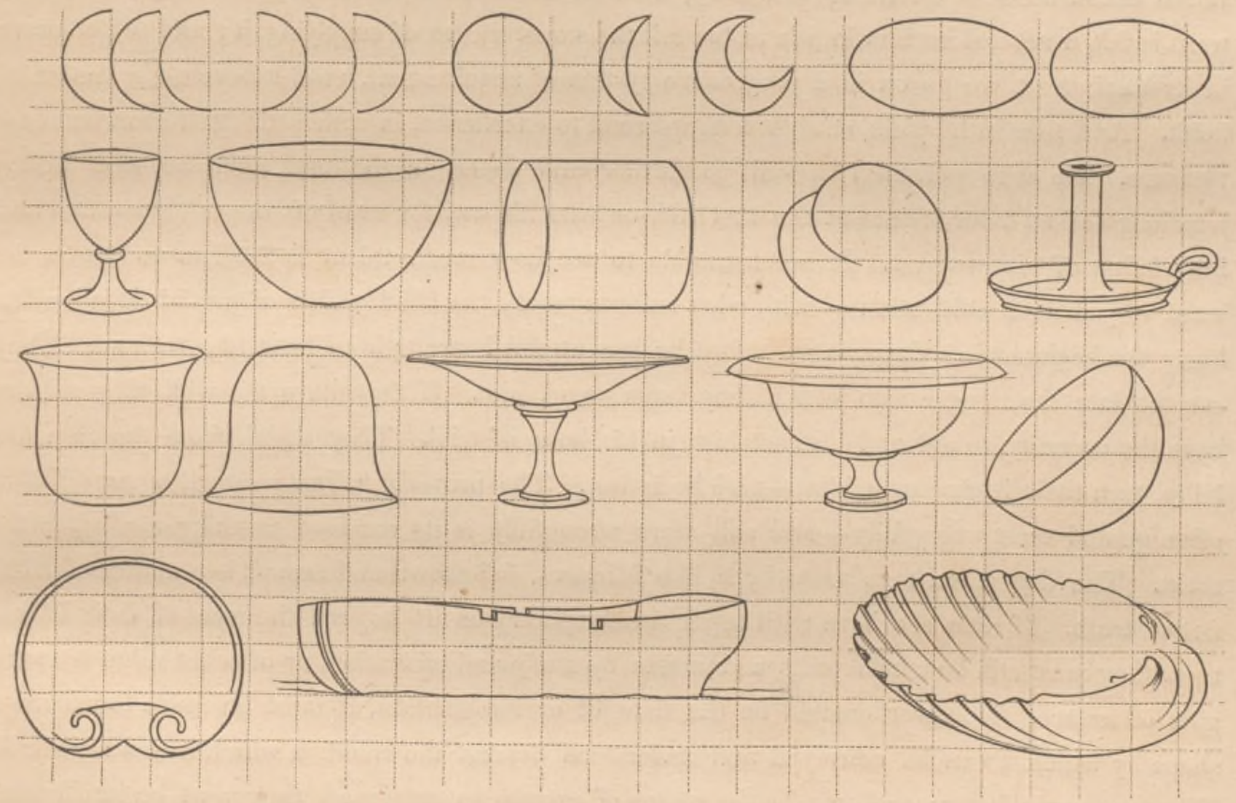
of it (F)—and then try his hand at drawing a circle without the aid of the square. All should be done without rule or compass. "The compass should be in the eye," was the axiom of one who did more, and achieved more, in art, than any mortal man. Hereafter, in the study of perspective and mathematical drawing, their use will be indispensable, but now should be avoided. Remember that the eye, as well as the hand, should be educated; and to educate, you must practise and trust it.

24. A story told of Giotto, the celebrated Italian painter, who flourished in the beginning of the fourteenth century, may not here be inappropriate. "When Pope Benedict IX. sent to Florence for specimens of the skill of the artists of that city, his messenger came to Giotto, and told him of the pope's intentions, which were, to employ him in St. Peter's church, at Rome, and desired him to send some design by him to his holiness, by which he might judge of his capacity. Giotto, who was a pleasant man, took a sheet of white paper, and drew, with one stroke of his pencil, a circle so exactly, that, 'round as Giotto's O,' became a proverb. Then, presenting it to the gentleman, he told him that there was a piece of design which he might carry to his holiness. The messenger replied, 'I ask for a design.'—'Go, sir,' said Giotto; 'I tell you his holiness asks nothing else of me.'—Giotto went to Rome ———." This artist, who stood so high in his day, whose works are so justly admired, who rose to the esteem and friendship of the greatest men of the age in which he lived, whom Dante and Petrarch were proud to own as a friend, to whose memory, when dead, the city of Florence erected a statue, was once a poor shepherd boy; and, while tending his sheep in the field, developed the talent that made him what he became, by drawing his flock in the sand, and on flat stones.

25. Fathers and Teachers—call not your boys idle fellows, when you find them drawing in the sand. Give them chalk and pencil—let them be instructed in design. "But," you say, "I do not want my boy to become an artist." Depend upon it, he will plough a straighter furrow, and build a neater and better fence, and the hammer or the axe will fit his hand the better for it: for from it, no matter what may be his calling in life, he will reap advantage. Last, not least, you give him a source of intellectual enjoyment, of which no change of fortune can deprive

him, and that may secure his hours of leisure from the baneful influence of low and ignoble pursuits.

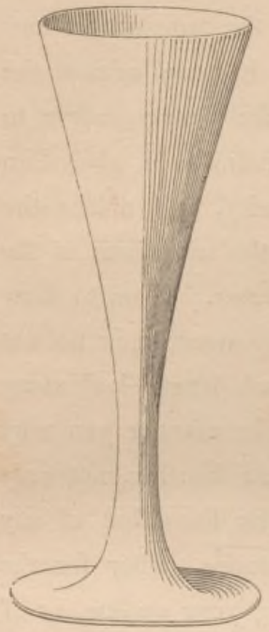
26. Again having recourse to the double set of ruled lines (11), as best adapted to assist the pupil in ascertaining the quantities of the variations of the forms before him, as well as drawing the two sides of an object alike, but little more is required than to give a series of examples for practice. The experience he has already had, will show at once their application.



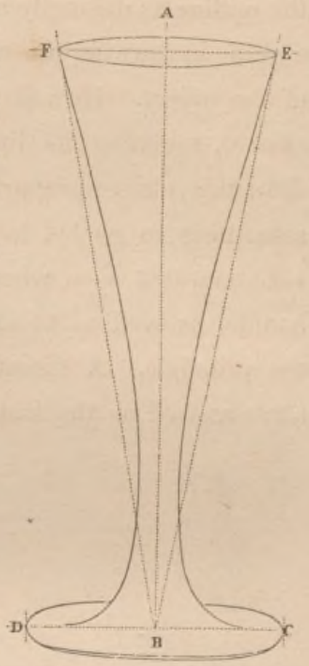
27. The pupil may now lay aside his ruled paper, and hereafter trust more to himself. It will be found, with some, that little difficulty has been felt, in the practice and understanding of the examples thus far placed before them. Even to those who may have, before this work has been placed in their hands, acquired some degree of facility in drawing, profit may be derived from examining the primary instructions here given. It often happens that we possess an acquirement, unconscious of the means by which it has been obtained, which will serve us to a certain extent, and no farther; which, by training, by strength derived from right discipline, may be made available to the highest results. This faculty, coming as a gift, too often proves an allurement from a

correct and systematic course of study; and thus wonderful boys become insignificant men, while others, of less actual capacity, get the start of them in a very little time, and soon attain, by industry, an eminence beyond the reach of indolent talent. Precocious talent, like hot-bed plants, rarely matures to fruitfulness, and, like them, is doomed to as short existence: which, however brilliant, bears no comparison with that of those reared in the fresh air, deep-rooted, developed by the early sun and showers of spring, and strengthened to resist all changes and seasons. In nothing is this more apparent, than in Design. Where extraordinary talent or aptness does exist, cultivation becomes more essentially necessary, than where there is an actual deficiency. Where a want is felt, a natural instinct impels us to seek the surest means of supplying it; and to persevere in its attainment we go on in a progressive system of acquirement, until it becomes a matter of habit. And this is the plain, straight-forward road to excellence, in which toil itself soon becomes pleasure. He who possesses it, will go farther and faster, in the end, than he who dashes headlong for an hour, faints at the first hill, or loses his way for want of proper observation and knowledge of his progress. It is lamentable to see how much talent is let run to waste, for want of judicious cultivation — with what ruinous results the blind praises of partial friends often hurry the beginner into deep water, before he has attained strength to bear him to land. They see too late the danger into which they have urged him. If they have the will, they seldom have the capacity, to aid and instruct him in his hour of trial. They shrink from the responsibility, turn their backs upon him,—and he is lost. The proverb, "*Poeta nascitur non fit*," is often quoted most wrongfully—and still more wrongfully is its received meaning applied to the artist. The day when men were born, like Minerva, full-grown and armed, is a matter of fable, not of truth. If men are born with capacities for poetry or art beyond the mass of their fellow-men, they must still be made poets and artists by study and education, or of what value are such gifts of nature. However exalted be the thought or imagination, it must be made to assume a shape by which it can be conveyed and understood beyond the mind in which it was conceived. Whether words, letters, or forms, be the means of expression employed, they must be intelligible; to make them intelligible, they must be accurately expressed, in a language not to be mistaken; and that accuracy is no man's intuitive possession. It is the result of study—of education.

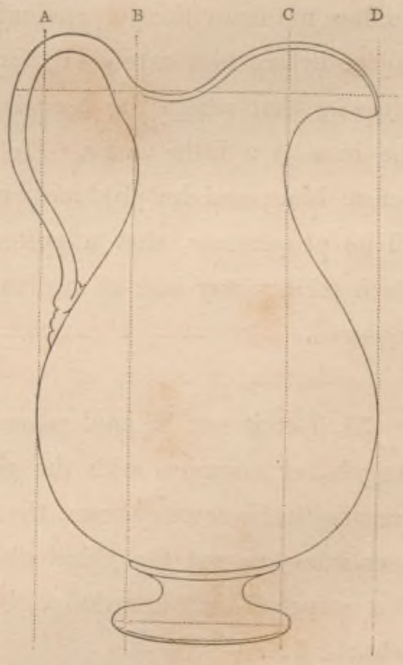
29. In the example next presented, the principles upon which the primary instructions already given have been based, will be at once evident. Take, for instance, a form as simple as a common wineglass. To draw it with any degree of accuracy, without the aid of some well-understood principle, will prove difficult, even to many who are already familiar with the use of the pen or pencil. They may make something to look enough like a wineglass for any



one to know what it is intended for; but to draw it in its exact proportions, with the sweep of the outline in perfect balance on either side; to make it a true representation of the object, some method must be used. Having fixed upon the height of the glass A B, decide upon the diameter of its base or stand D C, and that of the top E F. That done, you have sure starting points; and nothing more remains, to complete the outline, than first determining, by your eye, the variation of the curves it presents from these right lines, and expressing them exactly as you have already done in the examples before given (22). With the straight lines B E—E F to guide you, the gradual taper and expansion of the object is readily expressed by one clear sweep, easily obtained and repeated.



30. The first and greatest difficulty of the beginner will be to find and see these imaginary straight lines in objects presenting, in their form and outline, only curves. This must be acquired by judicious training. By practice and observation, the eye will soon learn to find them out, without mechanical aid. Let him, as a first experiment, for instance, hold a thread, with a slight weight attached to it, at arm's length, between him and an ordinary water-pitcher, or ewer, and he will at once see all the perpendicular lines he desires, drawn, as it were, against the pitcher by the thread. They will show him the relative variations of all the curvatures of



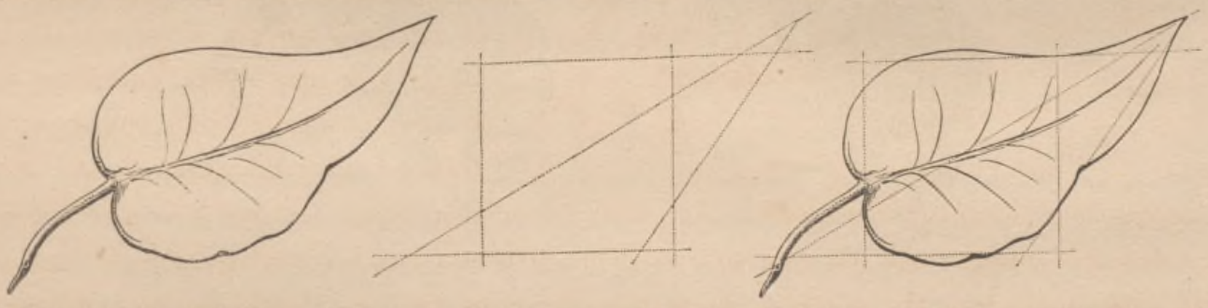
the outline as distinctly as if drawn on paper, and as easy of imitation. He will not only have a guide in drawing the sweep of the outline correctly, but, also, in marking the true proportions of the object. He will find the line D produced by the thread, drawn, as it were, against the pitcher, touching its lip and greatest circumference; while B and C, in like manner, serve to show the relative proportion of the stand or base to the neck. A, corresponding to D, gives him something to go by, in producing the general form with relative regularity, and marks the variation, first seen where the handle begins. It then serves to ascertain the true form of the handle, as well as to designate the place of its lower joining with the pitcher. Thus, to show the principle. A thread and weight are not always at hand; and if they were, they do not serve as well as the instrument with which we draw. Hold a pencil at arm's length, look along its outline, and in like manner you may readily ascertain the bearing, not only of the perpendicular lines, but of any others you may desire, either for the purpose of studying your outline, or of proving it after it has been drawn. You can thus, in a measure, be your own master, and correct your own mistakes. You may not see the practical draughtsman have recourse to such expedients; but, nevertheless, he is governed by the same principles. He sees, at a glance, the relation of the parts to one another. Although he does not draw the perpendicular lines, he sees that the swell of the largest circumference of the object before him extends no farther than a perpendicular line, drawn from the lip, would touch. He sees that where the base is united to the pitcher, it is just as wide as at the neck. He sees the base is a little wider. He marks all these points; if not on his paper, they are mentally before him; and he produces, with apparent ease, a correct drawing of the object, so just in all its proportions, that a potter shall produce a fac-simile of the pitcher, from the drawing. Such facility any one of ordinary capacity may acquire, who will take the pains and study required.

31. Let it not be understood, in saying this, that every one can learn to draw like Michael Angelo, or compose with the grace and charm of Raphael, any more than he who writes with grammatical accuracy, can, therefore, write like Shakespeare. There is a barrier that none can pass, who are not the gifted children of genius. Such men may have shone less brilliant in the first steps of that knowledge, by means of which they achieved their greatness, than many a school-fellow—

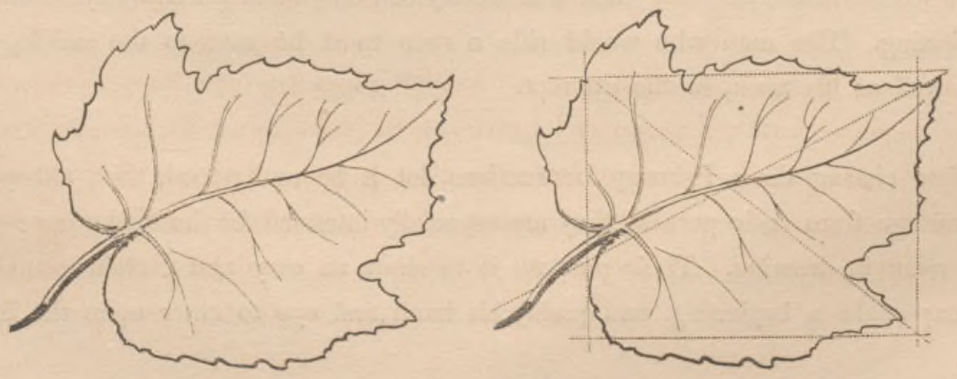
"with his satchel
And shining morning face, creeping like snail
Unwillingly to school,"—

whose fame ended in the village church-yard, or the memory of a few short years. Although the seeds of knowledge fell on a soil that was not warmed by the fire of genius, and brought forth but their usual harvest of every-day utility to their possessor, yet was that knowledge no less valuable to him, because he had not the power to use it, as it was used by the more highly gifted companions of his youth—to build upon it an imperishable fame, and blessing the world with rich gifts, to live for ever in its memory.

32. It is now time for the pupil to look to nature for objects to exercise his skill, and to endeavor to apply the instructions he has received, practically. Let him lay before him a leaf



of the simplest form, and attempt to draw it. Having carefully studied its proportions, the directions and terminations of its principal lines, and decided on them, as above shown, by a sort of diagram, or generalized idea, he should then proceed to draw in the outline, with all the features and variations of the original. In doing this, all appearance of straight lines and angles should be avoided. There are none in the original, and there should be none used in its representation, beyond their application in assisting him, in his early efforts, to fix the points and proportions in their proper places and relation to each other. Even these must be dispensed with, as soon as the eye and hand can be taught to work without them.



33. The preceding example of a grape-leaf may be found more difficult at the first trial, from the irregularity of the outline. By keeping in view, however, the general movement of the line, after a little practice, the pupil will find the difficulty gradually decrease, and he will be able to draw it with accuracy, with regard both to its general form and detail.

34. Many have found this principle of working from straight lines, serve them so well, that they have been led to its abuse, by extending it beyond its proper application; and their drawings present more the appearance of an angular congelation of crystals, or irregular brick-work, than the easy, flowing lines, that abound in objects of nature.

Even in the sketches of artists of eminence, this *manner* is often perceptible, from the habit they have of massing, or blocking out, as it were, their figures; which, however allowable and proper in a master-hand, is, nevertheless, to be avoided by the beginner, until he acquires sufficient strength and knowledge to hold a master's pencil. When once he possesses sufficient knowledge of the principles of design to be able to express a thought, unconscious of the method by which he does it, with a hand and eye in perfect obedience to his conception, it matters little what his *manner* is. It will always be intelligible. Then he may dash as he pleases, and even the most random line will be to the purpose. But this facility can only be acquired by systematic accuracy in the beginning. The man who would ride a race must be used to the saddle, or he risks its loss, as well as his neck, in the attempt.

35. Before closing these Primary Instructions, let it be understood, that, although all may derive advantage from their perusal, they are especially intended for those who have as yet made no advancement in drawing. Their purpose is to show an easy and certain course by which *any one* may make a beginning, and qualify his hand and eye to enter upon the broader field

that lies before him. The want of knowledge of the proper means of making a beginning, has prevented many from attempting the art of drawing, while others have regarded it as a mystery, only to be reached by a gifted few. It is time this delusion should be dispelled. There are no secrets in art that can not be attained by those who will take the pains necessary to their acquirement; and although, as has been before said, all must not expect to rival those, who, aided by the gift of genius, have achieved such wonders by its means, yet the profit and pleasure that will be their reward, however far they may extend the pursuit, are well worth the trial. That a sense bestowed upon us by the Creator, susceptible of so much real benefit, as well as enjoyment, a capacity belonging exclusively to the human mind, should lie buried for want of cultivation, is a sad reflection—one that well deserves the serious consideration of Parents and Teachers, who are called upon at once to set about the work of reformation. Surely they will not hesitate, when no great sacrifice of personal convenience is asked of them. Let them look back on their own life, and see what they have lost for want of this cultivation; they will see much, but the real extent of their loss they can not know; for, without that faculty of just perception imparted by a knowledge of design, we walk through life as one blindfolded. It may not be too late to try themselves; the germ may yet exist, though long buried and neglected. If the spring-time of life is passed, and the summer is on the wane, it may yet be made to bear some fruit well worth the culture. If nothing more, the trial will prove to them the value of what they have lost by neglect, and they will earnestly look to the better instruction of their children and those under their charge. Instead of interfering with other branches of education, drawing can be made to assist most essentially in their advancement. Who thinks of teaching geography without a map?—and a map is a picture. The world is presented to the mind of a child by the map. To countries, cities, seas, and rivers, are given *forms*; and thus he remembers them. How much more impressive would these forms be, if he were taught to draw them. Pictures and Design may be made, if properly applied, valuable assistants to the teacher in all the departments of learning, from the primer upward—even to the classical and higher studies of our high schools and colleges. The tasks of the school-bench would thus become less arduous, and their benefits more enduring, while a purifying taste would be at the same time a natural result; for it is impossible that a mind, thus trained, should not early be capable of just discrimination, the basis, not only of true taste, but of all that refines and elevates the moral excellence of man.

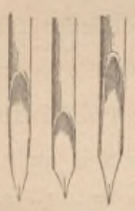
36. As yet, nothing has been said of the materials used in drawing, because it is a matter of little importance what instrument is employed in the beginning. Giotto's stick for a pencil, and the sand for his paper, were as good an outfit as he needed. A piece of charcoal, or chalk,

and the barn-door, have served many as well; while others, who have accumulated a complete magazine of materials and patent nostrums, have done nothing else. The hand and eye that direct it, not the instrument itself, must be the strong reliance of the draughtsman. He should early learn to consider his tools as of secondary consideration, and to supply them as he feels their want and his capacity to use them. Instead, therefore, of giving at once a long catalogue of materials used in drawing, such as are progressively required by the student, will be mentioned in their places.

37. The Pen is placed first, because it may be justly considered the most important instrument for the general purposes of Design, and if its use were properly understood, it would be oftener found in the hands of draughtsmen. It is always at hand, gives a certain and indelible line, and is capable of producing the most finished effects. If all who write possessed the power to express what they desire by design, when the resources of language fail, what a new charm would be added to the epistolary intercourse of friends;—how much richer and more valuable would be the traveller's journal—the lucubrations of the man of science; and the page of poetry would present visions from the world of fancy in all the beauty of their original conception. Thus might this familiar instrument be made to do its full office, if we would only take the pains to acquire a command of it. That one capable of describing a scene, whether of reality or of the creation of the mind, so truly, that another can make a picture from it, could not draw it himself with greater truth, if he had been as well educated in design as in letters, is as certain as, that, if he possessed this two-fold power of expression, he would naturally be led to use each as they could be made in their turn most subservient to his purpose. The author and designer would thus be one; and with the facilities that exist of reproducing and printing designs, as readily as letters, the limits to which the influence of the pen may be extended, are beyond conception.

38. The best pens for fine and finished drawings were formerly made of crow-quills; while, for larger and bolder works, the ordinary goose-quill, and even reed, have been employed. The late improvements in the manufacture of steel and other metallic pens, have, in a great measure, taken their places; and these may be generally employed by the draughtsman, who, by trial, will soon learn which kind best suits his purposes. Many, however, have not the advantages, enjoyed by those who reside in the cities, of a variety from which their selections may be made; and after all, in many instances, they may require to make their own pens; which they should be capable of doing, under any circumstances.

39. The quill should be scraped on the side where the split is intended, first toward the point, and then backward, more or less according to the flexibility of the nib required; then cutting off the ends  , and placing the left thumb  on the spot where you desire the split to stop, which its pressure will effect, start the split slightly with your knife, and run it up the quill by a touch with the thumb-nail of your right hand, or the uncut end of another quill. The general rule is, to cut the shoulders the length of the split, and for writing, it is a good one; but in drawing, it is necessary to vary from it, and to suit the length and shape of the nib to the use for which it is required. The right nib, as you hold the pen, should be a little longer than the other, to produce a delicate line; and often it may be requisite to increase its sharpness, by slightly trimming the point in front, as figured. A little practice will soon teach you, not only to know what sort of pen you require, but to make one to suit yourself, as well as render you capable of exercising proper judgment in selecting steel or other pens.



40. The best Ink, for nice purposes, is Chinese or Indian ink, rubbed down with water, to the proper degree of fluidity, in a small saucer or cup. Some, who are very particular, prepare the burnt tips of candles, collected carefully before they fall in burning, and mixed with gum-water. There is also an ink, of recent invention, in every respect equal to Indian ink, and possessing the advantages of being always ready, and in a fluid state. It is made by Stephens, of London, and called "Mechanical Drawing Ink." It flows freely from the pen, is of uniform tint, and does not corrode or in any way injure metallic pens. It can not fail to prove a valuable material for the draughtsman, if its more general use does not induce a deterioration of its quality. Care should be taken in its selection. Indian ink is always best, when it can be procured as imported direct from China. There is no economy in purchasing an inferior article: a stick of it will last a long time, and is not worse for age. The best quality is generally strongly scented with musk. Common writing ink, for ordinary purposes, and for beginners, answers very well: it should be perfectly black. Metallic, and all other pens, should be wiped clean, after use, and laid away carefully. Pens frequently, by accidental wear, acquire a

peculiarly delicate and serviceable point, that should be preserved, as it will be often found no easy matter to obtain it so well in a new one, when wanted.

41. Sepia is of a rich brown tint, resembling very closely Indian ink, in its working qualities, and flowing freely from both pen and pencil. This pigment is named after the *sepia*, or *cuttle-fish*, which is called also the *ink-fish*, from its affording a dark liquid used as an ink by the ancients. The Roman sepia, prepared in cakes, has the best reputation; and it is rarely met with of inferior quality, — its cheapness leaves no inducement for its adulteration.

42. Black-Lead Pencils are in most general use as instruments for drawing; and are not only valuable, from their convenience, for sketching from nature, but well adapted for highly-finished drawings, being capable of producing the most delicate, as well as the most intense shades and tints. The best sort should always be purchased. The quality of black-lead pencils can be easily tested. When pure, the lead will be found to cut freely on two opposite sides, and harder on the other two. In using such pencils, the draughtsman can, by turning the pencil as he desires, produce a light or dark line. Beginners are generally too fond of using the knife, and often, by its awkward application, sacrifice a whole pencil, before they get a point to suit them. The wood should first be cut away with a sharp knife, scarcely touching the lead  ; and then, instead of cutting away the lead downward, toward the point, which is the common practice, trim it upward, being at the same time careful of cutting away the lead near the wood, or it may be so much weakened as to break off at the first touch made on the paper. A small flat file is a still better instrument than a knife, and should always be used with an upward and very slight stroke. Extremely sharp points to pencils are, however, unnecessary. A practised draughtsman manages to keep his pencil in order, by occasionally turning it so as to preserve it partly blunt for tints, and, at the same time, with an edge for a sharp touch, when desired.

43. The best black-lead pencils in use are those made of pure Cumberland lead, cut into strips, and enclosed in red cedar. When proper care has been taken by the manufacturer, in

assorting the leads according to their hardness, the draughtsman will soon learn to know by their marks the kind he requires. Those marked H, HB, F, and EF, serve best for sketching, general drawing, and outlines; and those marked B, BB, and EHB, for shading; while HHH, and HHHH, are best adapted for architectural designs, and drawing on boxwood for engravers—a subject that will be hereafter treated upon to some extent.

44. There are other inferior kinds of pencils, that come mostly from Germany and France, which serve for many purposes even better than those made of pure plumbago. They are made of a composition that can not be erased with Indian rubber as readily as the others; and, from that fact, drawings made with them are less liable to be rubbed out, or injured in handling. Many object to them on this account; but the less the student of drawing has to do with Indian rubber, and the sooner he learns to do without it, the better. They do not produce such delicate tints and gradations, but, nevertheless, are serviceable. They work best on paper that is rather rough, or that has, what artists call, a good tooth. On unsized paper, such as is used for copperplate printing, they will be found to work admirably. Their numbers, generally from 1 to 5, indicate their degree of hardness. Practice and experience will soon make the draughtsman familiar with their power and use.

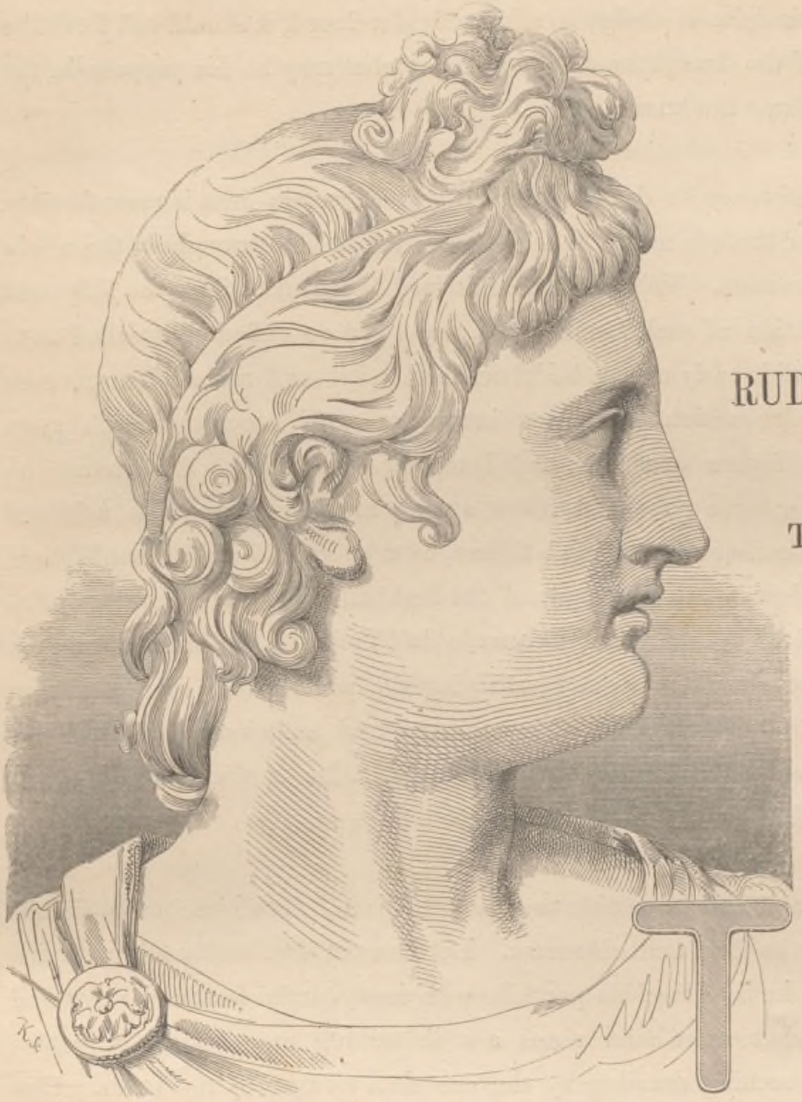
45. A small box, made of paper or some light substance, should be kept on the drawing-table, for the purpose of receiving the cuttings of pencils or crayons. A habit of neatness should be early inculcated. Many a drawing has been spoiled, and the pupil made ashamed of it, for want of proper attention in this particular.

46. THE FRENCH CRAYON is much used in making finished drawings. It can be procured of various degrees of hardness, should be pointed, and used much in the manner of the black-lead pencil. It does not work well on smooth paper, requires a port-crayon to hold it, and can only be erased by a pellet of stale bread—Indian rubber will not do. Its use on tinted paper will be hereafter alluded to.

47. The pupil being now in possession of sufficient materials for commencing the Rudiments of Drawing, the necessity of going to work not too hurriedly is urged upon him. Consider well what you have to do, before you begin. Endeavor to make not a line or touch that is not to the purpose. If you can not satisfy yourself on the first trial, be not disappointed, but try again—and again. Recall to mind the errors you have made in the first attempts; keep them

by you, that you may often refer to them. In your next trial you will do better. You will have advanced a certain step; and onward will be your progress, as surely as you persevere. Never fatigue yourself over your drawing. The moment you work without a will, it should be laid aside.

48. Last, though not of least importance, let it be urged upon the pupil early to acquire a good position in drawing. It should be easy, and in no way painful to the chest. There is no necessity for leaning over your work in an ungraceful or painful attitude. The eye should be, as nearly as possible, directly opposite the centre of your drawing. It is unnecessary to give directions as to the manner of holding your pen or pencil. Your own judgment must direct you as to that. It matters little, so that you feel the instrument fit your fingers easily. If proper attention has been bestowed upon the primary instructions given, you have already learned the importance of depending, not solely on your fingers, but also on the action of the wrist and arm. The hand should not be suffered to rest on the paper on which you are drawing, if it can be avoided; but have a spare piece to lay under it, while at work. It will serve another purpose—to try the points of your pens, pencils, crayons, or tints upon. Begin at once your portfolio. Even when you have failed in any attempt, you should keep it by you. Destroy nothing that you do, and you will soon learn to do nothing you would desire to destroy. Preserve order in the disposition of all your materials: much time and vexation may be saved by it; and, above all things, remember, WHATEVER IS WORTH DOING, IS WORTH DOING WELL.



CHAPTER II.

THE

RUDIMENTS OF DRAWING

THE HUMAN HEAD.

— If we wish to ascend to the top of an edifice, we must be content to advance step by step, otherwise we shall never be able to attain it."—LEONARDO DA VINCI

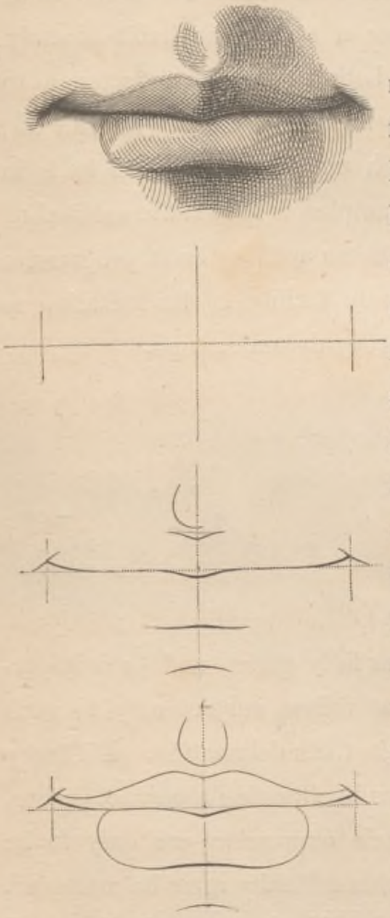
THE first impulse of all beginners is to attempt the delineation of the human face, and generally as seen in profile, because it is easier thus to express the actual form of the features;—and, there is no object in nature on which the early efforts of the student of design can be more deservedly and profitably bestowed. In nothing else are combined so many elements of beauty and expression, such established and well-defined principles of form, and happy adaptation of that form to purpose—in short, such perfection of Design—and he that can draw the head with accuracy and knowledge, in all its details, is a master of the art. As a general standard of beauty and expression, the conception of man reaches to nothing beyond it. In his dreams of angels and beatified spirits he can go no higher, and the demons of the imaginary world bear its impress, however distorted or debased. Always before us, always subject to our scrutiny and observation, always exciting a deep interest and best remembered of all other objects, possessing

in itself the great and leading principles of design so admirably developed, it should call forth the earliest and most devoted study of the draughtsman. No matter what may be his purpose in the study of design he must learn to draw the human figure.

50. What has been said in reference to drawing curved and eccentric lines is most forcibly applicable to drawing the figure, for there is not to be found one straight line throughout the whole wonderful structure of animated creation. Without some standard by which to form the judgment and direct the hand in the delineation of such forms, which are often so delicately marked as to escape the notice of the student, in his early efforts, he labors in the dark, and more often succeeds by chance than by that knowledge which alone can insure repeated success; which gives continually-renewed strength for higher exertions, and leads surely onward. On chance no reliance should be placed; it may serve once and never again; and a success thus achieved often brings with it more injurious consequences than a failure, by creating a fictitious confidence, from which we are unwilling to descend to the study of the first principles, the grammar of the art. Let the student be reminded of the maxim of Leonardo da Vinci that, "in order to acquire a true notion of the form of things, he must begin by studying the parts which compose them, and not pass to a second till he has well stored his memory, and sufficiently practised the first: otherwise, he loses his time, and will most certainly protract his studies—and let him remember to acquire accuracy before he attempts quickness."

51. It is not enough that the pupil should be able to draw an object before him, but he should understand and learn to remember its form and character. Let him not deceive himself with the idea that he is doing much when he is filling his portfolio with hasty, unfinished, and unstudied sketches. Sketching is to art what short-hand notes are in writing and equally valuable; but we should no more think of teaching drawing by the one than writing by the other. One single effort executed with care and study is worth all the time and labor bestowed upon it, and will in the end more surely promote his certain advancement. It is for this reason that the pen is so strongly recommended as the best instrument for the beginner. Its use may present difficulties, at first, but he who is earnest in his desire to become a proficient draughtsman, may rest assured that this commonplace instrument can do him more good service than any other. The precision and facility of hand and certainty of touch that he will acquire by its early and single use will enable him to wield the crayon or the brush, the graver or the modelling tool, the chisel or the hammer, hereafter, with a command that will amply repay the labor of his present efforts to become familiar with it. Is his hand tremulous and disobedient to his will, the pen will

make it firm and well-trained; and nerved to its use, he will possess an unlimited command of all other instruments. The pen admits of no indecision. We are compelled to consider well what is to be done, and then to do it with an unerring line or touch—and a failure can only be remedied by retracing our steps and another attempt. That failure is a lesson not soon forgotten, and many such will soon induce a habit of accuracy which is rarely acquired through the tangled confusion of lead pencil and Indian rubber. What is done with the pen can be done again, and there lies one of the great secrets of excellence in design.

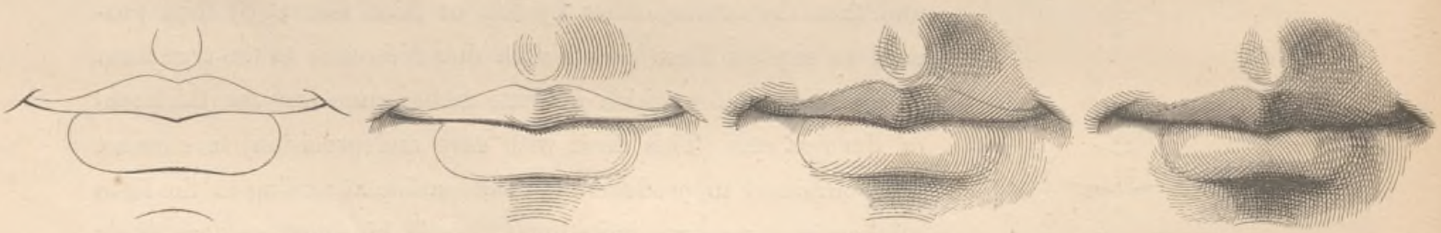


52. As the easiest to draw, and that which, probably, will show most clearly to the pupil the principles upon which he must rely for accuracy, let him begin with a full or front view of the Mouth; and before making any attempt at expression he should become familiar with the actual form of the features, and be capable of delineating them knowingly. The first thing to be done is to get the beautiful line produced by the meeting of the lips. On a straight line first indicate the width of the mouth, and then the centre, either by dots or faint lines; (8) then proceed to express these points with due reference to the true form of the object; after which indicate in the same way the thickness of the lips, etc. This done with care and precision, to connect the points and to produce a correct outline according to the form of the object you are imitating (22) will be found comparatively easy; and with a correct outline you have a sure foundation upon which to proceed in the completion of your drawing. Before advancing farther, however, the trial should be repeated, until the pupil is able to dispense with the straight lines and to produce an outline without their assistance, beyond their imaginary existence, by which he will soon learn to preserve the proportions and the relations of the parts as readily as if they were drawn on his paper. This step at off-hand drawing, should be carefully taken, practised, and studied; for the same method and principles are applicable to the correct delineation of all objects. Should the pupil grow weary in his efforts to attain a correct outline in this example and feel discouraged by repeated failures, let him as a relaxation try the outline of any one or more of those that follow, without attempting to express the shadows. With many this page may be remembered as one of

toil, but according with the recollection of it, will be the ease or difficulty of their progress hereafter.

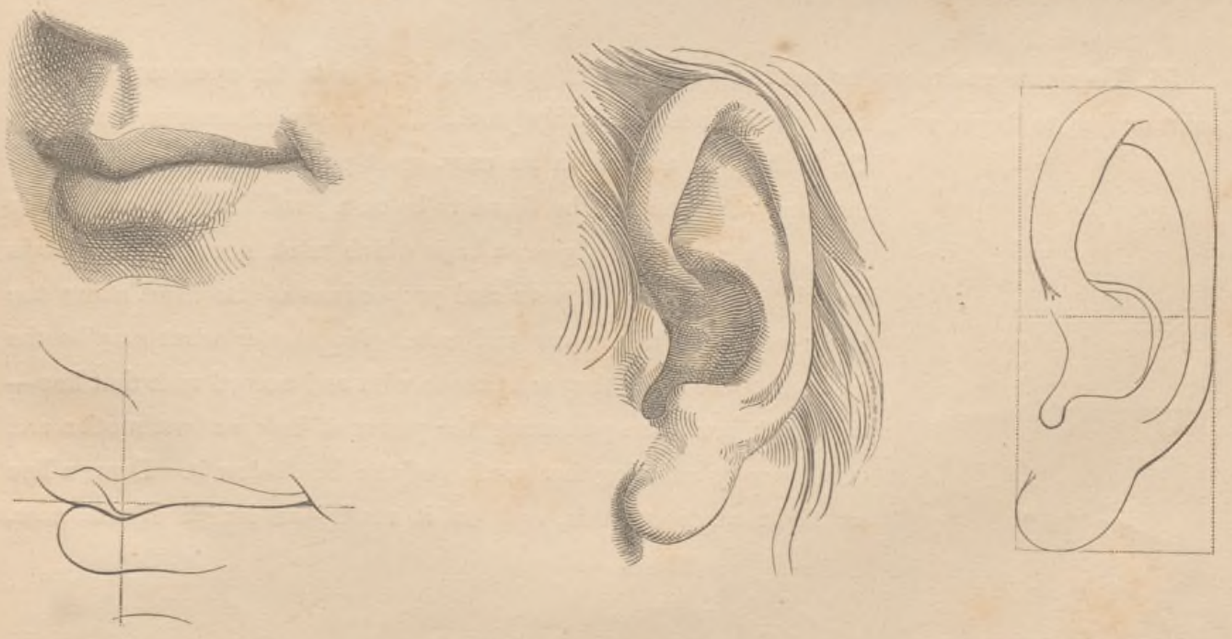
53. Having succeeded in becoming proficient in drawing a correct outline, next proceed to express the shadows that give rotundity, and farther develop the form of the mouth. Begin with

the most distinct and prominent markings; they will serve as a basis upon which to elaborate and express more minute detail and finish, as well as to make you familiar with the actual formation of the object of imitation, and induce a systematic habit of study as well as execution, which are both of much importance to beginners. With regard to expressing tints by lines, what has been before said (13 and 19) may be recalled to mind, and the pupil should not attempt to finish up a drawing, until he is in a measure perfect in each progressive step. In the following examples, is shown the method of proceeding gradually with a drawing, and it is advisable that this, as well as each progressive example, should be practised over and over again, until not only facility in its imitation is attained, but the method by which that imitation is produced is thoroughly understood.



54. The directions with regard to this example have been thus fully given, and their importance especially urged, because of their application to those that follow, subject only to such variations as the peculiar form of the different features may require in their delineation. Difficulty may be felt, in the first attempts, in expressing the shadows, as well as in obtaining a correct outline, as the delicacy of hand and precision of touch requisite to their expression, are only to be acquired by care and practice. To become a good draughtsman this difficulty must be mastered, and it must be done now—in the beginning—when it is less formidable. Should the pupil in his anxiety to go forward, find it irksome to devote the time and patience to these rudimental studies that may be required, he may rely upon it, he will soon find himself involved in greater difficulties, from which it may not be easy for him to extricate himself. This injudicious hurrying forward has done much harm to education in design, by bringing disgust rather than delight in its pursuit. Never leave a difficulty behind you that you have not overcome, and those that lie before

will be no longer formidable. Presuming the pupil to be in earnest in the business, and anxious that he should early learn to rely somewhat upon his own judgment as well as intelligence, let us place before him the following examples in delineating the features, which he should carefully study and learn to draw, with some degree of facility, before he attempts to combine them together in the perfect head. To the principles of Design, of Form, of Grace, and Beauty, developed by the human figure, and especially the head and face, frequent reference will be made hereafter; and unless proper care has been bestowed upon the study as well as practice of these examples, the learner will find his progress continually impeded for want of that elementary strength and progressive knowledge necessary to secure success in more advanced studies. The straight lines, given to assist in drawing the outlines, may be drawn with a lead pencil (43), which, after the outline is secured by the pen, may be erased with Indian rubber. Again, let it be impressed upon the pupil, that the sooner he learns to do without these straight lines, drawn on the paper, the better, but their application and use should never be overlooked or forgotten.



55. To enter into the minute detail of the proportions of the head and features, according to the most received standards, would be of little benefit to the student until he is farther advanced. A few leading principles will be sufficient for his present purposes. Nature, although confined by no mathematical precision, and producing the infinite variety of countenance, character, and expression, by enlarging and diminishing as well as varying the form of the features, has supplied, in her most perfect productions, a standard of proportion useful to the draughtsman, not only as assisting in the delineation of correct and beautiful forms, but also in such as are exceptions. A standard of form once impressed on the mind, we soon learn to measure all deviations by it, as we learn to measure the variations of curved or eccentric by straight lines (20, 21). Thus may the eye be educated not only to fix upon the most prominent and characteristic peculiarities of a head, at once, but the impression will be so vividly preserved upon the memory that it may be recalled and delineated at any moment, with a degree of facility as surprising to the uninitiated as serviceable to the possessor. Nor is this principle of design alone applicable to drawing the head. It extends, as a general and practical method, to the delineation and preservation in the memory of all other objects, besides assisting in the cultivation of taste and that keen perception of the beautiful, which not only open to the follower and lover of art such inexhaustible resources of enjoyment, but have a purifying influence in the direction of his efforts to high and noble purposes. As we measure the degree of deformity by beauty, so a high standard of beauty has been attained by avoiding deformity. Thus the great artists of antiquity produced those exquisite and beautiful forms which perhaps were never found combined in any one living individual, and yet these forms were ideal only in their combination. Without the closest study and the keenest perception of the beautiful in nature, only to be acquired by that study, they never could have been produced.

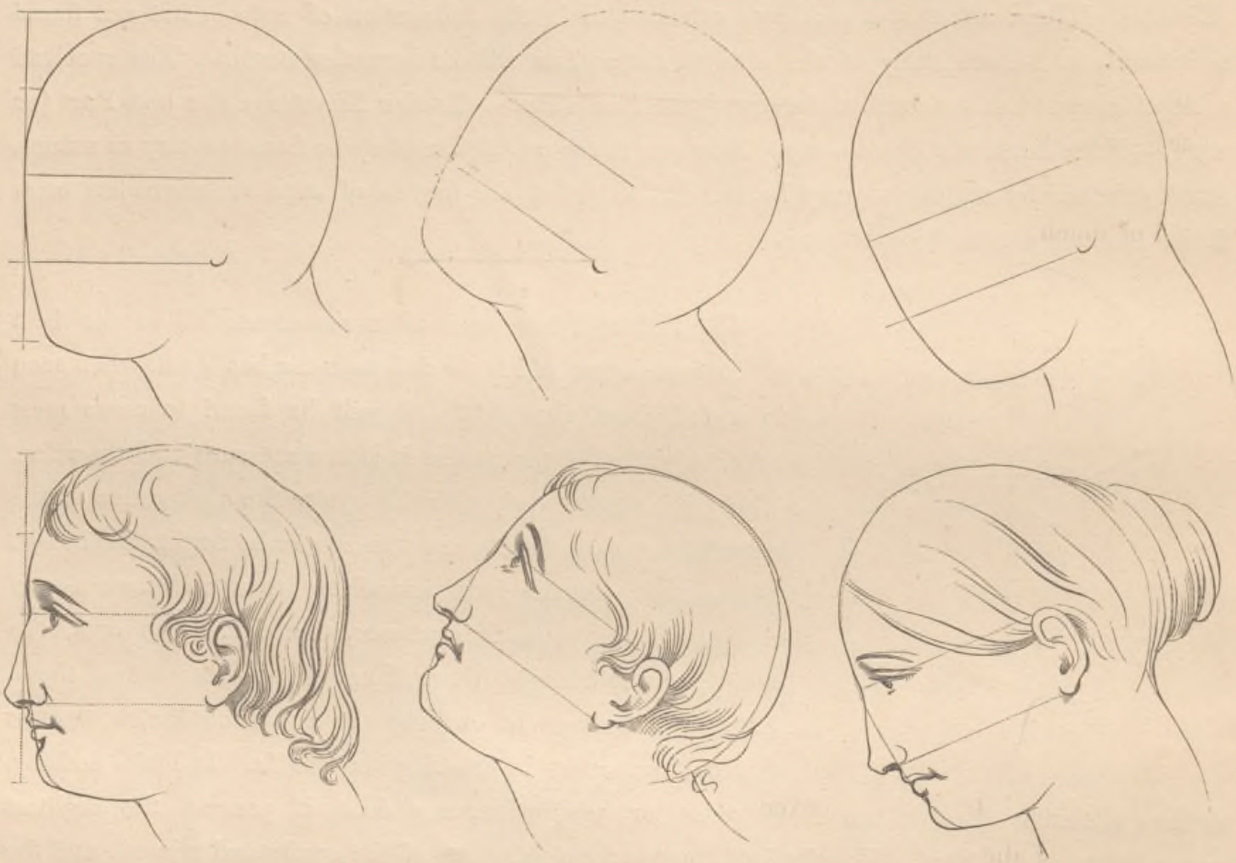
56. To DRAW THE HEAD IN PROFILE, the first thing to be done is to fix upon some certain point or line to begin with, and one is most admirably provided by nature, of unerring certainty.

On looking at a head in an easy, erect position, the lower points of the nose and ear will be found to be on a level. A line connecting these points, therefore, gives a basis which must necessarily maintain its relations to all the parts and proportions of the head, above the lower extremity of the ear and nose. No matter what may be the position of the head, they must move with and accord with that line—the lower jaw alone possessing the power of independent motion and consequently affecting that portion of the face below it. Draw a line at right angles to this, and on it mark the length of the nose,

which is generally about one fourth the whole height of the head, and you have a standard or scale by which not only the proportions of the head may be ascertained, but those of the whole figure. The head is considered as containing in height four measures of the nose—and, that greater accuracy may be obtained, the nose is subdivided into twelve Parts, usually called *Minutes*. These minutes are seldom attended to in the delineation of nature, but are found serviceable in minute study of the antique statues, as will be hereafter shown. The received scale of measurement, therefore, for the figure stands thus—Twelve Minutes make one Part (or nose)—Four Parts one Head—etc. However these proportions may be found to vary in nature, some standard by which we may be enabled to define the degree of such variations has been found of much practical importance.

57. The oval has been often recommended as the best given form upon which to delineate the head, and when seen in a full, front view (64), it will be found to serve most admirably, but in the profile it is in a measure of little value. The pupil should early train his eye to the observation of the general forms of objects, and the sooner he begins the better. When that general form assimilates to a well-known and recognised shape, as for instance, the circle, the oval, the square, or the triangle, it is well enough to make use of them, but it will be seen at once by the above outline, how little the oval can assist in drawing the profile. It limits nothing, defines nothing. It gives no fixed point or proportion, nor does it present the slightest general idea of the head. Equally inefficient is the application of the equilateral triangle and the square; and after all, if the learner can not be taught to do without such mechanical aid in drawing, even in his early attempts, he will never attain proficiency in the art. They are necessary more as correctives, as the means by which he may, with the exercise of proper judgment, supply the want of a teacher, to tell him when he is doing wrong, and direct him in correcting his mistakes, maturing his judgment gradually for higher efforts, and clearing from his way all mystery in the pursuit of knowledge in design. It is not to be understood that the various methods and principles that have been long inculcated, in many cases by high authority, should be disregarded; they may be all good and serviceable to a certain extent, but they often tend to confuse rather than assist the learner in his first efforts. He becomes alarmed at the difficulties in which he is involved, finds the pursuit one of toil rather than pleasure, and gives it up in despair.

58. With the line designating the position of the ear and nostril, a general outline of the head and the general proportions marked out, but little more remains than to express by well-defined and decided touches the characteristic features and more minute details.



59. It would seem in place and proper before proceeding farther, to enter into an explanation of the anatomical formation of the head, especially of the bones, and it is almost impossible to proceed far in the delineation of the human figure, without reverting to the wonderful machinery that gives it life and action. But, it is not well, at this stage of the pupil's progress, to enter upon a study that he will pursue with more earnestness and greater profit hereafter, when he has advanced far enough to be more sensible of its absolute necessity. He has now to learn, not only the rudimental principles of design, but to acquire a facility in the use of the pen or pencil that can only be obtained by practice, and an increased and increasing love for the art, which will bear him onward successfully, and sustain him through any difficulty that he may encounter.

60. Many have been deterred from learning to draw, by the formidable array of studies that have been unnecessarily placed before them; these should never be in advance, but always, as far as possible, progressive with a certain degree of capacity both of eye and hand. The judgment and power of execution being thus matured together, their growth is healthful and gives certain assurance of success. Let the pupil, therefore, try his hand in drawing the above profiles or any others more suited to his taste, to which he may have access. Let him practically apply the principles laid down, and if he does not succeed in producing a fair copy, he may rely upon it he has gone too fast, and before proceeding farther should retrace the ground he has passed over. A more finished example in drawing the profile, and on a larger scale, may be now attempted.

61. Let it be remembered that a drawing, incorrect in outline and the just proportions of the parts, can never be said to be finished, however great the labor bestowed upon the elaboration of its details. Care should be taken, therefore, that these important points are well determined first: and thus much lost time and many disappointments will be avoided. First obtain a general idea of the object which you desire to draw. Then arrange its proportions into an harmonious outline—Study it

well;—see that all the prevailing lines correspond to the form, character, and action of the original. That done, you have a sure groundwork upon which you may proceed with safety, and all the labor bestowed upon it afterward will be to the purpose. This principle will be found of general application in design, from the minutest object to the most extensive composition; and yet we must possess knowledge of the details to form just ideas of the whole. You can not begin by drawing a foot and erect on it a perfect figure, although without the capacity to draw and finish that foot, you can not form a just idea of its true position and relation to the whole figure. First make yourself proficient in details and particulars—then learn to connect these particulars into an harmonious whole, to understand the power and propriety of their combinations, and you are prepared to generalize, and to descend from generals to particulars, in the execution of your drawings, pictures, models, or designs.

62. In drawing the outline of the second profile, it should be remembered, that the parts of the face covered by the beard, should be slightly indicated or at least defined, or you can never with accuracy express those that do appear and preserve all the proportions, action, and harmony of the parts. The importance of the application of this method will be more forcibly shown hereafter. In this instance it may seem of trivial importance—but still it is of importance and

should not escape the observation and attention of the learner. He should look not only to the appearance of objects, but also to their actual form. It is thus, and thus only, that he will acquire the eye and hand of a master in the art, and avoid that feebleness and indecision which mark the touch of the uneducated; who may labor and elaborate as they will, yet never reach the truth and expression that seem but the momentary, spontaneous, impulse of his mind and hand. This should be the high aim of the follower of art, and should he grow weary over the means required in its attainment, let him be encouraged to persevere, in the certainty of success that awaits his exertions. Above all things, let him not attempt too much until he acquires strength. His steps should be slow and sure. The desire of advancement is wholesome in art, as in all other pursuits and studies, but should be restrained within proper limits. Let it be cherished and kept alive as an incentive to that preparation requisite for high achievements. Success in humble efforts gives strength for higher, while continued failures tend to break down and crush the spirit.

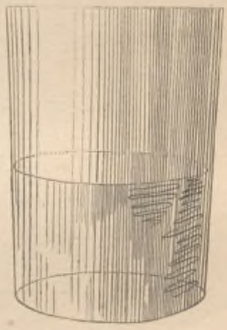
63. It may be found more difficult for a beginner to draw in large than small, yet, if the limits of this work would allow, all the examples given would be better if they were of the full size of nature. The profiles which have just been presented to the pupil, demand the exertion of his utmost capacity, and they should be drawn, not only as they are, but also reversed, which is recommended as the proper course of practice with all the examples that have been, or may be given hereafter.

64. However inappropriate the oval may be in drawing a profile, its application in a full or front view will appear by a moment's observation. It strikes at once the prevailing or general outline, whether it be that of a youthful or aged individual. It should be understood that the regular and mathematical ellipse, generally called an oval, is not here meant, but the true oval or egg-like form — one familiar to all, and easily remembered. The same governing lines and general proportions, that are applicable to the profile, apply also to the full or front view of the head and face; and according to the degree of diversion of the lines and proportions in the original from these, can we determine their true position and delineate them. It is easy to decide, in assuming the form of an egg to represent the general outline of the head, whether that form be more or less obtuse or elongated, according to the peculiarity of the original we desire to represent, as well as the proportions occupied by the individual features; and the degree of variation once decided with regard to the original object, the pupil has gone over the instructions already given to very little profit, if he can not express them in his drawing with readiness.

65. The moment the head is thrown backward or forward, and the lower extremity of the nose is thereby thrown above or below the lower extremities of the ears, the base or governing line, drawn

through these points ceases, necessarily, to be a straight line, and according to the degree of elevation or depression of the head, is its degree of variation and curvature. It is still, however, the governing line for the true position of the features, which must harmonize and agree with it upon the principles already inculcated with reference to drawing the profile.

66. Until the pupil has acquired some knowledge of perspective, he can not be made thoroughly to comprehend the delicate variations of these lines in their relation to one another, and although it more properly belongs to that study, a simple principle may be here introduced to his notice. Take an ordinary glass or tumbler, half full of water; hold it up before you, until the line of the water is on a level with the eye—it presents then a straight line. Observe the lines of the brim and bottom of the tumbler—they are both curved. Then bring the brim on a level with the eye—it is a straight line—while that of the water presents a curve and that of the bottom a still greater. The farther the glass is removed from the eye, the more these curves diminish or approach straight lines—until at the distance of six or eight feet, their curvature is scarcely perceptible—Still the actual lines of the brim, the water, and the base, are in fact parallel to each other, although the tumbler can be placed at no distance or in no possible position in



which they will so appear to the eye, or in which it would be allowable so to represent them. All this does not affect the principles which it is now the object to inculcate. Hereafter these nice distinctions will be better understood by the pupil, as he will soon, if he does not already, feel the impossibility of advancing far in the study of Design without a knowledge of perspective, which must shortly occupy his attention.

67. In a three-quarters view of the face and head, the oval is often made use of, but with much less advantage than in a full, front view A desire to fix upon some one form by which the outline of the head may be generalized, has led to the adoption of the oval, and if it were absolutely necessary that one arbitrary form alone should be used, a better could not be devised.

It should be applied, however, with judgment, or it may lead to error and prove a deceitful guide. When drawn on a flat surface, the moment the view of the head inclines to the right or left, the centre or perpendicular ceases to be a straight line, and increasing in curvature, loses its true position as a middle or central line for the features, while the oval itself is gradually lost in regard to the true outline of the head, until the movement reaches a profile, and it becomes in a measure useless. Were we to follow this central line in its movement, under such circumstances, and assume it as indicating the middle point of the features, distortion would inevitably be the result. The draughtsman should look to something more accurate and unerring. Even in the next outline, although the head is, as it were, forced into the oval, and the curve indicating the middle point of the forehead and mouth adapted to it, the whole seems rather an affectation of method than a practical application.

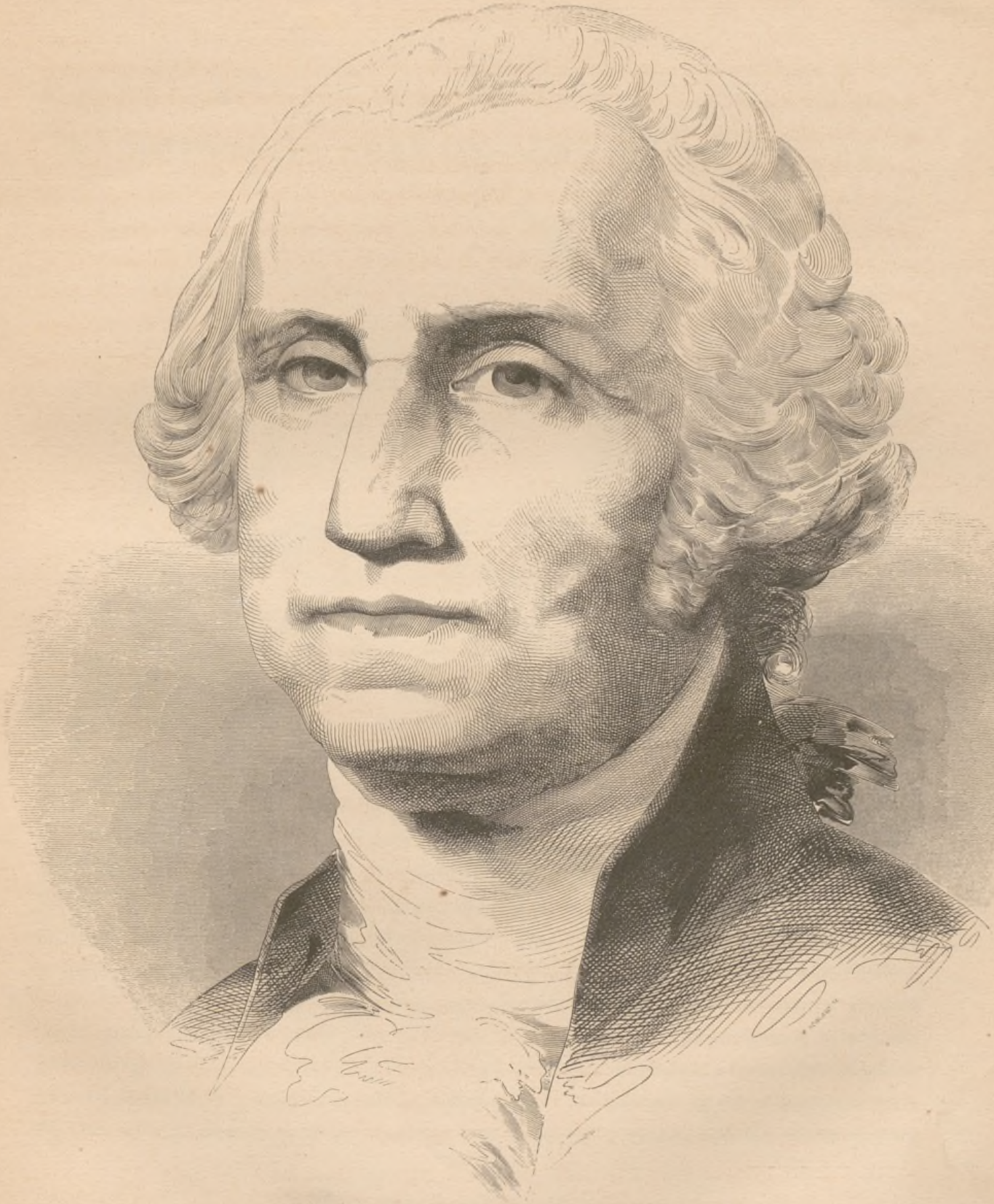
68. The imaginary central line of the face and head, is of as much importance as any real line presented to the eye, and should be as carefully studied and defined. It will be found not only serviceable in assisting to determine the proper position and balance of the features, when drawing from a picture, print, cast, or other still representation of the living head, but highly important in drawing from nature, especially when we have children or restless subjects for models. The great difficulty and annoyance, so often experienced by artists in this respect, might be avoided, in a great degree, if this central line were more carefully studied. It directs at once to the general character of the head, without which no perfec-

tion of individual parts will ever produce resemblance. It is by a general impression that we know and recognise acquaintances, and see resemblances even at a distance. This,—not the abstracted detail of parts, the precise line of a lip, or the tint of an eye,—is fixed upon the mind and governs its conclusions. It must not be understood that these peculiarities should be neglected, but that they should not be suffered to engross the attention of the draughtsman, to the neglect of more important principles—more important, because without proper attention to them, the labor bestowed upon detail will be to little profit. As evidence how much more strongly general impressions of form are retained upon the memory than minute peculiarities, how often do we hear disagreement between persons as to certain peculiarities in those with whom they are in the habit of daily intercourse. One will contend, that an absent friend's eye is black, another will insist that it is hazel, a third that it is blue, and when the matter is settled by the presence of the individual, it is found they were all wrong, and yet neither party would fail to recognise their friend as far as they could see him.

69. As a profitable exercise for the study and understanding of this principle of design, as well as of all those urged upon the attention of the pupil in this chapter, let him take a good plaster cast of a head, and on it draw a central line, from the parting of the hair to the extremity of the chin; let him also draw a line touching the lower extremities of the ears and nose, others parallel to it passing through the eyelids, eyebrows, and mouth, and lines from the inner corners of the eyes to the mouth, parallel with the central line. These governing lines defining the positions and proportions of the features will then appear, in a three-quarters view, similar to those indicated in the annexed outline, and there is no better practice for a beginner than to draw from a plaster cast thus marked. He should place it in every possible position, and draw it carefully; making use of these lines as guides by which to define not only the true position and form of the features, but to accustom his eye to the close observation and understanding of the principles that must govern him in the delineation of the head. After some practice in drawing and familiarity with a cast, thus marked, he may make a trial on one without the lines. Drawing from casts is an important exercise, as casts afford greater facility for careful study and observation than

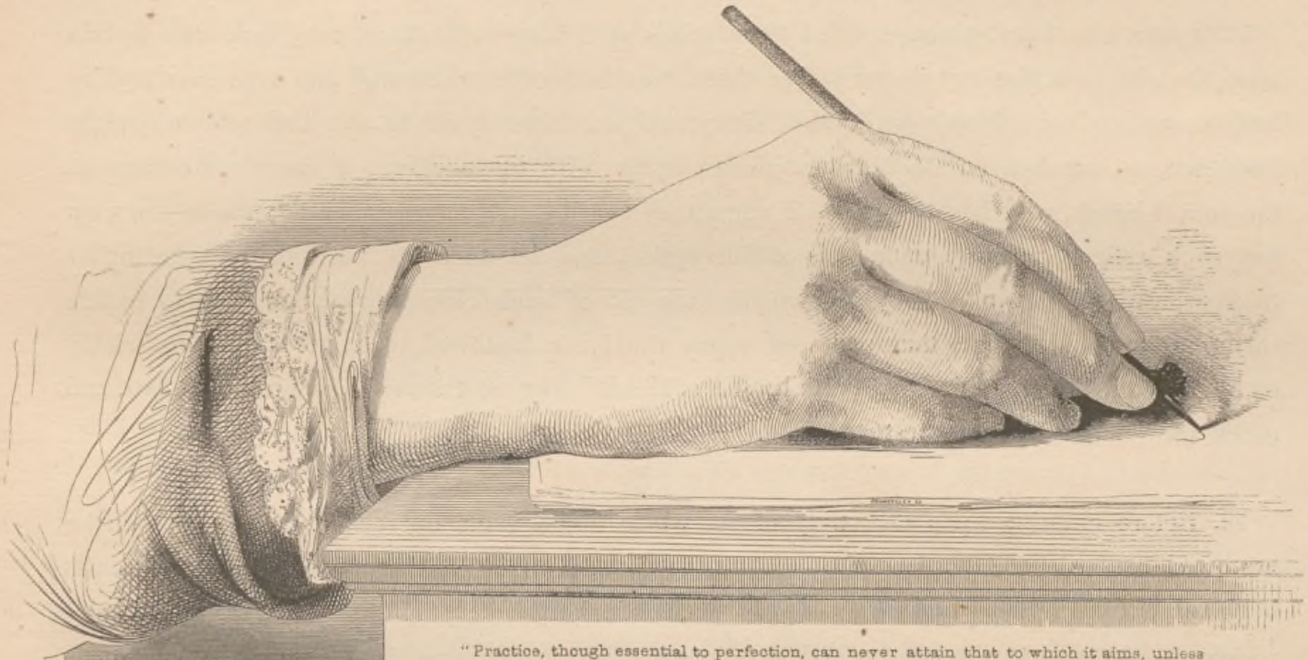
living models, who are constantly changing their positions, and thus embarrassing the unpractised draughtsman. In schools and classes, it is recommended that a small collection of good specimens, not only of heads, but of hands, feet, limbs, etc., should be made, for the use of pupils. Those who pursue the art by themselves, should at least have one or more good copies from the antique, which can be readily procured, and at a very cheap rate, in any of our cities. In drawing from them, they should always be placed or remain in the same light during the progress of a drawing. Whether the subject of imitation be a cast or living head, the same principles and method will be found applicable; as the former presents less difficulty, it is the better to begin with. Before a touch or line is made, you should study well the original before you, and define its position and movement; make yourself familiar with its character and peculiarities, balance all its proportions, and carefully adjust the relation of the parts to one another; and, as all important with the rest, do not lose sight of the value of a correct central point for the features, for it is your surest reliance. Once obtained, it affords a key to the truthful delineation of the head and features, and with proper care and attention secures the utmost certainty in preserving the harmonious agreement of the parts. Many sketches and drawings, by those who have been most distinguished as masters in the art, might be referred to, to show their familiar use and application of this method, which with a little practice and observation, will be soon understood and appreciated by the pupil.

70. It should be understood that the study and practice of pupils should not be confined to the examples given in this work. There are many admirable specimens well worthy of their study and imitation, which may be readily obtained, and all that has been thus far said, has been to little purpose, if they are not already capable of exercising proper judgment in selection. One thing can not be too strongly impressed upon them: It is more important to acquire a knowledge of the principles of art, than a mere facility in the imitation of the *manner* of another. Many falsely imagine when they can "make a drawing to look like an engraving" to the uneducated eye of partial friends, they are doing great things in the way of art, but it is a sad mistake. Let them learn the first, great principles of design, and then that best of all Drawing-Books, the ***Book of Nature***, is open and intelligible to them, its pages full of beauty and endless as the enjoyment and profit they afford.



CHAPTER III.

RUDIMENTS OF DRAWING.—THE HUMAN FIGURE.



"Practice, though essential to perfection, can never attain that to which it aims, unless it works under the direction of principle."—Sir Joshua Reynolds.

WITH some the method of learning to draw, thus far developed, may have proved long and even tedious; while to others it may have been too rapid, and their advancement, in its practical application, may not have equalled their expectations or wishes. The former should not be disheartened because their hand and conception have not kept pace with their teaching, nor the latter deceive themselves by hurrying forward too rapidly,—or fail to understand, thoroughly, and to apply practically, every principle laid down. The purpose of the American Drawing-Book is not to teach the methods of drawing trees, houses, faces, figures, or flowers, by separate recipe, nor to direct the learner by short-cuts to the attainment of proficiency in any one branch singly; but, to place before him the broad principles of Design, a knowledge of which, with the power of its practical application, will qualify for the exercise of all, or any one branch, that the taste or inclination of the possessor may lead him to pursue; and the course of study

advised is sincerely believed to be the surest and most direct to the attainment of that object. It is no experiment, but one that has been well tested and proved, claiming no novelty, beyond its adaptation to the wants and purposes of our time and country, divesting the art of all mystery, and placing it within the reach and comprehension of every one.

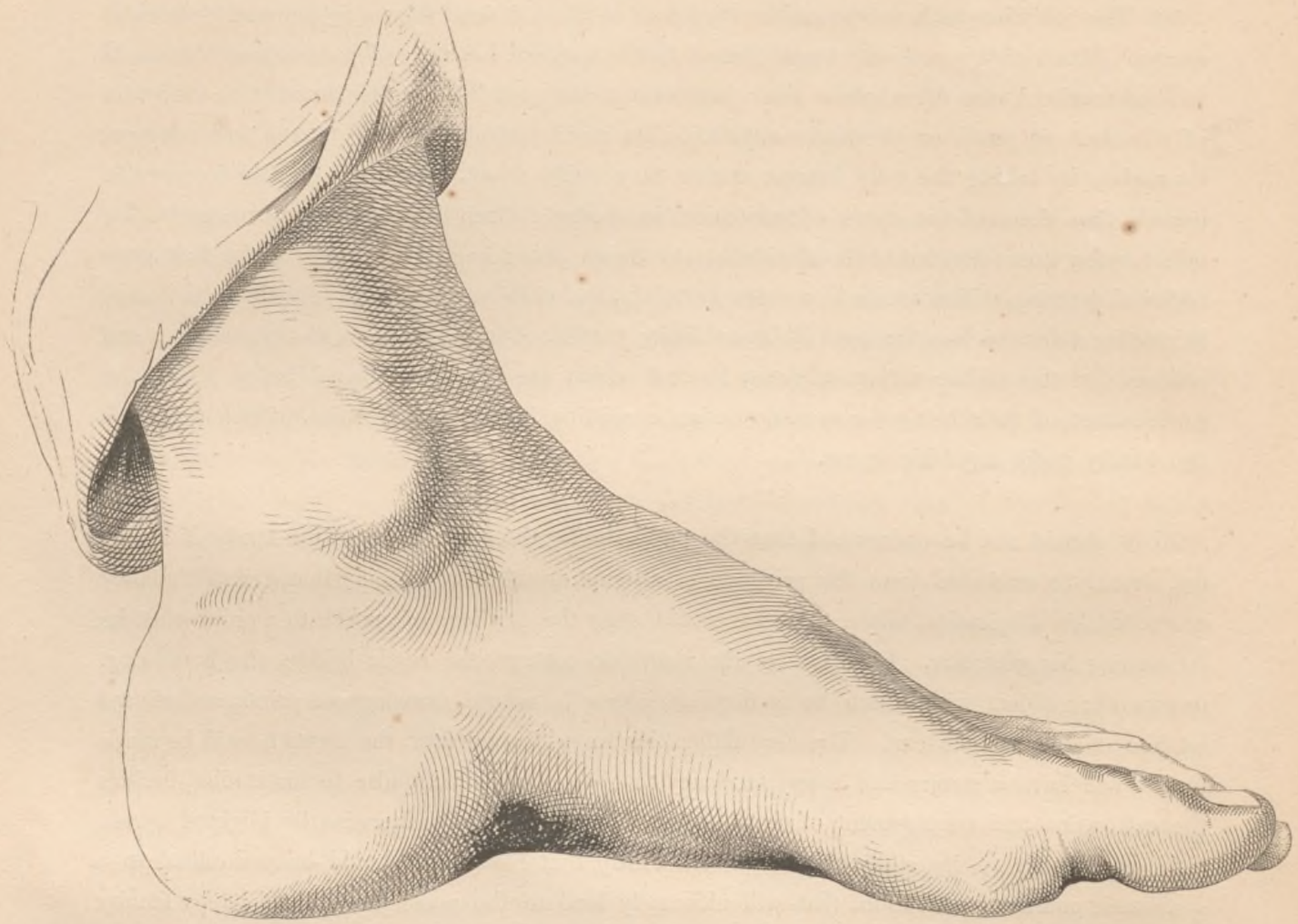
72. Some who have, perhaps, filled their minds with high aspirations, may look with disdain upon the simple beginning placed before them, "as matters for children," and turn over leaf by leaf in search of something to strike their fancy, and yet, they may not be able to draw two straight lines, nor two crooked ones either, to a given purpose, with the accuracy of many an urchin on the school-bench, who has only started when they considered themselves already far on the way. Let such reflect seriously upon this self-deception, and let them be assured, that the higher their aspirations, the more they will require the aid of such elementary knowledge to realize them. It is a short task, that will well repay the labor bestowed, even to those most richly endowed with the gift of genius; for by such aid will they most surely develop that genius, and reach the goal of their highest ambition.

73. Before entering upon the study of the whole figure, some degree of attention should be bestowed upon the delineation of the hand and foot; both of which present difficulties to the beginner, and from these very difficulties, are well calculated to strengthen that general capacity which should be his aim, and which is an essential qualification in a draughtsman; more irregular and less balanced in their parts and proportions than the head, the pupil is compelled to rely more upon his eye and judgment in ascertaining the modulations of their form and outline, the proportions of the parts, and their relation to one another. But, if he has carefully studied and practised one of the first and most simple examples placed before him (32), he possesses the understanding of a principle from which he will derive much assistance. If he has not hurried forward too rapidly, and has bestowed proper attention upon what has been already urged, in reference to the delineation of the individual features of the head, he will soon find the difficulties encountered, in his first attempts in drawing the hand or foot, gradually lessened, as he becomes familiar with the application to them, as to every other object, of one of the first and leading principles of design (21). If he is not already, he will soon be convinced that the time and study this knowledge has cost him have been well bestowed, and that he has done better, and advanced more surely, than if he had filled his port-folio with what might seem higher attempts; but, from which he would have derived but little permanent advantage.

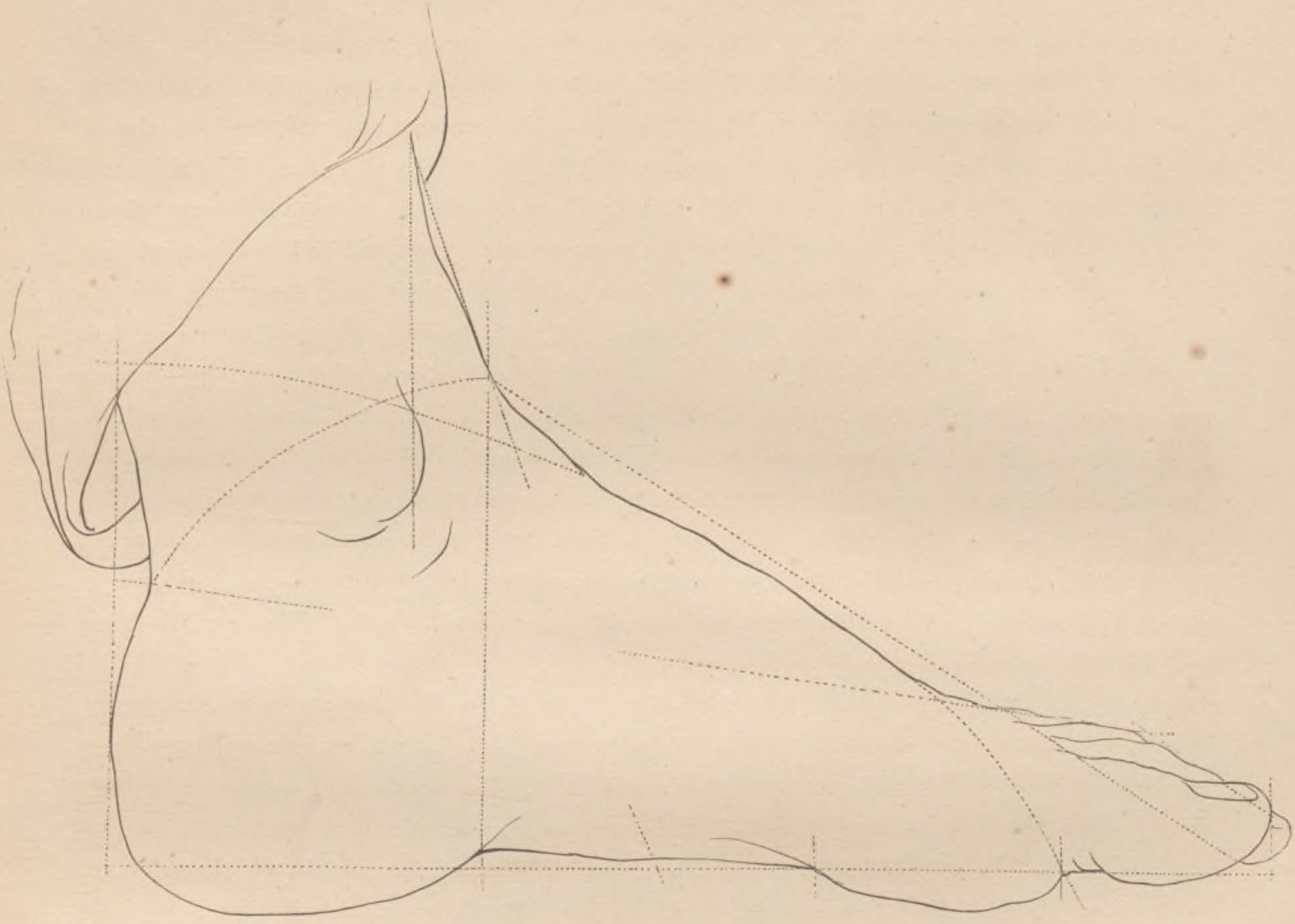
74. The ambition to have "something to show" is apt to mislead from a proper and systematic course. Much of this evil may be attributed to the misguided anxiety of parents and friends, as well as teachers, who often allow their judgment to be overcome, either to indulge the whim of a parent or pupil, or to gain a reputation as rapid instructors. They even here deceive themselves by taking the very longest course they could adopt. Such teachers do far more to impede than forward the cause of education in design. Even if rapid advancement be the object, a few hours devoted to the elucidation, to the understanding of the pupil, of the first principles of drawing, will advance him more certainly, and rapidly, than weeks and months wasted in groping a devious way through ill-drawn fancy castles, distorted heads and figures, trees and bridges, and the endless variety of "easy lessons" which are too often placed before him — the great secret of their being "easy to do" often consisting in their being so decidedly bad that he can hardly make anything worse.

75. It should not be understood that the pupil, during the prosecution of the study of Drawing, should be excluded from the privilege of attempting to draw anything that strikes his fancy or excites his admiration, more than we would deny the privilege of speech to a child while he is learning his grammar. Let him try the road-side cottage, the rustic bridge, the house-dog, or any other object with which he is familiar, either in nature, drawings, or prints, and always let him do the best he can. The very difficulties he will encounter, the wants he will be made to feel, will have a strong and happy tendency to give additional impulse to his studies, besides the cultivation and development of that love for art which might otherwise be blighted by too rigid application to its study. It is in this *study* that his efforts should be prescribed to a systematic course of education, that will ultimately lead to the possession of that happy faculty which will overcome all difficulties, and enable him to draw, with equal ease and facility, any object in nature, or of the mind's creation.

76. The Foot is by no means so facile in its movements as the hand, nor capable of such great variety of attitude and action; hence it is easier to draw, and, therefore, more properly, should be placed first before the pupil. He will now have occasion for the exercise and practical application of the principles laid down in the primary instructions he has received; and should he find the difficulties he encounters try him beyond his strength, he can not do better, before he proceeds farther, than to make a careful revision of the ground he may have passed over too hurriedly, or without bestowing sufficient study and practice upon these primary exercises.



77. However admirable and perfect may be the antique statues in their proportions and details, and however desirable it may be to place before the pupil the choicest models for the exercise of his skill, it is enough for his present purposes to look to the familiar objects which are within his reach. A boy's foot can be found without seeking it in an academy; and, if it has not been already distorted by the shoemaker, affords a model well worth his study and best effort. First, let him try the example here placed before him, and then, doubtless, he may find a young friend not unwilling to submit to serve as his model; and, if he has done all that has been required of him, and carefully exercises himself in these few examples, he will possess the capacity of drawing a foot, and presently a hand, from nature, with ease and accuracy;—and more: if he can draw a Head, a Hand, and a Foot, he can draw the Figure, or any other

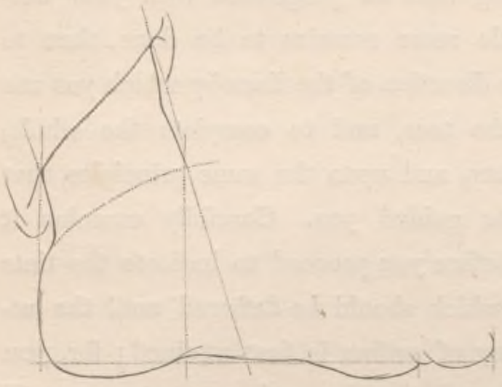


familiar object; not, perhaps, with the precision and touch of a master, but he can achieve enough to insure the possession of a safe and certain groundwork of useful practical knowledge and facility of Design.

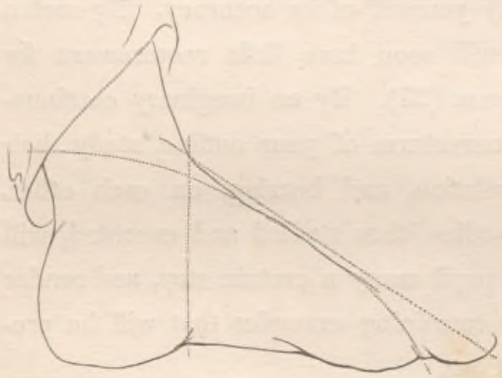
78. The first thing to be done, in drawing the above example, is carefully to examine and study the original, and to ascertain its proportions, as nearly as you can, without measuring. Then cautiously set about its outline, which should be accurately, but delicately defined, before any attempt is made to express the shadows or tints, which are in comparison with it of secondary importance, especially at this stage of your progress. Be not in a hurry to make pictures; learn to draw correctly, and the pictures you make, by-and-by, will be all the better for it.

79. (I) Lest the principles, upon which the outline on the last page is produced, should not be sufficiently understood by the pupil, let us enter into a more concise explanation; and, for the sake of economizing space, by a reduction of it, which will answer all purposes. As he reads, he can refer to the larger outline. It should be borne in mind, that all the examples, and, indeed, everything else the learner attempts to draw, should be, as nearly as possible, the size of the original; thereby avoiding that confusion of lines, and indecision, almost inseparable from diminished drawings, and which, in spite of every precaution, are more or less characteristic of the efforts of all beginners. Self-deception, which is apt to result from the practice of drawing in small, should be carefully guarded against. The quality of prettiness, which, often, is no more than littleness in art, may disguise errors, which drawing in large develops; but it performs a faithless service—one highly prejudicial to the advancement of the student, and calculated to mislead: for the evidence of his errors is the safest guard against their recurrence.

(II.) It is of the first importance to secure certain starting points, as well as a scale of proportion for the parts. Having decided on the length, from the heel to the end of the great toe, next ascertain the direction of the outline defining the sole of the foot. Remark (or mark, in your first trials) the points of the principal indentations, or features; and, surely, if you can draw the profile of a face with any degree of accuracy, but little difficulty will be encountered in drawing the simple curved line before you. But simple and easy as it may be, it must be done with precision. Observe that the outline above the heel disappears at a point immediately perpendicular to the extremity of the heel—remark the peculiarity of the curve of that portion of the outline—connect it with that of the sole of the foot—do it cautiously and carefully, and, if correctly, you have not only certain starting points, but one half of your outline already done. Do not suffer yourself to be deceived, when you have only produced an outline to look *something like the original*; that is not enough: it should correspond to it *exactly*.



(III.) You will observe that the point where the instep unites with the leg is directly perpendicular to the termination of the outline of the heel, where it unites with that of the hollow of the foot. The direction of the outward line of the leg would, if continued, strike a point about the middle of that of the hollow of the foot. The intersection of these imaginary lines gives you this important point, which you can further verify, by extending the curve of the heel, upward, to their intersection. Assure yourself, by close observation, how far the lines in the original correspond with those before you; and then proceed with the completion of your outline, observing, throughout, the utmost caution, and endeavor to obviate the necessity of correction, by avoiding the occurrence of error.



(IV.) Ascertain the direction of the line of the instep by a straight line, as indicated, and then verify its sweep by a continuation of it at one or both extremities. This method of the imaginary extension of lines, when once made familiar, will be found of great assistance to the draughtsman; and it is more readily acquired than may be at first imagined. It serves not only the attainment of accuracy, and lessens his labor, but insures harmony of the parts and details with one another. It also tends to habituate the eye to the observation of the true character and forms of objects, divesting them, as it were, of those minor details, which often obtrude themselves, and lead the eye and hand astray from the first broad and general impression or conception—which is of primary importance, and should be carefully secured at once, and never lost sight of. Herein lies one of the great secrets of the ease and freedom in the expression of an idea, that give such a charm to the sketches of the experienced artist—by which he conveys his impressions in a few lines, apparently dashed off at random, but often far more to the purpose, and more expressive, than the more labored effort of the less gifted or less educated in art.

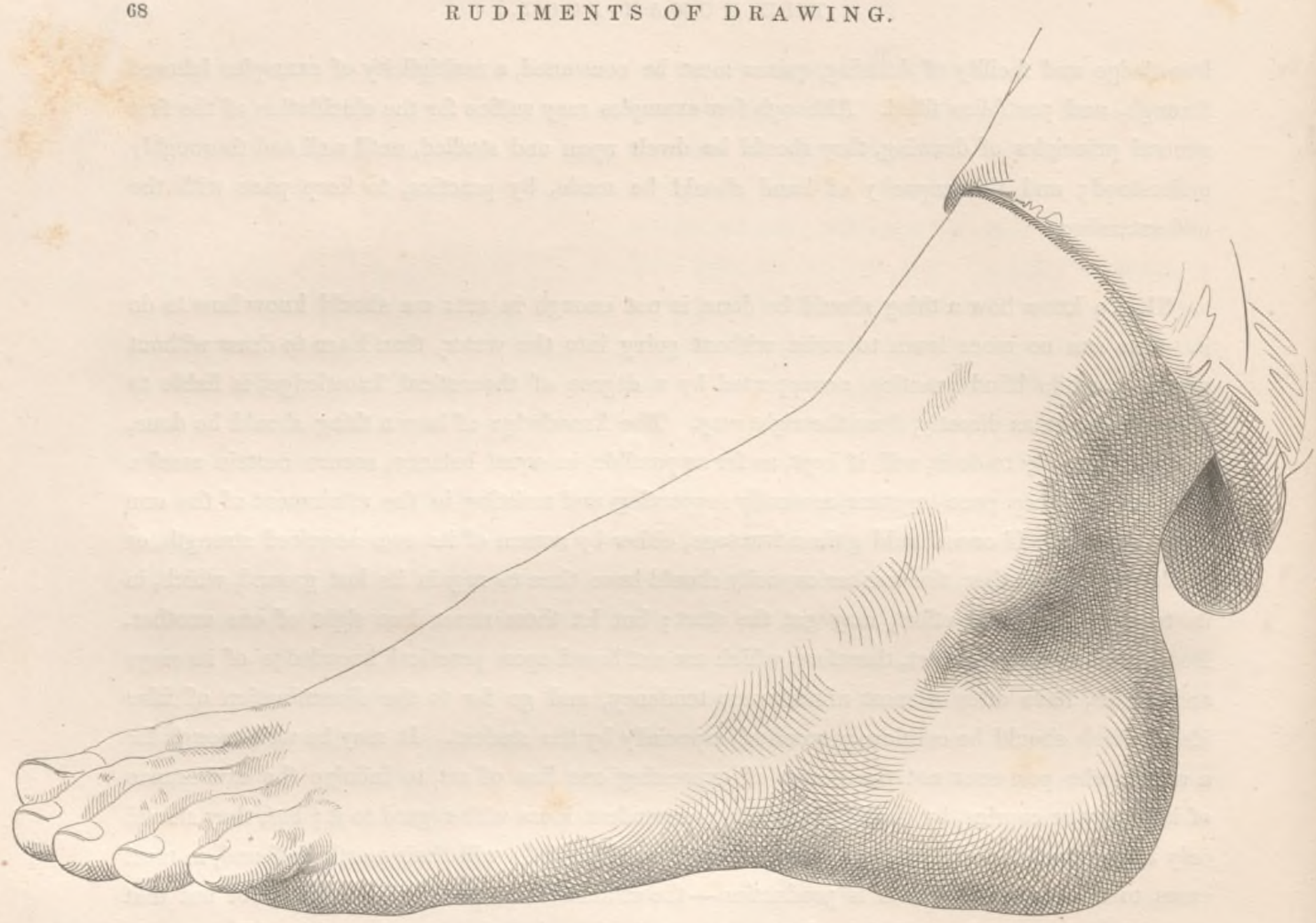
(v.) Having thus far progressed with your outline, but little more remains to be done, than to ascertain the direction of the lines by which you are to express the toes, and to complete the whole, in like manner, and upon the same principles, that have thus far guided you. Carefully examine it throughout, before you proceed to indicate the tints or shadows, which should be deferred until the utmost accuracy of outline is first attained; for, you may rest assured, that, by such a course, you will secure to yourself the capacity of expressing them with ease and freedom, by the surest means.

(vi.) Compare the parts and proportions of the original with your copy. Observe that the width or thickness across the ankle is about equal to that of the instep, and length of the heel, etc. Test the judgment of your eye first, and measure only to satisfy yourself of its accuracy. By such a course, you will soon have little requirement for rule or compass (23). By an imaginary continuation of the curvatures of your outline, study their movement, relation, and bearing, on each other. One single outline, thus studied and executed, will advance the pupil many a certain step, and render easy the few remaining examples that will be presented to him in the course of these elementary instructions.

80. Presuming that the learner has not slighted what has been urged upon his attention, but that he has bestowed all the care, study, and practice, upon this example, that may be requisite; that he has, therefore, succeeded in producing, if not by one, by repeated efforts, a correct outline, he is fully prepared to encounter those that follow, with little other aid than his own strength and intelligence. If he has failed, let him be again reminded to retrace his steps. Let him depend upon it, he has lost or overlooked something, or perhaps many things, on the way, that he will need, even more hereafter than now, and without which, he will never become an accomplished draughtsman. Let him now, in good time, look to his deficiences, and seek their correction. It is a mistake to suppose that, to acquire a

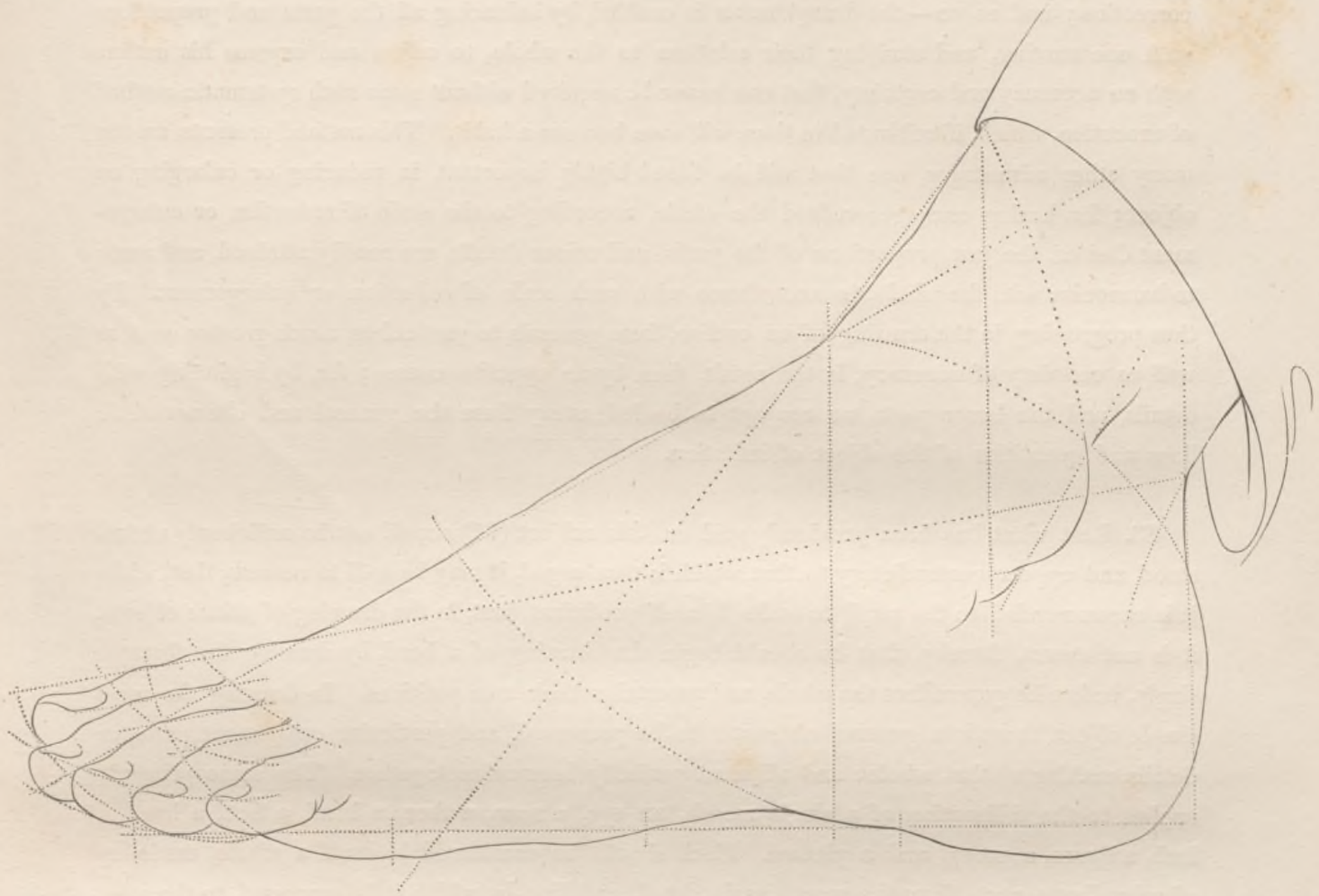
knowledge and facility of drawing, quires must be consumed, a multiplicity of examples labored through, and portfolios filled. Although few examples may suffice for the elucidation of the first general principles of drawing, they should be dwelt upon and studied, until well and thoroughly understood; and the capacity of hand should be made, by practice, to keep pace with the understanding.

81. To know how a thing should be done, is not enough in art: we should know how to do it. One can no more learn to swim, without going into the water, than learn to draw without practice; while blind practice, unsupported by a degree of theoretical knowledge, is liable to mislead, almost as directly, from the right way. The knowledge of how a thing should be done, and the capacity to do it, will, if kept, as far as possible, in equal balance, secure certain results. They should keep pace together, mutually supporting and assisting in the attainment of the one great purpose. If one should gain advantage, either by reason of its own acquired strength, or weakness of the other, the weaker capacity should have time to regain its lost ground, which, in its turn, by that very effort, may get the start; but let them never lose sight of one another. Books and treatises on art, therefore, which are not based upon practical knowledge of its ways and means, have often a most mischievous tendency, and go far to the dissemination of false ideas, which should be cautiously received, especially by the student. It may be well enough for a writer, who possesses not the power of expressing one line of art, to indulge the exuberance of his fancy or caprice, by dashing forth his transcendent ideas with regard to it; but, they should only be received for what they are worth—and precious little will their worth be found, in most cases, to those whose business is production—the attainment of practical results. Not but that everything that can be said, in reference to art, is deserving the attention of its followers, yet the judgment should be prepared, in some degree, at least, before it can arrive at just conclusions, or be capable of exercising proper discrimination, in separating vague and impracticable theories from those that are well digested and useful. It is easy for the learned geographer to trace the route, to distant lands, over tempestuous seas; but he can no more navigate the bark to them, than the merchant who sends her forth. It is easy to say, and even feel, that a picture, a statue, or any other work of art, should be thus, or thus—should be perfection, that remote idea of perfection in itself imperfect, and founded, too often, on false or capricious notions; but, he who has no experience of the way to reach it, can never make it plain enough to others, to substitute his dreamy fancy of its direction, for long-established and well-tried landmarks, whose value to the student has been proved by the faithful guidance they have afforded to the great masters of art, who have reached its highest perfection, yet attained. Let us, therefore, judge of the mode of



culture by its fruit, nor discard the old, beaten, well-known path, until we can find a better — one, at least, that some traveller has pursued with success.

82. After what has been said, in relation to the method of drawing the outline of the previous example, it would be paying but a poor compliment to the intelligence of the pupil, to enter into a repetition of it, in reference to the above. It may be proper to remark, however, that the general principle, rather than any arbitrary process, of forming comparisons in relation to the parts, or of ascertaining and expressing the true direction of the lines, their movement, form, and connexion, most particularly require his attention, and should be the main object of his study and practice. The outline of the sole of the foot has been taken as a basis, or starting point, because



its direction and quantities were more easily defined; but it does not follow, that it should be taken thus in all instances, as there are many positions of the foot, in which it may be secondary, and more dependent on other leading points and lines. Proper judgment, therefore, should be exercised, in the selection of the line, or lines, most expressive of the general action and character of the object to be represented. This important beginning once made, farther details must naturally assume their just positions and connexion to the whole, as well as to one another—besides, serving in the process as correctives. If, for instance, the length of the foot should be too long, or too short, the moment the points indicating the true length of the heel and toes are decided upon, the length of the hollow of the foot, between the two, will be evidently too long or too short. A primary error is thus detected, by comparison with the other parts, in time for

correction; and so on—the draughtsman is enabled, by balancing all the parts and proportions with one another, and studying their relations to the whole, to adjust and express his outline with an accuracy and certainty, that can never be acquired without some such systematic method of execution, which, if cultivated in time, will soon become a habit. This method presents, among many other advantages, one that will be found highly important, in reducing or enlarging an object; for, having once generalized the whole, according to the scale of reduction or enlargement desired, the just proportions of the parts, and minor details, are readily attained, and made to harmonize with the whole, in accordance with such scale of reduction or enlargement. By thus progressing, in the drawing of an outline, from generals to particulars, much greater ease, as well as certainty of accuracy, is the result, than by an opposite course; for, by beginning with details, and the lesser parts, we are apt to be led astray from the general and characteristic lines and quantities of the object of imitation.

83. Lest what has been previously said on this subject (61) should not be sufficiently understood, and appear contradictory to that which is now urged, it may be well to remark, that, while it is recommended to the pupil to make himself proficient, first, in the drawing of minor objects, it is not meant, thereby, that he should begin the drawing of a head, by drawing the features singly, before he generalizes the whole, and ascertains their true positions. In drawing the most simple object, there is a *general* character to be preserved, and particular component parts, or details, making up that whole: and all must perfectly harmonize together. The same principle applies to the delineation of a single mouth, an eye, a nose, a face, a head, a foot, a hand, a limb, a figure, a group, and a picture. Each should be considered in itself a whole, made up of subordinate parts, from the most simple detail, and line by which it is expressed, to the most elaborate work of art. Thus will the eye and hand become strengthened, by progressive study and practice, and the capacity advanced by degrees, almost imperceptibly, under the safe guidance of the one, like, universal principle.

84. The first conception, and consequently the first impression, to the mind of the artist, of his picture, is of its general character; and it is produced by gradually descending, in its execution, to the parts and details—each in their turn of subordinate and relative importance. This must also be its first impression on the mind of the beholder: he, too, is led to descend, in its contemplation, from generals to particulars. The rules of production and just appreciation, naturally assimilating to one another, no elaboration of details can compensate for an unfavorable first and general impression, nor the toil and labor, bestowed upon them, meet their

reward, unless kept in proper relation, harmony, and subordinate service, to the whole. The principle is the same, whether the drawing, or picture, be the representation of the most simple object, drawn by a tyro in art, or the most elaborate composition, by the most accomplished artist. Let it be clearly and expressly understood, therefore, by the pupil. He should first learn to draw simple and single parts; then objects and figures; then pictures; and consider each a whole with its parts—that whole assuming the relation of a component part to a greater whole—and thus progressively advance his capacity of observation and execution: never losing sight of the broad principles, upon which he has started, and upon which he must still rely, in the highest efforts to which he may be tempted hereafter. The proper understanding and appreciation of these principles, will direct the judgment aright in estimating the value of detail in particulars, in the expression of a general idea, and conveying its desired impression. For, although, a drawing of an oak-leaf, if the mere representation of an oak *leaf* be the object, should be exact and true, in all its markings and peculiarities, it does not follow, that, in drawing the *tree*, we should draw every leaf of it; the importance of minor details being, to a certain degree, lost in the general effect of the whole. And yet, he who can not draw the one, will never succeed in producing a correct resemblance of the other. The leaf is the easiest, and, if properly studied, develops as clearly the principles of design, by which the tree may be expressed; and, therefore, should be placed first before the pupil. In its application to the higher departments of art, this leading principle is still more impressive; but, at this period of the student's advancement, it would be out of place, to enter as minutely into the subject as may be done hereafter, when his discrimination and capacity may be more matured, and his mind better prepared for its comprehension.

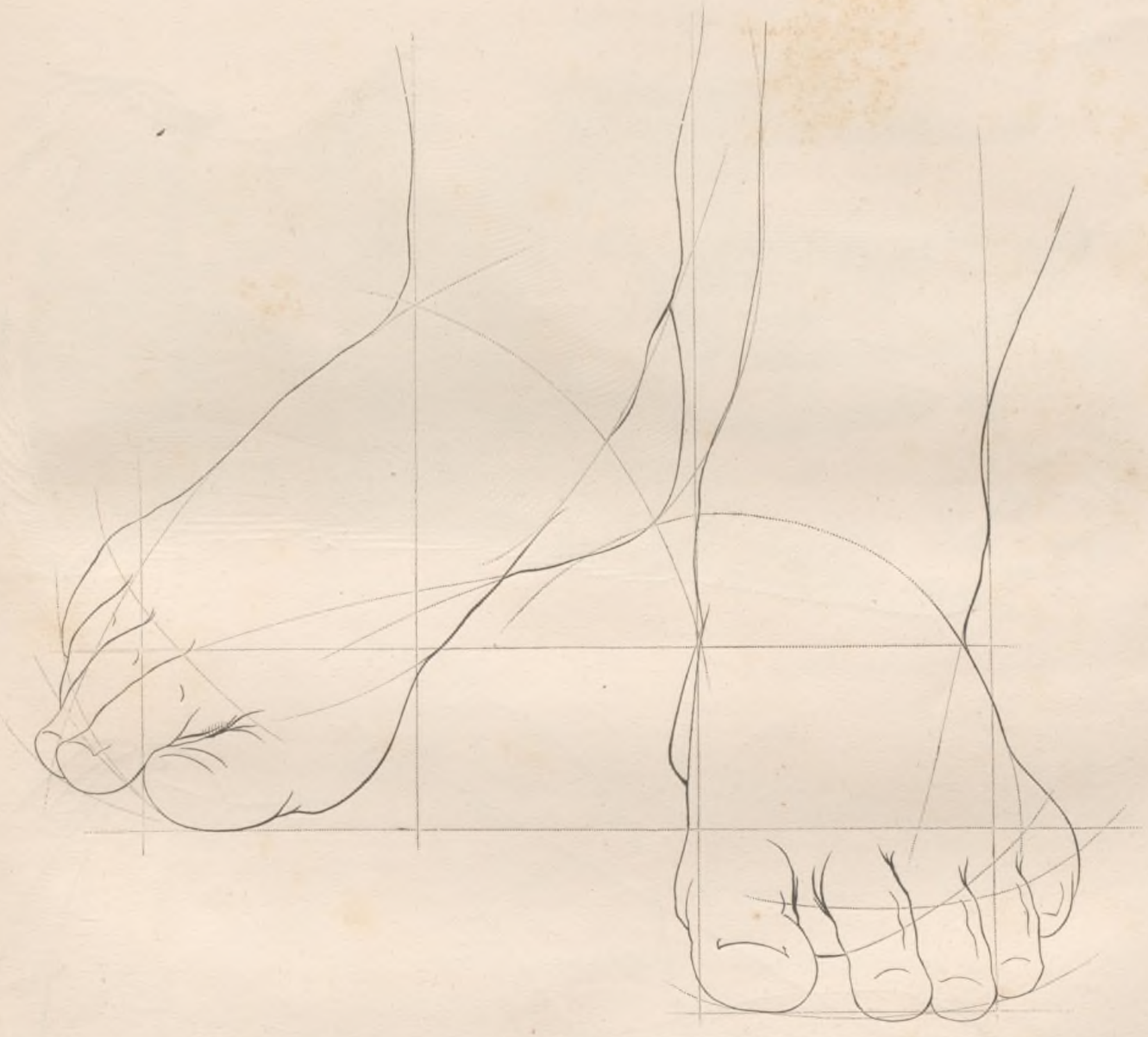
85. A well-formed foot is rarely met with, in our day, from the lamentable distortion it is doomed to endure, by the fashion of our shoes and boots. Instead of being allowed the same freedom as the fingers, to exercise the purposes for which nature intended them, the toes are cramped together, and of little more value, than if they were all in one—their joints enlarged, stiffened, and distorted,—forced and packed together; often overlapping one another in sad confusion, and wantonly placed beyond the power of service. As for the little toe, and its neighbor, in a shoe-deformed foot, they are usually thrust out of the way altogether, as if considered supernumerary and useless, while all the work is thrown upon the great toe, although that, too, is scarcely allowed working-room, in its prison-house of leather. It is therefore hopeless to look to a foot, that has grown under the restraint of leather, for perfection of form; and hence, the feet of children, although less marked, in their external anatomical

development, present the best models for the study and exercise of the pupil in drawing. It is unfortunate, that so few fine specimens of the hand and foot have remained to us, from the antique, from the fact, that these extremities have been more liable to injury and loss, from the casualties and neglect to which they have been subject, during the long night of ages of ruin and desolation through which they have passed; but we have enough to show how well the ancient artists understood and appreciated the beauty and perfection of these members. If possible, the pupil should always have by him one or two good specimens from the antique—and they can be readily procured in plaster—to correct his judgment, and impress upon him the true and perfect form of the foot; for he will rarely meet with it, in nature, and yet these very standards of perfection are derived from nature.

86. An example on the next page, drawn from the antique, shows now rarely, if ever, is found in one living model, whose feet have endured the restraint of shoes, the combination there seen, of beautiful form and proportion, ease and elasticity of motion, as well as admirable expression of adaptation, and power for use and purpose throughout. And how have they been produced? By no magical touch. Although the work of genius, genius could have done nothing, unless aided by knowledge, observation, and practical experience: and this is the business of the student, and must form his constant pursuit—for there is no end to the pursuit of excellence in art. The spirit and capacity for investigation are gradually advanced, as the perception and taste become quickened and purified. An unsatisfied thirst for knowledge for ever leads to the great fountain-head of all art—the study of nature; and no sure system of education in art can be devised, diverging from this well-tried course. To possess this capacity for just selection and combination, we must become familiar with nature as she is. By study and comparison, the eye must be made sensitive, and, by practice, the hand must be made obedient. We must become practically familiar with the power of art, in the imitation of nature, before we can select with proper judgment, and combine with knowledge, her diffused beauties. It is this high attainment that marks the best works of the ancient masters; and, while they enchant all with their marvellous beauty, the most learned pronounce them faultless—true to nature: and yet, in nature, we look in vain to find similar happy combinations. But to pursue this subject farther, at this time, would be to lose sight of the purposes of these elementary instructions, which are intended to lay a secure foundation; glancing, occasionally, at the more finished structure, by way of encouragement and incentive, to those who may not be sufficiently impressed with the importance of so broad a basis, and who might otherwise weary in the good work.

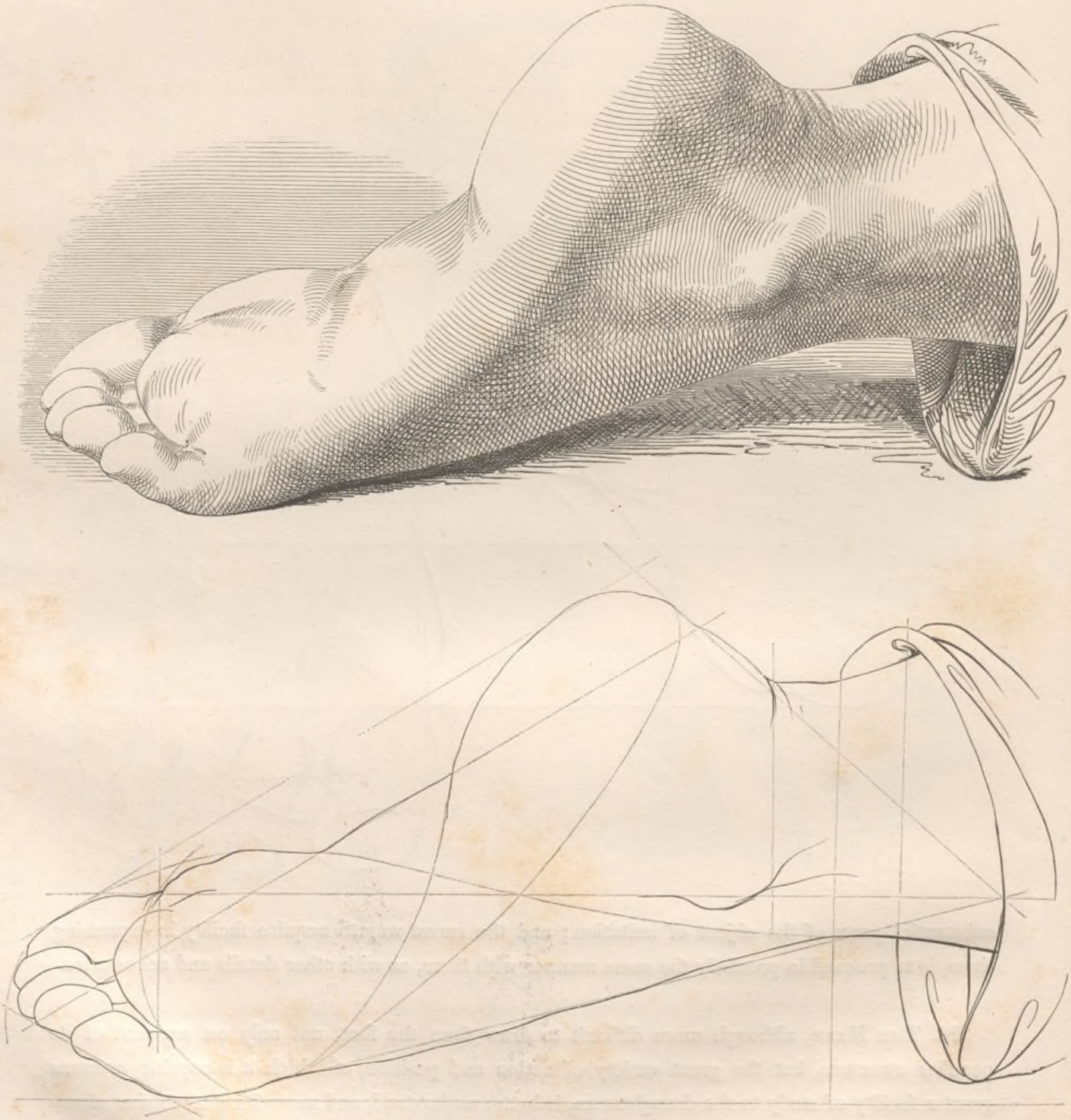
87. Without entering into farther detail, with regard to the following examples, they are placed before the student, with the hope that enough has been said already, to render the principles of drawing easy of comprehension and practical application. One thing can not be too often repeated, or too urgently impressed upon him—the importance of a correct outline. An early-acquired and premature facility, in expressing tints, "in working up a drawing," as it is termed, has led many astray from the first purpose of art—truth and accuracy—which a piece of chalk or charcoal, in a skilful hand, will express more certainly, on a rough wall or board, than the most delicate touch, or the most exquisite materials, can ever accomplish, unless guided by sound elementary knowledge of the great first principles of art. It should be remembered, too, that shadows and tints have an outline to be preserved, and accurately expressed, in accordance with the effect produced on the object of imitation; less strongly marked, in most

cases, it is true, but it is there. By the aid of shadows is developed the true form of the model; and to parts more or less advanced or depressed, are thereby given a location, as decided and certain as if seen in profile. So truly can they be expressed, on a flat surface, that a sculptor can model a bust, from a picture, and the eye may be so completely deceived, by their close representation, as scarcely to distinguish the reality from its counterfeit. It is, therefore, as essentially necessary to preserve the forms, masses, and proportions, of shadows, as of the more



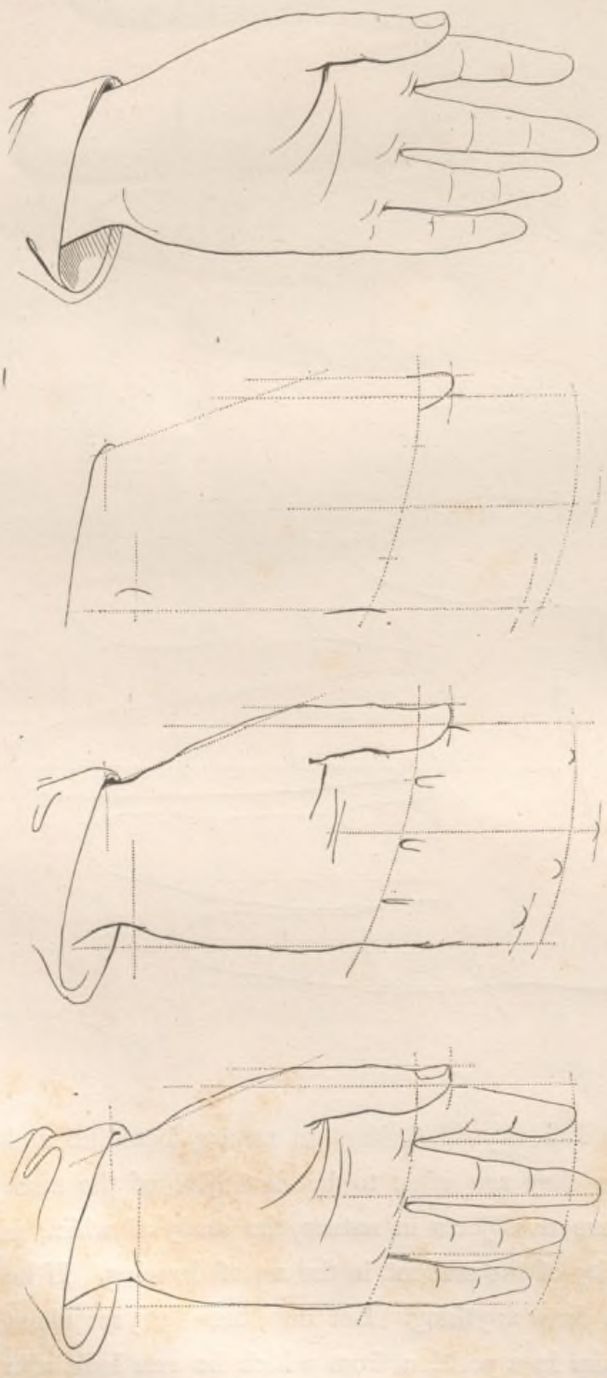
substantial parts of the object of imitation; and the surest way to acquire facility in expressing them, is to proceed in precisely the same manner with them, as with other details and accessories.

88. The Hand, although more difficult to draw than the foot, not only on account of its peculiar structure, but the great variety of action and position, of which it is capable, presents greater facility of study to the draughtsman, is better understood, and more familiar to our obser-

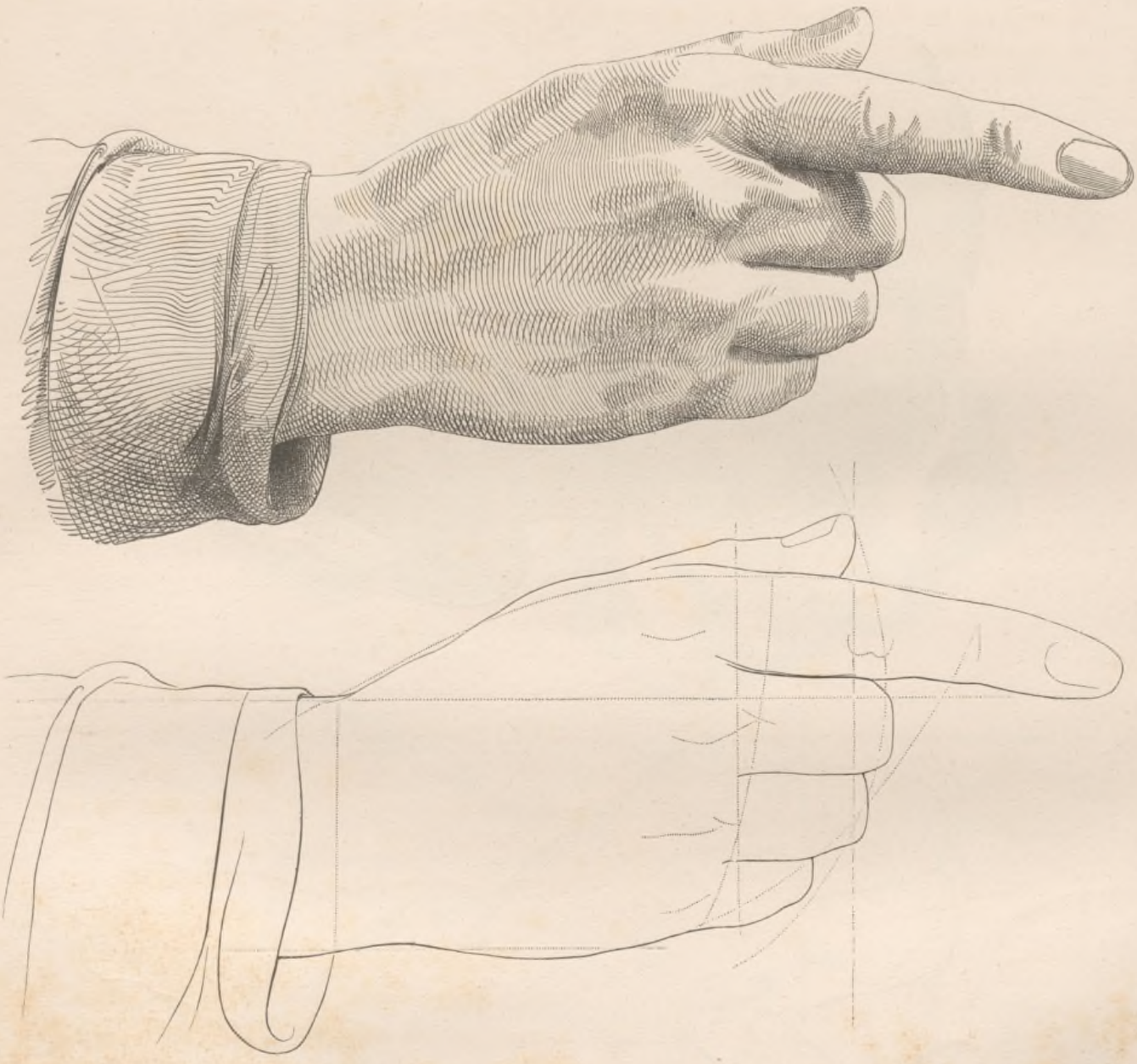


vation. What has been said, with regard to the difficulty of finding, in nature, beautiful and well-formed feet, does not apply to the hands, for they are often to be met with, of the most exquisite form and just proportions; and there are no objects in nature, the study of which is better calculated to strengthen the general capacity of the student, in the art of drawing. If he can draw a hand, with ease and accuracy, he can draw anything. Let him, therefore, set about the work with earnestness, for success will place him in a position, from which he can look with

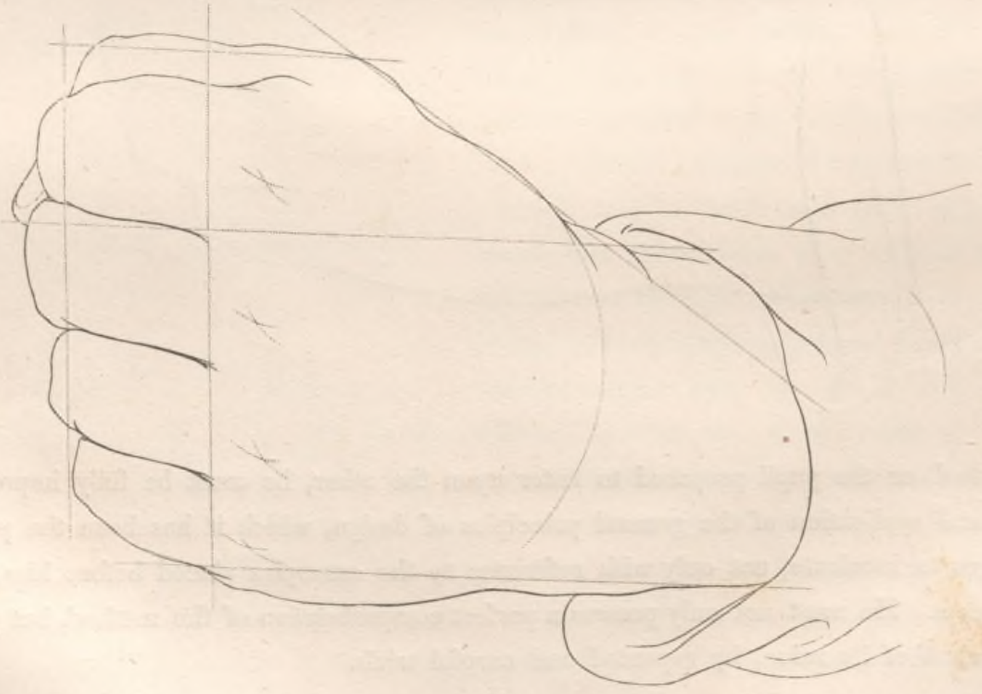
pleasure on the labor by which it has been attained, and forward to the assured consummation of his most ardent aspirations.



89. If the importance of first securing the general form of the head and foot has been already felt, it will be evident, with greater force, in drawing the hand, especially when the fingers are extended. Let us, therefore, have recourse to a reduction of the outline of this first example of the hand, to explain more fully the method or process by which it can be most readily obtained. When once the general form of the principal and most massive portion of the hand, extending from the wrist to the beginning of the fingers, is ascertained, and indicated with accuracy, next decide upon the length, expansion, and relative position, of the fingers, as a group, and then proceed with each, in its turn of relative importance, continually comparing and verifying your conclusions, as you advance, by the method already explained; never losing sight of the general character of the whole, and keeping the parts in perfect harmony of action with it. This example may be found even more difficult than those that follow; but it is well for the pupil to have his strength tested, and if he has earnestly, and successfully, followed the line of study marked out for him, thus far, he may be safely said to be even now within sight of the more pleasant ways of art, with assurance of strength and capacity to enter upon the broad and boundless field that lies before him. A little farther, and the elementary work is done, and another, and higher, is begun. But, before the one is



accomplished, or the pupil prepared to enter upon the other, he must be fully impressed with the practical application of the general principles of design, which it has been the purpose of these pages to inculcate, not only with reference to the examples placed before him, but to all other objects. He must not only possess a perfect comprehension of the method, but practically assure himself of its value, by repeated and careful trials.



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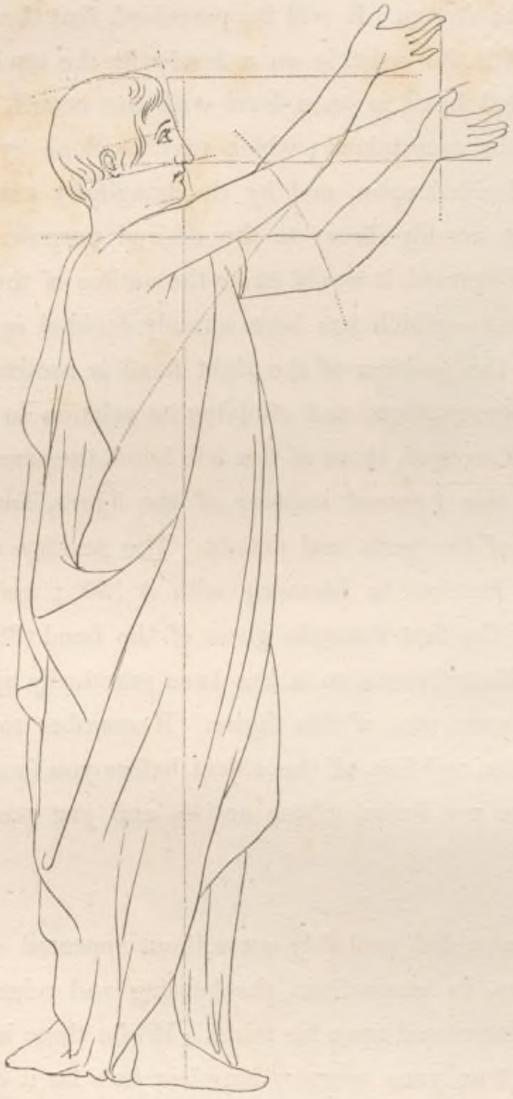
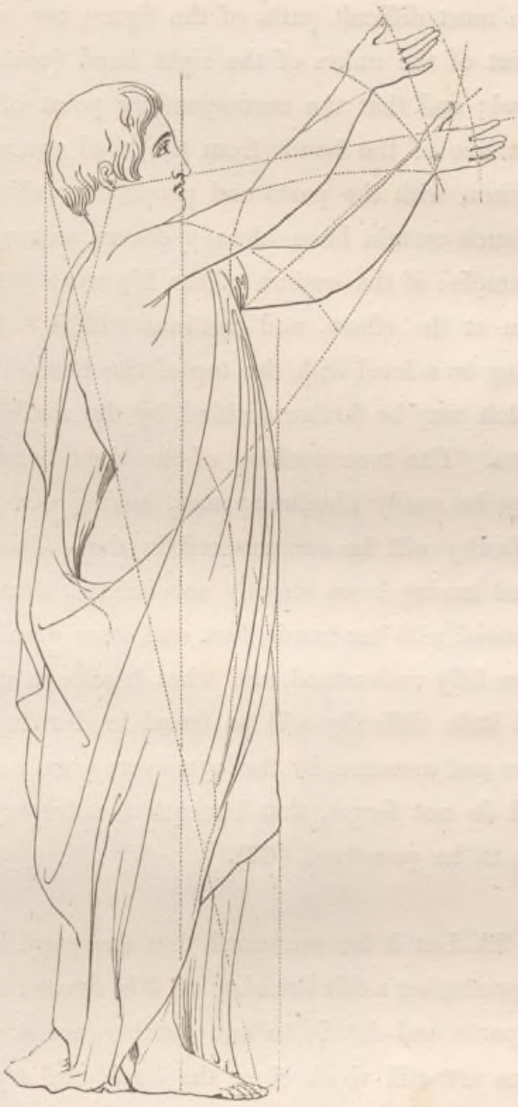
90. After having required the devotion of so much time and study to the delineation of the head, hand, and foot, the figure, as a whole, might appear of sufficient relative importance to demand a larger space than will be devoted to it, at this time. It should be remembered, that these elementary instructions are inductive and preparatory to that more concise consideration and study of the anatomical construction of the human frame, essential to those who aspire to the attainment of excellence in the higher branches of art, which do not strictly belong to the mere rudiments of drawing. Until the mind and hand have been schooled to act harmoniously together, until the broad principles of design are first developed to the understanding of the pupil, and he is made to feel wants beyond those of the beginner, it is not only useless, but even prejudicial to his advancement, to confuse his mind with theories and treatises, which he can not fully understand, nor practically apply. To talk to him of bones and muscles, before he has attained sufficient command of hand and eye to draw, with at least some degree of facility, more simple forms and objects, is like pitching one, headlong, into a deep and rapid current, to teach him to swim.

91. If the interest of the student has been excited, and his attention bestowed upon what has been already said, and so earnestly urged upon him, and he has mastered the examples of the head, hand, and foot, already given, he will experience but little difficulty in drawing any form or figure that he may attempt. When it is said that he possesses the capacity to draw a figure, it should not be understood, thereby, that he is capable of that careful elaboration, or minute exactness, in lines or details, that is only acquired by long practice, and repeated acts; but, he will be able to express the general form, proportions, and action, of his model: he will be able, thence, to

descend to the parts and details: he will be able to do this upon fixed and certain principles, which, if properly understood, appreciated, and applied, will never mislead him.

92. Let the pupil now attempt to draw the outline of this first example of the full figure, without having recourse to measurement, and without reference to other rules of proportion, than such as may be suggested by the careful observation of the figure before him, and by precisely the same method by which he has drawn the head, hand, and foot, separately. He will see, at a glance, that a perpendicular line, drawn from the upper lip, would intersect the point where the





instep joins the leg; and, having decided upon the height of the figure, he has already a certain basis, and starting points. Next, observe well the relation of the parts, proportions, and character of the general contour of the figure to this imaginary perpendicular line. The drapery takes one continued sweep, slightly modulated, by the form of the figure, from the heel to the left shoulder; which line, if farther extended, would touch the outline of the forehead, intersecting the assumed perpendicular line on the nostril: this gives, also, the direction of the head. The lines of the back and shoulders, those of the left leg, and the more massive portions of the figure, are, in like manner, to be ascertained, drawn, and verified (FIG. II.). The hands and arms,

the most difficult parts of the figure, are yet to be drawn. It will be perceived, that the lower point of the union of the right hand (FIG. III.) with the wrist, is on a level with the top of the head; and that the corresponding point of the left hand is on a level with the nostril. The distance of the hands from the head are next to be ascertained; which may be done by comparison with the parts and proportions already decided upon, and by the imaginary extension of such certain lines, already drawn, as may most readily direct to the desired purpose. For example: if the outline of the hip were extended upward, it would strike the outline of the right arm at the elbow, and continue with it to the wrist—which has been already decided upon, as being on a level with the top of the head. Thus the position of the right hand is ascertained; which may be farther verified, by the method of comparison, and studying its relation to other parts. The true position of the right hand, once secured, those of the left hand, the arms, etc., may be easily obtained; and, having completed the *general* contour of the figure, but little difficulty will be encountered in the delineation of the parts and details. The position of the head having been already ascertained, draw the features in harmony with it (56); and thus proceed with the hands, feet, and other details. If the first example given of the hand (89), has been fully understood, and what has been said with reference to it has been practically applied, but little difficulty will be found in drawing the arms, etc., of this figure. Remember to compare and measure, by the eye, every part, proportion, and line, of the object before you (FIG. IV); and do not forget, that beneath the drapery there are limbs, whose action, and just positions, are to be preserved (62).

93. Let it be presumed that the pupil has succeeded, probably not without repeated efforts, in producing a fair drawing of this figure: its lines, its proportions, the bearing and relation of its parts and details to one another, are strongly impressed upon his mind. While these impressions are still vivid, close the book, and try how true your memory may be; how far it can be trusted, by drawing the figure by its aid—for this is another and most important application of the method, which has been urged, from the beginning, as one of universal practical application. When made familiar to the draughtsman, by practice, he is enabled to seize, at once, the leading character of an object, however restless it may be, or transient his opportunity of observation; to fix it upon his memory, without drawing a line at the moment, and to reproduce it at will. It is by this matured capacity that he is able to catch the fleeting expression of a face, or the action of a figure, and to represent them with a degree of accuracy, as wonderful to the uninitiated as serviceable to him; for it gives him a power, in observing and recording the changing beauties of nature, which is denied to those who can only draw the inert model before them.

94. Without crowding the limited space allotted to these elementary instructions, with more numerous examples of the figure, than will be found scattered throughout the chapters devoted to them, and directing the pupil to the study of nature, and such good specimens in prints, drawings, or pictures, as may be within his reach, it may be expedient to give him, in conclusion, some general ideas of the proportions of the human figure; which are not intended to be used as recipes for "building up figures," but to aid in the observation and delineation of nature.

95. The Proportions of the Human Figure have been a subject of much consideration, and volumes have been compiled, by artists and others, in relation thereto. Although generally agreeing, in the most important points, there is still so much difference of opinion, with regard to details, that it would tend rather to confuse, than elucidate the subject, to the mind of the student, to place before him the various opinions and rules that have been published from time to time. Should his pursuit of art be extended to its higher walks, he will, in that great school of art—the study of nature—aided by the best and most approved productions, learn to form just conclusions, and, weighing the value of conflicting opinions, deduct for himself such rules and principles of proportion as may, in his mature judgment, form the best and truest standard of excellence and beauty.

96. The scale of proportions, most generally received, is that of Gerard de Lairesse; and they will be found ample for the present purposes of the student. It will rarely happen, that he has occasion to draw a figure perfectly erect, and with all the limbs seen, without some degree of foreshortening; due allowance, therefore, must be made for these circumstantial variations.

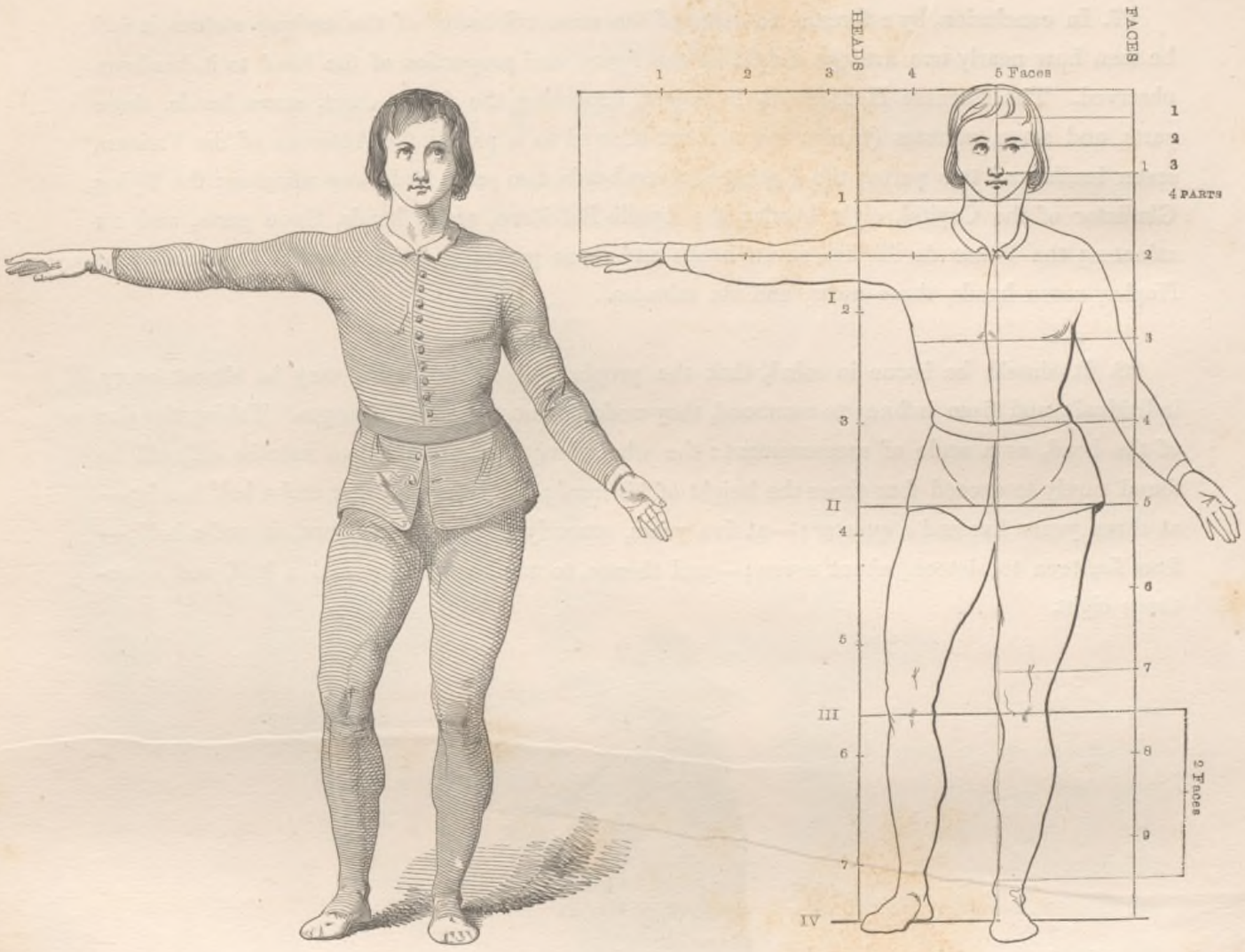
Taking seven and a half heads, as the average proportion in the height of a well-formed man, and dividing each head into four parts, will necessarily give thirty parts to the whole figure. Three parts make up the length of the visage (56)—consequently, ten faces will be the measure of the Figure: and thus its proportions, by that scale:—

1 face	from the crown of the head to the nostrils.
1	from the nostrils to the extremity of the throat, or hollow between the collar-bones.
1	from that point to the bottom of the breast.
2	to the bottom of the trunk, which is one half the whole height, or centre of the figure.
2	to the upper part of the knee.
½	or 1½ half parts, is contained in the knee.
2	from the lower part of the knee to the inner ankle.
½	or 1½ parts, thence to the sole of the foot:—making
10	faces to the figure.

The quarter divisions of the figure are at—

I. The armpits.
II. The bottom of the trunk.
III. The knees.
IV. The sole of the foot.

When a well-formed man extends his arms to their utmost stretch, the measure, from their extremities, equals his height.



The foot is generally considered as equal to one sixth part of the height of the figure; but this measure is excessive.

The longest toe is equal to the length of the nose.

The hand is the length of the face.

Twice the breadth of the hand gives its length.

The breadth of the hand is equal that of the foot.

The thumb is one nose in length.

These measures may suffice for imparting a general idea of the proportionate dimensions of figures; at least, they will be found sufficient for the pupil at this time.

97. In conclusion, by reference to some of the most celebrated of the antique statues, it will be seen how nearly one average height of the figure, and proportion of the head to it, has been observed. The Farnese Hercules is, in height, supposing the figure erect, seven heads, three parts, and seven minutes (twelve minutes are allowed to a part); the Antinous of the Vatican, seven heads and two parts; the Laocoon, seven heads, two parts, and three minutes; the Dying Gladiator of the Capitol, eight heads; the Apollo Belvidere, seven heads, three parts, and six minutes; the Venus de Medici, seven heads and three parts; and the Grecian Shepherdess, at Naples, seven heads, three parts, and six minutes.

98. It should be borne in mind, that the proportions of the figure vary in almost every individual; and from infancy to manhood, they undergo most marked changes. Taking the size of the head, as a scale of measurement: the whole length of a child, two months old, will be found rarely to exceed four times the height of his head;—at one year, four and a half heads;—at three years, five and a quarter;—at five years, scarcely six;—at ten years, six and a half;—from fourteen to sixteen, about seven;—and thence, to manhood, seven and a half, and sometimes eight.

CHAPTER IV.

THE RUDIMENTS OF DRAWING.

OF MANNER OR METHOD—THE ART OF WRITING, IN CONNEXION WITH DRAWING—GENERAL INSTRUCTIONS, ETC.—CONCLUSION.

"Rules are to be considered as fences, placed only where trespass is expected."—REYNOLDS.

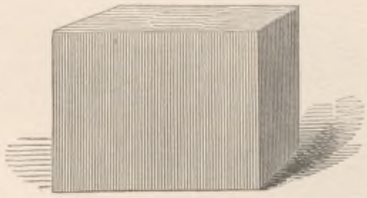
THUS far, the use of the pen, as an instrument for drawing, has been strongly urged, for reasons already explained; nor should it ever be laid aside or neglected. Too great importance is often attached to the mere imitation of MANNER, particularly in copying from the works of others; and if more thought and pains were bestowed upon the principles of design, and less upon the imitation of the touch or peculiarities of individual artists, there would be more leaders, and fewer servile followers, who, in emulating and imitating the means, lose sight of the great ends of art.

99. The test of excellence, in a method or manner, is its approach to precision, and distinctness of expression, by which an object, or thought, is most clearly represented. He that has a clear perception of the one, or the other, if assisted by proper education, will not be long in finding a manner or method of conveying it, in his own way, far better than by any he can borrow of another. It is often painful to see the toil bestowed upon a drawing, on which weeks and months have been worn away, in efforts to attain the peculiar touch of an example set before the pupil, without one thought of the sentiment, general character, or expression, of the original: to which the work, method, or manner, was only considered secondary by its author—as if, to write like Shakespeare, meant no more than to copy his handwriting.

100. Should the pupil now desire to try the pencil or crayon, he may do so, with profit and propriety; and he will find the use he has made of the pen has given his hand a degree of precision of touch, that he should never suffer it to lose in the use of other instruments, that are apt to lead to carelessness, because their work can be readily erased, or errors committed, readily disguised. In schools, as well as in private instruction, Indian rubber, stale bread, and all other devices for erasure, should, as far as possible, be kept out of the way; and thus errors will be avoided, by the absence of the ready means of other correction than a renewed effort, the preservation of their evidence, and consequent remembrance, and care, to prevent their recurrence in future attempts.

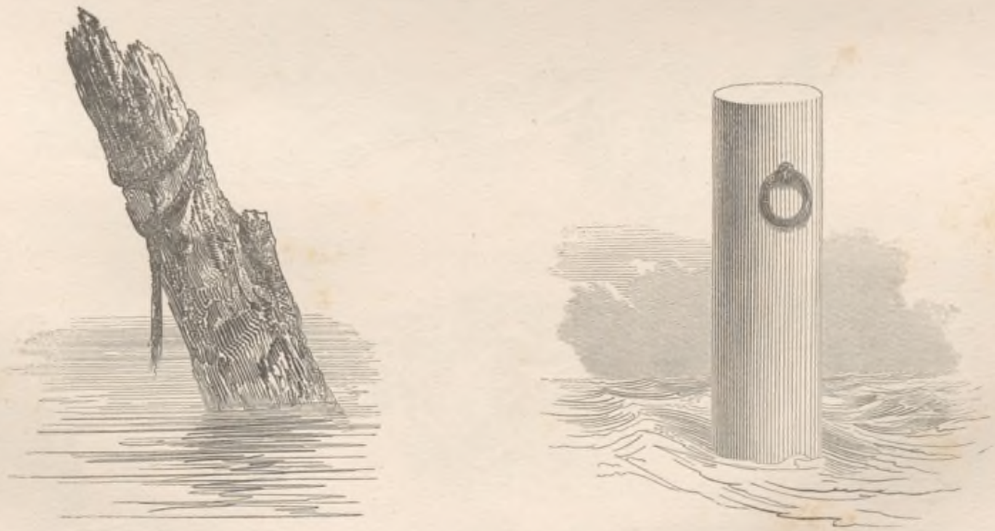
101. Although it might be better to leave the pupil to the selection of his own method, or manner, of expressing that which he desires to represent, after he has perfected its general outline, and to direct his attention to such a variety of drawings, by different artists, as may be within his reach—rather than those by any one individual hand—yet, a few hints on the subject may be found serviceable to him.

102. The instructions which have been given, in reference to the use of the pen, are equally applicable to the pencil, crayon, or chalk. The practice of the primary lessons, on straight and curved lines, will be found to have been essentially useful, in acquiring that command of hand, without which, proficiency in drawing is of no easy attainment. As in nature, objects take every variety of form and direction, so should the lines or touches, used in their delineation, have equal freedom in their direction, and always adapted to the purpose, and as expressive as possible, of the true form and character of the original. This may, at first, appear difficult; but, by observation, study, and practice, it may be soon acquired.



Suppose, for example, we desire to represent a square block, with a smooth, even surface: the greater degree of evenness and regularity that we can preserve in the lines, the nearer we will approach its faithful resemblance; and if, on the other hand, its surface be broken, or uneven, we must have recourse to lines, by which that character can be most readily expressed.

To represent a rude stake, water-worn and scraggy, far different lines are requisite, than if the object of imitation were a smooth and well-rounded post.



It would be in vain to attempt the representation of the effect of a brisk breeze, and a dead calm, upon the water, by lines similar in character; or, by the same touch, to express the woolly

and rounded form of a sheep, and the hairy covering, and more abrupt lines and action, of a goat.

103. The imitation, by beginners, of off-hand sketches, or memoranda, by practised artists, however spirited, and often effective, should be discouraged. They are, frequently, little more than the short-hand notes of a writer—intelligible to him, but only conveying, to others, faint and uncertain ideas—dashed off in a moment of haste, or under circumstances that would preclude

the possibility of doing more at the time, intended for the private use of the artist alone, and serving to preserve the recollection of the subject upon his mind, for future elaboration. To him, such sketches are invaluable; but, for the use of others, something more is required. A

drawing and a sketch are two different things. Although one must learn to draw, before he can sketch, the capacity for one is dependent upon the other.

104. What can a beginner learn, by the imitation of such a sketch as the following?—and yet, it is a fac-simile, the size of the original, of Wilkie's first sketch or idea, of his picture of the Rabbit on the Wall. To the eye and understanding of the artist, every line may have had purpose and meaning; but, beyond the interest it excites, as the germ of a finished work of art, it is, in a measure, valueless: and as an object of imitation for the student, it certainly presents but little, from which he can derive advantage. Even in sketches more defined and intelligible, where often are found, combined, a degree of grace and sentiment, rivalling more finished productions, there is still a freedom of line, and manner, belonging to an experienced hand—one well schooled and practised in design—and evidence of disregard to mere manner, or method of expression, which none but a master in art dare attempt. This very freedom, and capacity of reaching, at once, the higher attributes of art, by means so simple, yet certain, is attainable only by first learning to draw with accuracy and precision; by a perfect understanding of the use and power of lines, as well as practical ability in their direction. Many a mere beginner could produce more regular lines, and, in the common perversion of the term, a more "finished" drawing, than that of a Mother and Child, presented on the next page, from a pen-and-ink sketch by Guercino; yet, such a sketch could only be produced by one who could do more. Its excellence does not alone consist in its manner, or mechanical execution, which we might imitate for ever, without advancing one step to the ability of originating one comparable to it, in point of grace, character, and expression, unless we possessed, like Guercino, well-grounded knowledge, feeling, and capacity, far beyond the mere counterfeiting of another's hand. With an understanding of the principles of design, familiarity with nature, and a sense to appreciate the beautiful; with the possession of that command of hand, the importance of which has been so earnestly urged upon the pupil, and the means of its attainment placed before him; with careful observation and practice, he will soon acquire a facility of expressing himself, which, growing into a habit, will establish a *manner* for himself, far more serviceable, and better, than the imitation of that of another, however excellent or effective it may be.

105. Not that the pupil should consider the works of others unworthy his study and emulation; but he should learn, rather, to value the higher attributes of a work of art, above the less important peculiarities of the artist's hand, which are often the result of change of purpose, or

accidental circumstances, or carelessness in the production of a sketch. Many a beautiful idea has been suggested by a few random lines; even by an accidental blot, or stain, upon the paper, which the sensitive eye, and fertile imagination, of the artist have detected, and his ready hand developed with a few touches, that defy imitation. Often, in sketches, the artist may appear to have dashed forth, in bold explorations, in search of happy combinations of line, effect, and expression, upon which the beginner should venture with caution, and never from mere affectation. Let him study the spirit and motive of good sketches, whenever he can meet with them; but, let him learn to draw, before he begins to sketch.

106. While on the subject of *manner*, it may be expected that something should be said with reference to trees and foliage; but all the rules and recipes, that ever were promulgated, can not teach one to draw the most simple weed, without a feeling and capacity for the imitation of form. Landscape is too often regarded as a sort of safety-valve, to let off the exuberant

efforts of those who are either too idle, or indifferent, to endure the restraint of study. The distortion of a head, or figure, is apparent to every one; but the representation of a tree may be, in every way, disproportioned and out of character, and still it is a tree, and the producer of it at once an artist. Of all the applications of art to the purposes of the amateur, landscape occupies a deservedly high place; and its study should, therefore, be begun and prosecuted, with due deference to its importance. Let the learner at once discard the idea that, because he can sketch something to look like nature, his work is done, nor deprive himself of the enjoyment of those privileges that belong to the accomplished observer of the beautiful in nature—so liberally diffused, and available to all. To do this,

there is but one course to be followed. Nature beckons to him, and invitingly spreads forth her varied charms, to tempt him to her sunny fields—at once his teacher, and bountiful provider of all that he requires.

107. How must I draw an oak—how an elm—and how shall I touch a hemlock-tree?—are questions that weary the ear of the drawing-master with their continued repetition; and his reputation frequently is endangered, most unjustly, if he can not only tell them, but teach them how to do it, too, in one short half hour; and yet they themselves, perhaps, do not know the tree, when they see it in nature, much less, when it is represented in a drawing: and if they do, it is more by the shape of the leaf than the general form and character of the tree itself. Let this sort of quackery have no place with those who pursue the study of art with sincerity. Let them learn the first and leading principles of Design; let the eye be quickened to the keen perception and just consideration of form, and the hand ready and certain in its delineation; and then let them go forth, sketch-book in hand, into the fair fields that nature has provided, in her Free School of Art. One group of weeds, by the road-side, or along the murmuring brook, will teach

them more wholesome lessons of the "way to draw them," than all the books that ever were published on the subject. Then, and not till then, will the drawings and manner of others, in the delineation of such objects, be intelligible and useful to them: for, how can they judge of the truth of its representation, when they know nothing of the reality. Drawing is not to be taught like tambour-stitch and crotchet.

108. It is not only difficult, but impossible, to adapt any work of instruction to the various capacities and character of mind, upon which it is to operate, or, to devise any one system that will be applicable to every individual case; but, with the exercise of proper judgment, on the part of teachers and pupils, the elementary principles, which it has been the object of this work to present, in as plain and intelligible a manner as possible, will be found available to all. Children, and those who do not show aptness in comprehending the principles, and their practical application, should dwell on each lesson, and repeat it over and over again—always with care. One step, surely made, if it be but the drawing of a simple straight line, or curve, the next is half accomplished; and thus, progressively, should they be advanced. It is based upon no fanciful theory, that "any one who can learn to write can learn to draw;" but a truism, which the author pledges himself to establish, beyond a question, if aided by the intelligence and co-operation of American teachers, and those who have charge of the education of youth. It is within the means and capacity of all teachers, to instruct their pupils in the rudiments of drawing; and that, too, by an actual saving of labor to themselves, if the improvement of those under their charge has aught to do in the account. The least-pretending country schoolmaster would indignantly repel the insinuation that he did not know how himself, and could not teach his boys and girls, to write—and owns, without the slightest idea of deteriorating from his capacity as a public instructor, that he knows nothing of drawing; and yet, in his daily practice, he blindly teaches to draw, every time he sets a copy, and criticises the imitations thereof made by his scholars.

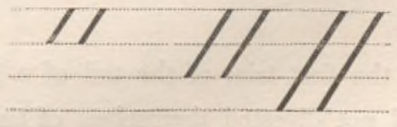
109. The author may be here pardoned a personal indulgence, in reverting to his own school-boy days, if on no other score than that of expressing his grateful recollection of his writing-master. In the thoughtlessness of boyhood, and the unconsciousness of the extent of the benefit then bestowed, his very name has been obliterated from his memory; but too often, in later years, has the influence of his lessons been felt to suffer his grateful recollection to pass away. He came to our village-school, unheralded and unknown—if I mistake not, on foot—a silent, sad, and unassuming man, who, for a pittance, offered to instruct a class in writing. He showed no unmeaning, flourished specimens, but wrote a line upon our teacher's desk, with an ease, and grace, and precision, that gained his engagement. Whether it was his gentleness of manners, his kind encouragement, the winning of his ways, or the magic influence of his system of instruction, writing became at once a delight, rather than a task; for we all set to work, with an earnestness that made us forgetful of the hour of playtime and recreation. He stayed but a few weeks and went as he came, bearing with him many a boy's heartfelt blessing and farewell. He could

not draw, perhaps, in the common acceptation of the term; and yet he taught, by a method well worth the imitation of teachers, the first principles of drawing: and thus it was:—

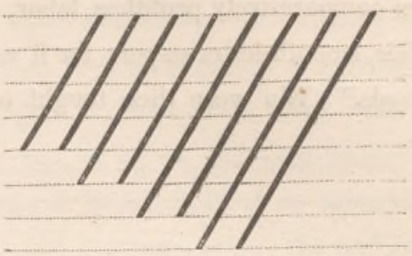
110. In the first place, the old-fashioned "copper-plates," over which we had toiled so long, in comparatively profitless labor, were laid aside, and each scholar was supplied with a quire of fair, smooth letter-paper; for it was a maxim with him, that "young workmen should have good tools." We were then taught to rule it in lines, and only on one side, thus:—

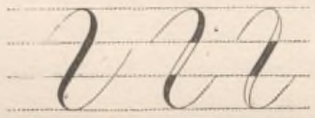
Those that were awkward were helped by him. Neatness was strongly inculcated, and considered as essential—a blot or a smudge, and all was to be done over again; and thus the habit was, from necessity, soon acquired and maintained. Soiled, inky fingers, and blotted copy-books, were seen no more; and, what can not be said of all school-boys, we went to our work with clean hands, at least. Steel-pens were not then in use; and he taught us to trim our goose-quill, to regulate its nib to large hand and small, how to prevent its tricks of spattering and blotting, exactly how far to dip it in the ink, and how carefully to lay it aside, well wiped, for another day. He had no arbitrary method of holding the pen, as if all hands, and the length and action of all fingers, were alike, but simply showed us what we had to do, and left to the natural action of the hand to find its most easy command of the pen.

The paper ruled in pencil, we began our first lesson—to draw a straight line, with a firm, decided hand: first, the distance between two, then three, and four ruled lines;



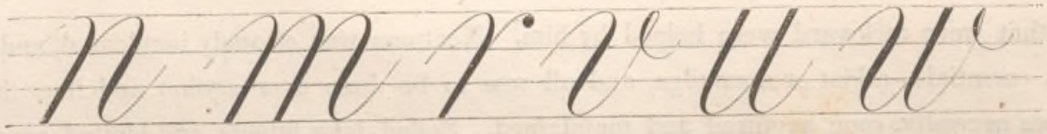
observing to press the pen at top and bottom, so as to expand the nib, and produce the proper degree of angularity in the terminations; holding it with even pressure, to maintain an equal width throughout the line. It was a difficult, and seemed almost a hopeless effort, at first; but after a page or two, carefully practised, there was not a boy in school who could not do it—and well. Then the lines were gradually extended to eight spaces. We had not reached the end of this lesson, before each one assumed, unconsciously, an easy manner of holding the pen; for, as the lines were to be continued without stopping, or removing the pen from the paper, the whole hand and wrist were necessarily brought into action; and a habit, almost universal with beginners, of writing by the action of the fingers alone, was at once corrected.



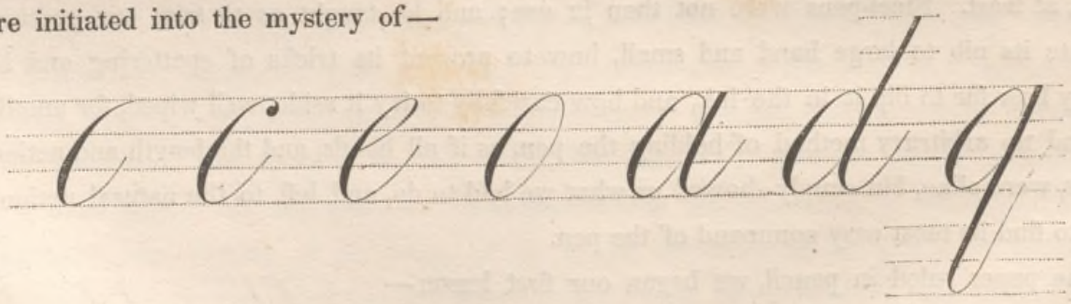


Next came the curves, and the nature of their form and delineation was explained: the gradual expansion of the line, as it approached and receded from the middle space, in which it became a straight line; the easy flow of the curve at top and bottom, and its exact repetition. He would examine, with a critical eye, our failures, show us every minute defect, equally dilate upon the slightest approach to success, and cheer, with words of encouragement, the most awkward.

We were now practised in the combinations; then a perfect letter was achieved; and, soon, such *ms* and *ns* were made as never before had been seen upon our writing-bench.

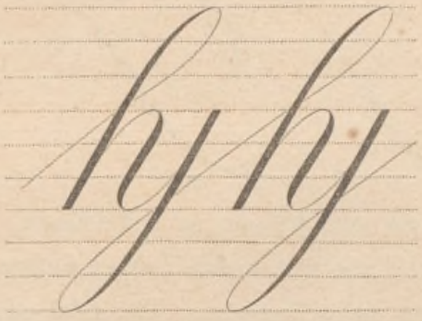


Something had been done; and we were indulged with a page or two of practice, before we were initiated into the mystery of—

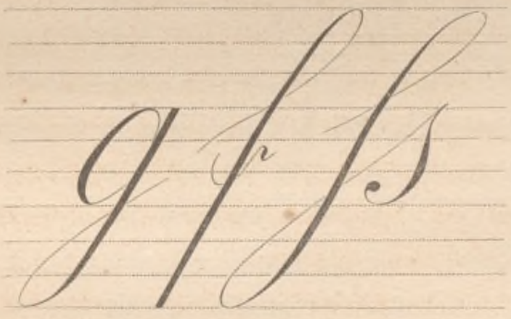


At the first trial of the tail of a *g*, a serious difficulty was encountered, especially by those who had not divested themselves of the old habit of dependence on the motion of the fingers alone:

for, now the whole hand, wrist, and arm, were brought into action; but two or three copies,

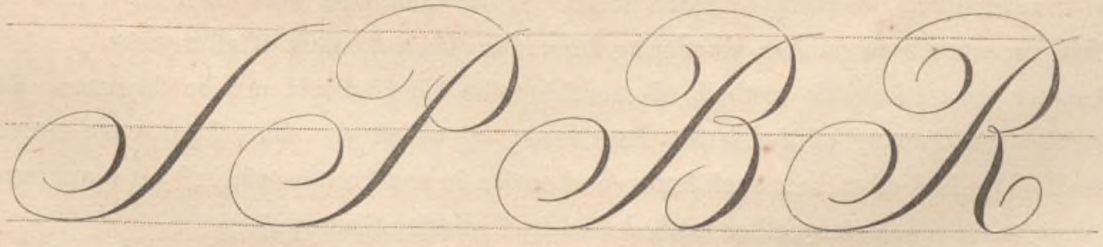
thus  , practised with care, and under his critical direction,

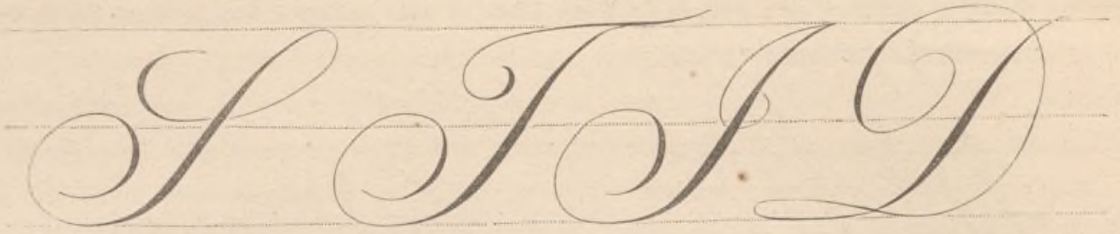
soon enabled us, in a great measure, to surmount it; and then we were well prepared

for  , etc. Every letter was to be formed with a slow,

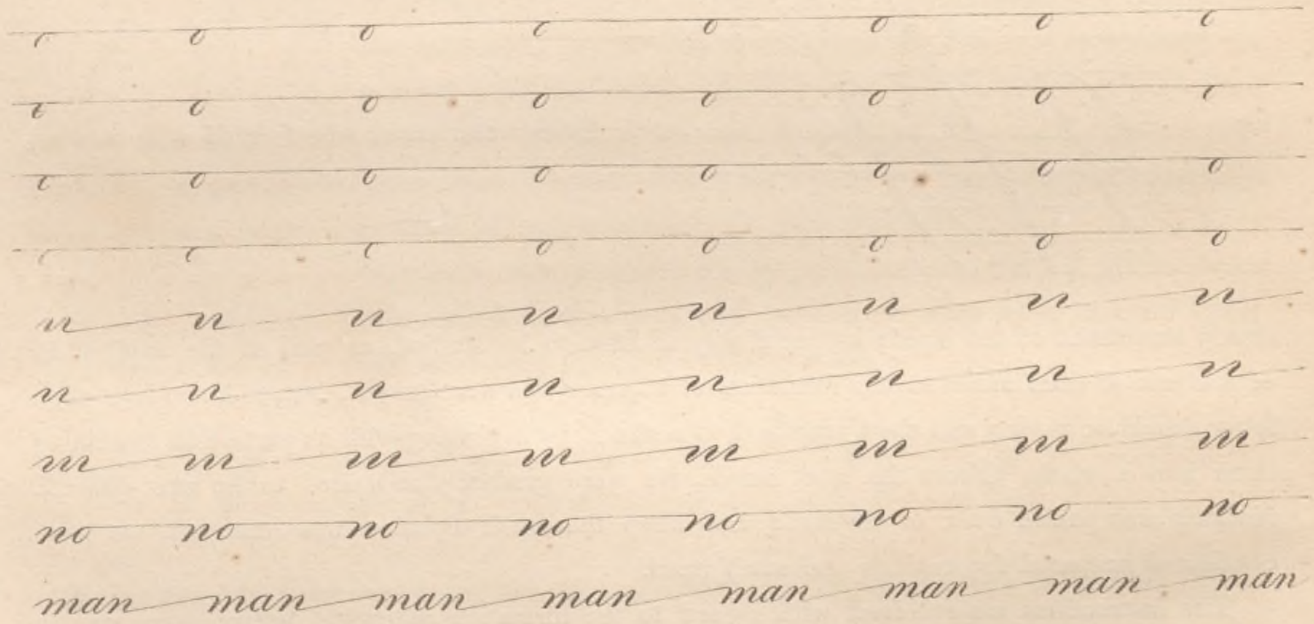
steady movement of the hand; its peculiarity of form to be studied, as well as the application of portions of each letter to the formation of others. We were taught, first, to know how each letter should be made; and then practised to make it, by beginning with its parts, and combining them into a whole. From the most simple, we were gradually advanced to the most difficult. Nothing was passed over, or slighted; and when the small alphabet was mastered, we were considered prepared for capitals and small hand.

The instructions we received, with regard to the formation of capital letters, were strictly drawing them. Every line and curve was to be studied, and their application and combination understood, and practically exemplified, upon like principles.



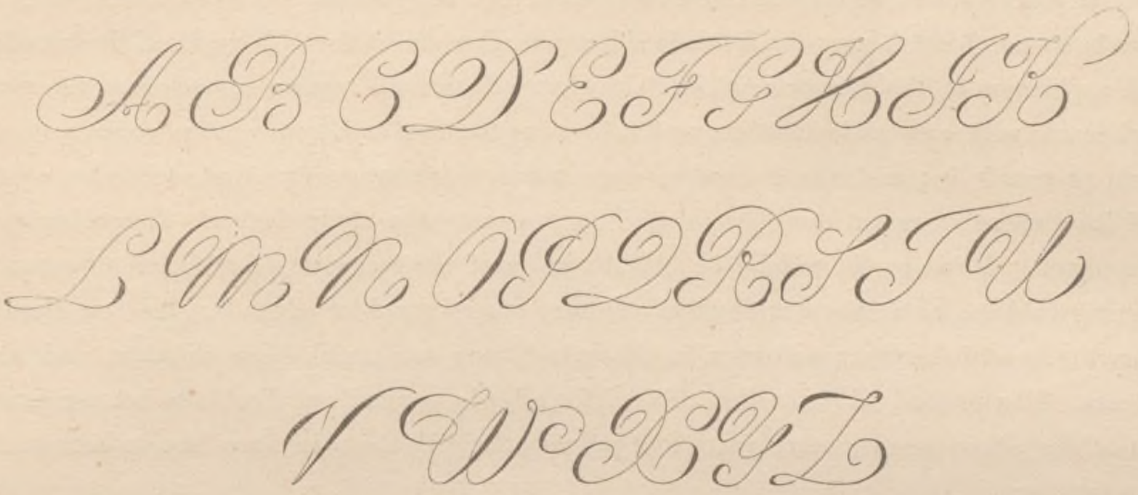


The ruled paper was now laid aside, and we began our lessons in small-hand. I well remember the feeling of helplessness with which I regarded the fair, unruled sheet before me—like a child standing alone, for the first time, and venturing on its first step. The trial came—it was to draw right lines across the page, without guide or ruler; a hard task, that few were equal to, but still we did wonders. From straight lines we progressed to the connexion of letters; and



thence, to simple words and sentences, not only written in a straight and even line, across the page, but repeated others, equidistant from each other, with a degree of ease and accuracy that would have done no discredit to older hands. If the men, who were then boys, now require ruled paper, or write in random, wandering lines, it has been the fault of after-years.

Another most admirable method, of exercising the hand, should not be forgotten. It was, to practise the drawing of the letters backward; by which the faint lines were necessarily reversed. We had often seen such letters and copies, in our "copper-plates," but never imagined they were to be done by any other method than by "painting them up."



Then, again, we were made to draw the letters with a single faint line; a practice well calculated to give ease and delicacy of touch, as well as certainty of hand: for he who depends upon the nib of his pen as a rest, will never be able to obtain command of it, or write, or draw, with ease and freedom.

Long after our writing-master had left us, and the fruits of his instruction were ripened, under the care of others, such continued to be sportive, as well as profitable exercises among us, on the slate and blackboard: and more than one complaint came against us, for our chalk-and-charcoal illustrations on the neighboring fences. Had there been, then and there, one to give a proper direction to this impulse, thus awakened by the instruction of our writing-master, to design, more than one would now hold his memory in grateful recollection.

Such a system of instruction develops the art of writing; and such is the art of writing, in its relation to the art of drawing. The teacher, or pupil, who can, with his pen, produce the most simple curve, and repeat it at pleasure, can draw. If he can not draw, the *art* of writing is to him a mystery as hidden. Let not the teacher, therefore, who undertakes to instruct in writing, say, "I can not draw." The time will come, when he will blush as soon, to own a want of capacity in one art as the other.

111. In schools, where a teacher of drawing is not employed, and even where there is one, the improvement of scholars, in both writing and drawing, may be promoted, in a very great degree, and with little or no additional labor to the teacher, by taking one half, or even two thirds of the time, usually devoted to writing, and applying it to drawing. The result will be found in no way to impede the improvement of the writing-classes; but, on the contrary, greatly facilitate

their advancement in that branch of education.* The copy-books, accessory to this work, will here be found of much use: for, by their aid, any teacher can induct his pupils in the knowledge and application of the first principles of drawing. He should require his scholars to practise each lesson with care and attention, and to become familiar, and, to a certain degree, perfect, in each, progressively; and the beginning once made, there is no fear that either he, or they, will have cause to regret the effort, or fail to prosecute the study farther. According to the advancement of his pupils, will he be able to judge of their capacity for higher attempts. In learning to draw, as in the acquirement of every other branch of education, the first steps are often the most important; and care, in the outset, may save much disappointment, and insure success. The method of instruction advised for schools, is equally applicable to home-education, or to those whose more mature years and judgment qualify them, in a measure, to become their own teachers.

112. The study of art is, in itself, so pleasing, that but little more is required of teachers than the initiation of pupils in its rudiments, upon such sound principles that they may continue its pursuit, aided only by observation, reference to nature, and good productions of art, and such standard works on the subject, as their wants may require. They will find, even before they have mastered the very first rudiments, and in their very first attempts to draw from nature, the absolute necessity of a knowledge of the first principles of perspective; and, if in earnest in the business, they will not fail at once to seek such knowledge: and it will be far better for them to supply the want when its necessity is felt, than if they were to undertake its attainment in advance. Again: when they attempt to draw the figure, they will be made sensible of the importance of a certain degree of knowledge of its anatomical structure; and thus, at every step, no matter how far they may extend the pursuit, they will feel, for ever, progressive wants, which must be progressively supplied. For all, however, there must be a secure groundwork; and that is a knowledge of the first principles of the imitative art. Once initiated, and made to feel the capacity of art, and the power they possess, its cultivation will not be a task, but constant and increasing delight. This must be done by small beginnings, by securing success, by not attempting too much, by a knowledge and capacity of its application to practical results, gradually acquired—

* The author has the gratification of finding this fact fully corroborated by the experience of an eminent teacher of New York, the Rev. W. Morris, rector of Trinity school, who, from actual experiment, has placed the matter in a light that can not fail to interest both parents and teachers. He divided his writing-class, without regard to any superior natural talent, or aptness, in his scholars, and allowed "one half the class to write every day in the week, as boys usually do in school, and the other half wrote and drew on alternate days. The result produced an average of five to one good writers, in favor of the drawing-class." A similar experiment any teacher can make, and it is well worth the serious attention of all.

a better and surer system of rapid instruction than any other that can be devised. One simple straight, or curved line, drawn with accuracy, and the beginning is made; and a habit of observation of forms, and their imitation, is induced, which gradually leads from small to greater efforts. Wants are felt at every step; and their supply is naturally sought by like means that have given strength to reach the point already attained. The eye, the mind, and hand, keep pace with each other, in the march of improvement; and the increase of knowledge and capacity impels to higher attainments and insures results, which never can be reached by a course of superficial instruction, having only for its object the production of a drawing or picture—the joint labor of master and scholar—of which the former has, too often, far more than his share.

113. What can a pupil have learned, to advantage, who can do nothing without his drawing-master by his side? And to what useful purpose can the little knowledge he may have thus acquired, in his lessons, be applied in after-life? It has been by such systems of superficial instruction, that drawing has been abused, and reduced in its consideration as a useful art; and, to say the truth, it is useless enough, when thus perverted from its high and valuable purposes. Such systems are worse than useless: they are evils, which go far to retard the cultivation of true taste, not only in art itself, but all those refinements which centre in it; and the sooner a reformation in our schools is begun, the sooner will a more healthful influence be seen and felt in society. We are not to look solely to teachers, for a remedy of the evil: for, unfortunately in this, as in everything else, the market will be, necessarily, supplied according to the nature of the demand; and, unless parents and pupils can be made sensible of the importance of a proper system of instruction, and of the advantages to be derived therefrom, teachers battle against windmills, and will get for their pains the reward of the knight of La Mancha, in their most sincere and honest exertions. The work of reformation is no untried experiment. Abroad, the diffusion of judicious education in design, largely and freely distributed throughout all classes of society, has proved, not only how easily it can be done, but with what favorable results; and it is time an effort should be made in America, at least to keep pace with, if not to lead, in the march of the onward century in which we live. Surely, we will not admit the existence of national incapacity. From a land abounding with the beautiful; with genius, wealth, enterprise, and freedom, much may be expected, and much may be achieved: and should be, in this, as in all that tends to elevate its national character and importance.

114. Whatever the experience of the world may be, with regard to the necessity of coercion, and of forcing the youthful mind, by physical persecution, into the reception of knowledge, that

of art may safely claim to be an exception. All the powers of the earth can not force a love for art upon the mind, any more than they can "make the bird sing;" and without a love for it, its pursuit is hopeless. With some, the first impulses of their childhood have given evidence of its existence; with others, it has been developed by accidental associations, or other causes; and, with many, it has been buried for ever, for want of proper cultivation. Care should be taken, therefore, to temper the course of study, as far as possible, to the inclinations, as well as capacity, of the pupil; who, it often happens, when a difficult lesson is placed before him, or failure has been the result of his labor, either by attempting too much, or for want of proper preparatory knowledge, desires to try something less difficult—and he should be indulged: for it is far safer for him to retrace his steps, than advance too rapidly. If, in its application to other branches of education, the operation of such a system of instruction, so forcibly exemplified in the study of art, were more strongly impressed upon the minds of teachers; if the tree of knowledge were planted in more pleasant places, and the pathways to it divested of many of the thorns that lacerate the youthful mind and body, as both are driven forward, by which the learner is made, too often, to despise the end for which he labors, as heartily as the means of its attainment are hateful to him, blue-Monday would soon be stricken from the school-boy's calendar.

115. We know that, in the pursuit of art, if properly directed, there is an attendant enjoyment, constant and enduring, as boundless in its resources. We know that men have lived through almost a century of ardent devotion to it, and died still true to their first love; their lives presenting one continued, progressive attachment and devotion to its cultivation. If the world but knew the enjoyments of the devoted follower of art, they would be more eager to share them with him. To him—

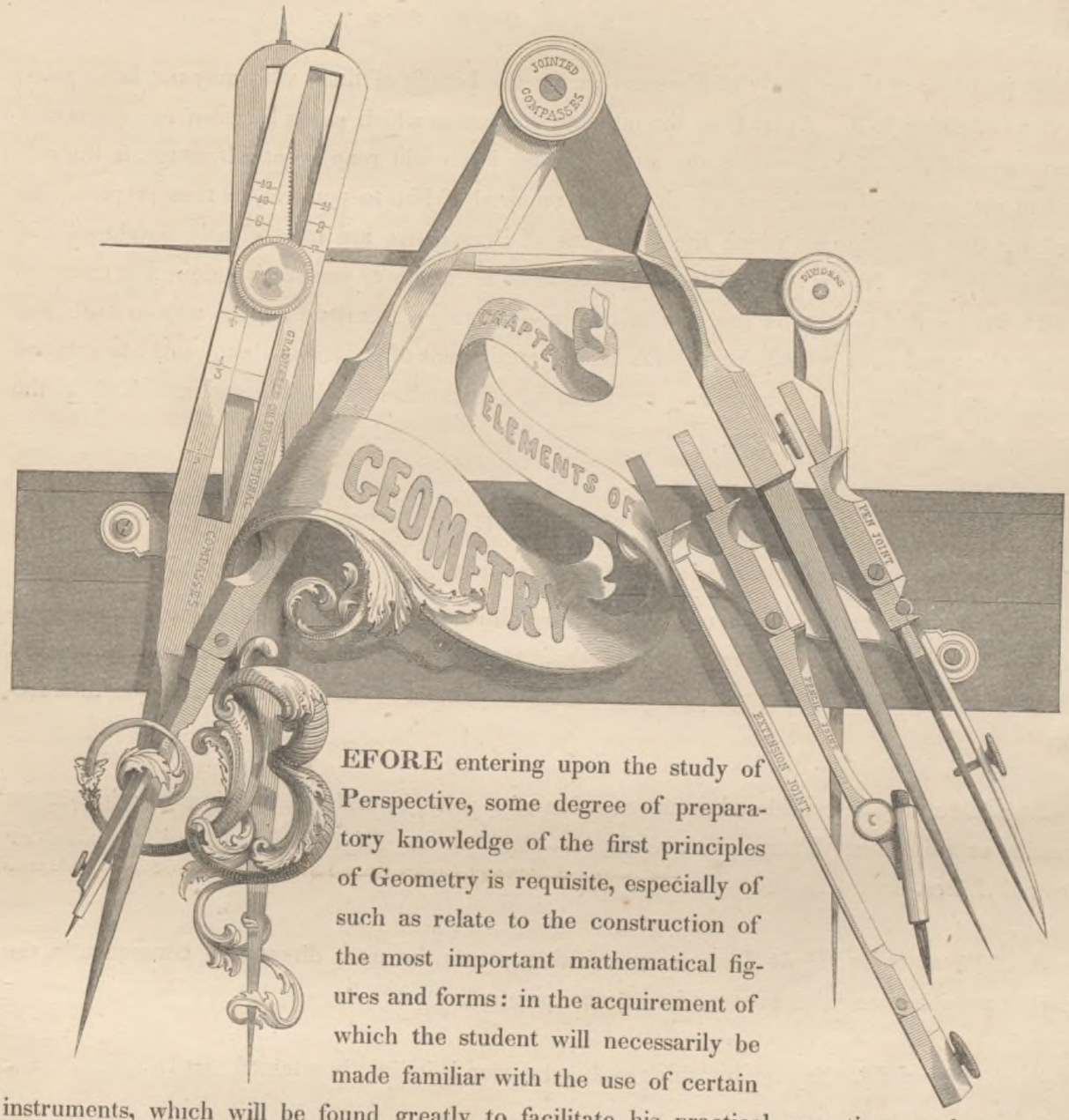
"No rock is barren, and no wild is waste;
No shape uncouth, or savage, but in place,
Excites an interest, or assumes a grace.
* * * * *
The dome-crown'd city, or the cottage plain,
The rough cragg'd mountain, or tumultuous main;
The temple rich in trophied pride array'd,
Or mould'ring in the melancholy shade;
The spoils of tempest, or the wrecks of time,
The earth abundant, or the heaven sublime:
All, to the Painter, purest joys impart,
Delight his eye, and stimulate his Art."
* * * * *

The most fruitful source of regret, and almost the only alloy to the enjoyments of the true artist, is the consciousness of want of power to reach that remote perfection, which ever recedes, as his strengthened perception capacitates him to follow it as his guiding-star: which shone as brightly, to the young imagination of Michael Angelo, and doubtless seemed nearer to him, in the days of his boyish efforts, than when, an old man, he sat musing, alone, among the ruins of the Coliseum, and replied to the Cardinal Farnese, who expressed surprise to find him there: "I yet go to school, that I may learn something." Then he had made his name famous throughout the world. Within sight, the towering dome of St. Peter's stood forth against the bright sky of his native Italy, the imperishable monument of his genius. The frescoes of the Sistine chapel, the wonder and admiration of that and succeeding ages, had been achieved. Almost at the close of a lengthened life, not unmixed with many trials and disappointments, still the love and devotion to his art burned as warm within him, as when, buoyant with youthful hope and energy, he left his parental home, at Caprese, to enter the school of Gherlandaio—to learn to draw. It was this that had sustained him, and made him what he was; and, it must be thus that excellence in art is to be wooed and won. It is this that must be cultivated, and kept alive for ever, in its pursuit: and it can be done—nay, more—even where its existence may appear to be doubtful, and almost hopeless, it may be developed by proper culture. It is an attribute bestowed on all, in degrees of capacity for its cultivation, as in all other gifts with which the Creator has endowed the perfection of his works, immortal man, and should, no more than they, be neglected.

116. In concluding the elementary portion of this work, it is hoped that the effort to place before the American public a popular system of instruction in the first principles of design, however incomplete it may be, may have a tendency, not only to awaken an interest in the subject, but to show, at the same time, how easy it is to learn to draw. Let those who desire to acquire this beau-

tiful and valuable art, but give proper attention to the principles and practice recommended, not by a few hasty trials, but by carefully following the routine of advancement, from a simple straight line, to the point now reached; and all that they have yet to do, will be both plain and easily acquired. As a primary and elementary work on drawing, our task is done; and it will not be in vain, should it reach, in a degree, however small, the wants of a people always susceptible of conviction, and ready to promote the advancement of the arts of refinement. The art of drawing claims more than this: for it is essential as a part of common education. It belongs to the artisan, even more than those who live in the easy enjoyment of fortune: with the one, it may be classed as a luxury, or source of recreation; to the other, it is a necessity.

Let this useful and beautiful art, therefore, no longer be considered as a mystery, confined to a gifted few, but take its place with its sister arts, in our systems of general education. The young and tender capacity is early prepared for it; its first impulses are harmonious with it; and, while it may be made to shed gladness and sunshine upon the hours of coercion to the school-bench; when the mind is for ever wandering from the primer to the bright fields, and scenes, and objects, of childhood's joys, its pursuit leads not from, but in the direction of, all other knowledge, assists in its acquirement, tends to strengthen the mind, and purify the taste, and bestows a capacity for intellectual pleasure, apart from its practical utility, that should give it place among the first requisites in common, as well as finished education.



BEFORE entering upon the study of Perspective, some degree of preparatory knowledge of the first principles of Geometry is requisite, especially of such as relate to the construction of the most important mathematical figures and forms: in the acquirement of which the student will necessarily be made familiar with the use of certain instruments, which will be found greatly to facilitate his practical operations, and, to which, although it may not be absolutely necessary to have constant recourse, still, the surest way of learning to do without them, is first to acquire a practical knowledge of their use and value. Although, all the rules and principles of Perspective are, in truth, based upon and connected with Geometry, it will be sufficient that the artist and off-hand draughtsman should understand so much of that science as may be immediately connected with his art, without entering into the more laborious investigation of causes and effects, however interesting and productive of mental strength may be its further pursuit. It will, therefore, be only necessary to present a short chapter on this

subject preliminary to the study of Perspective, for the benefit of those who may not have given previous attention to it. Apart from the intimate connexion which exists between the science of Geometry and that of Perspective, the student of the latter will reap great advantage, in the subsequent mathematical operations, which will be required of him to perform, in thus preparing his hand for that precision by which the principles of Perspective are most clearly developed, and made intelligible. Nor is its importance limited as an accessory to perspective alone, but extended to all branches and degrees of the arts of design—clearing obscurity from the way to truth, and storing the mind with reliable expedients in the attainment of its ends—increasing its creative strength, and adding to its power and readiness of communicating its impressions. This is the business of education in Design.

ELEMENTS OF GEOMETRY,

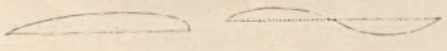
NECESSARY TO BE UNDERSTOOD, PREPARATORY TO THE STUDY OF PERSPECTIVE.

1. A POINT, as geometrically understood, has neither length nor breadth—parts nor magnitude—still it is necessary, in practical operations, that it should be definitely expressed—which is most generally done by a simple *dot* (.)—a slight puncture—and often by a simple intersection (× +).

2. A LINE may be considered as an extension of a point, by which it acquires length, without breadth or thickness. There are two kinds—*Straight or Right Lines*—and *Crooked or Curved Lines.*

3. *A Straight*, or *Right Line*, is one which presents the most direct, and consequently, the shortest possible connexion between its extreme points . .

4. *A Curved Line* is one by which such connexion is indirectly attained

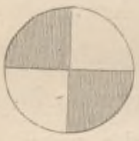
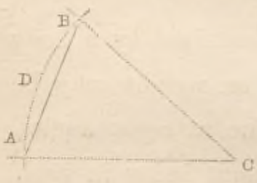


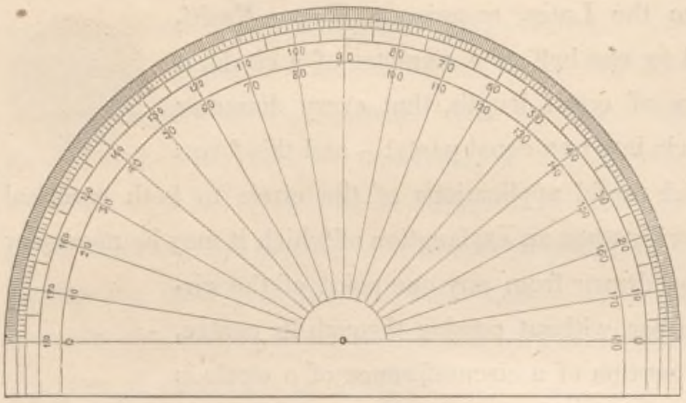
5. A CIRCLE is a form produced by a line, called its *Circumference*, sweeping around a point called its *Centre*, and always at equal distance from that centre. The *Circle* itself is too often confounded with its *Circumference*, whereas, the circle, geometrically considered, is the space limited by and embraced by the circumference. A fence may be as properly called a field as a circumference a circle.

6. The *Radii*, or *Rays*, of a circle, are direct or right lines drawn from its centre to its circumference: *Radius*, from the Latin, meaning a *Ray*—*Radii*, *Rays*. A radius being equal to one half of a diameter of a circle, it is evident, as all the radii are of equal length, that every diameter must necessarily divide the circle into two equal parts:—and this forms the basis of one of the most important and useful applications of the circle to both practical geometry and Perspective—previous to entering upon an explanation of which it may be necessary to observe—If a right line be drawn from any one point of the circumference of a circle to another, without passing through its centre, it is called a *Chord:* and any portion of a circumference of a circle is called an *Arc* of such circle:—and, further, a right line connecting, or giving the measure between the extreme points, or terminations, of an arc, is the chord, or measure, of such arc—such chord, or measure, having reference to such portion of the whole circumference as such arc, and consequently its chord, may represent. This leads us to the requirement of an approved method of measurement of the circumference of a circle.

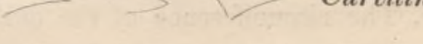



7. The circumference of the circle has been divided into 360 *Degrees*, or parts; and for purposes of still nicer calculation, each of these degrees has been subdivided into 60 *Minutes*—each minute into 60 *Seconds*, etc. If, therefore, we take 360 degrees, as the measure of the circumference of a circle, and divide it into four equal parts, each part must necessarily contain 90 degrees; and if two diameters be drawn connecting the points of these divisions, they will divide the circle into four equal parts. Now, when two lines meet or intersect each other, as in the case of these two diameters, they form a space between them which is called an *Angle;* the point of their contact or meeting (C) being called the *vertex* of the angle, and the chord of an arc described from the vertex, as a centre, drawn between the points where this arc touches, or cuts the lines forming the angle, will be the measure of such angle. Thus, for example, the chord (A B) of the arc (A D B) gives the measure of the angle (B C A) formed by the lines A C—B C. If, therefore, we divide a circle as above shown, into four equal parts by two diameters, they form at their central intersection *four* angles of 90 degrees each, which are called *Right angles;* half a right angle being, of course, 45 degrees. An angle which exceeds 90 degrees is termed an *Obtuse angle*, and that which is of less than 90 degrees an *Acute angle.*

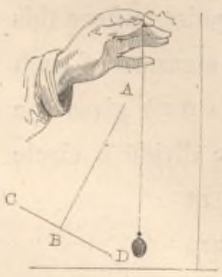



8. To facilitate the operations of the practical geometrician, an instrument for the ready measurement and adjustment of angles, called a *Protractor*, will be found of much service. They are often made of brass, but still better, and far more serviceable for the draughtsman, of transparent horn; which enables the operator to adjust it to given points and lines with the utmost facility and accuracy, as well as to produce, or reproduce, angles of any given extent, or measure, at will. With regard to its application, and method of using, the annexed figure will sufficiently explain, as well as admirably exemplify, the principles involved.

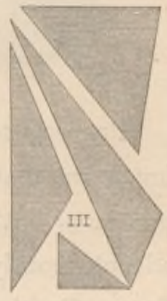
9. Angles formed by the contact, or connexion, of two right lines are called *Rectilinear Angles*, and those formed by curved lines  *Curvilinear Angles.*

10. The Line of the Horizon is known as that which bounds the margin of the heavens to our view, best and most geometrically demonstrated by that which limits our view of the distant ocean; hence, a line lying in the same direction, and parallel to the natural horizon, is called a HORIZONTAL LINE.

11. The true VERTICAL, PLUMB, or PERPENDICULAR LINE, is such as is described by a body falling to the earth, or by a string to which a plummet or weight may be attached, and which must, necessarily, meet a horizontal line at right angles. Nevertheless, one line may be perpendicular to another, without being in itself a natural perpendicular, or vertical, but assuming that quality, from its relation to such other line. For example, A B is perpendicular to C D, although in itself not vertical, or perpendicular to the earth or natural horizon. These distinctions must be borne in mind in the study of perspective.

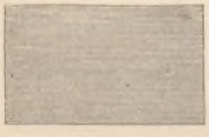


12. As lines are limited and defined by points, so are figures limited and defined by lines. No less than three straight lines can possibly embrace a figure. These are called TRIANGLES, having three sides and three angles. They are of three kinds: I. The *Equilateral triangle*, having its sides and angles equal to one another. II. The *Isosceles triangle*, having two equal sides and two equal angles. III. *Irregular triangles*, from their having their sides and angles irregular. To which is sometimes added the *rectangular triangle*, having one of its angles a right angle, although, strictly speaking, it belongs to the II. and III. classes.



13. A SQUARE is a figure having four equal sides and angles—all its angles being right angles. A line connecting its opposite angles, and dividing it into two equal parts, is called its *Diagonal*.

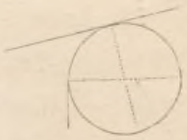
14. A RECTANGLE has its four angles, right angles, and its opposite sides, equal to one another, but unequal to the other two. Like the square, it is also divided into two equal parts by its diagonal. But, it should be remembered, that, in operative perspective, the diagonal of the rectangle possesses far different properties from the diagonal of the square, as will be hereafter more fully explained.



15. All figures formed by angles come under the general denomination of POLYGONS, and those of more regular and balanced proportions are designated as follows:—

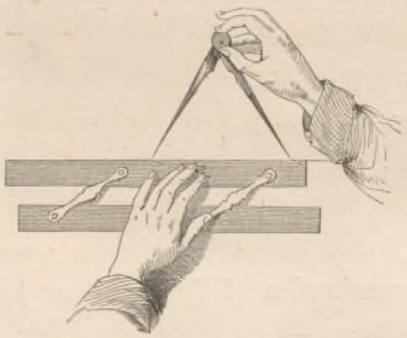
16. AN ELLIPSE is formed by a curved line embracing a space which differs from the circle in the inequality of its diameters. It is commonly called an *Oval*, from its assumed resemblance to the form of an egg; which, however, differs from the true geometrical ellipse—being smaller at one end than at the other, and also in having its extreme breadth not in the middle; while the true ellipse is equally balanced in all its duplicate and relative proportions

17. A TANGENT is a line touching the circumference of a circle at a point, called its *point of contact*, where it forms a right-angle with its diameter.

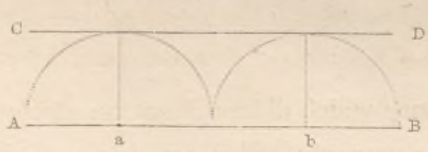


Properly to understand, and practically to apply, the rules and principles of perspective, it is important that the student should not only be able to form all these figures with mathematical precision, but also to comprehend the principles of their construction; in doing which, he may advantageously have recourse to a certain number of drawing instruments to facilitate his operations. On the initial page of this chapter will be found drawn the most generally useful of these instruments, and of the latest and most improved construction, although with an ordinary ruler, or straight-edge, and a pair of compasses, an expert hand may do very well.

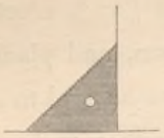
18. TO DRAW ONE LINE PARALLEL TO ANOTHER is most readily effected, at once, by the aid of the ordinary parallel ruler — an instrument which will always prove of service to the draughtsman, and the method of its application is so simple as to require no directions. It may be well, however, to observe, that where great accuracy is required in the adjustment of the parallel ruler, or any other ruler, or straight edge, to a given line, or to a given point or points, the aid of the compasses may be, in many cases, most serviceable. Thus, by placing the extended points of the instrument on the line, and bringing the ruler gently against them, as figured, the utmost certainty may be insured, provided the points of the instrument be well adjusted, which should be always the case.



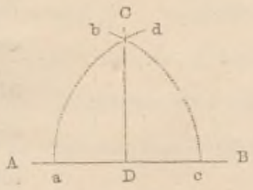
To draw one line parallel to another by a method more strictly geometrical — Open the compasses to the distance required between the lines, and from any point on the given line (A B), (say at a); describe as much of an arc as may be necessary; then select another point on the given line (say at b), and repeat a like arc. The tangent of these arcs will be the line (C D) required.



19. TO ELEVATE A PERPENDICULAR FROM A GIVEN POINT ON A GIVEN LINE. This may be done, at once, by the application of an ordinary rectangular triangle of wood, or even of card or paper, which will be found to be a useful accessory to the draughtsman for many purposes.



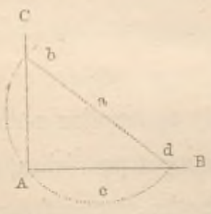
To do it, however, with the compasses, is, nevertheless, important to know. Suppose AB the given line, and D the point on which we desire to erect a perpendicular. From D measure off, with the compasses, two points (a——c) equidistant from D. Then, taking a and c as centres, describe as much of the arcs ad—cb as may be necessary to indicate their intersection; through which point a line drawn to D (as CD) will be the perpendicular required.



20. To DIVIDE A GIVEN LINE, BY ANOTHER, PERPENDICULAR TO IT, and of course cutting it at right-angles, is a process so similar to the foregoing, that it is only necessary to suggest the continuation of the arcs to a duplicate intersection, taking the extreme points of the given line as the centres for such arcs.

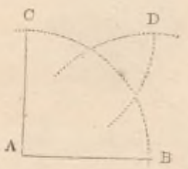
21. FROM A GIVEN POINT, TO DRAW A PERPENDICULAR TO A GIVEN LINE.—Let A be the given point, and BC the line to which it is desired to draw another from A perpendicular to it. From A, as a centre, describe an arc (ab), cutting BC in two points; then, from these points as centres, describe as much of the arcs cd—ef as may be required to secure the point of their intersection—whence a line drawn to the point A will give the perpendicular required.

22. AT THE EXTREMITY OF A LINE, TO DRAW ANOTHER PERPENDICULAR TO IT.—Let AB be the given line, and A the extreme point on which we desire to erect a perpendicular. Place one point of the compasses on A, and extend the other to any convenient point (say a). Then, from a, as a centre, describe an arc (bcd), cutting AB. Draw the diameter dab: a line drawn from A, passing through the point b, will be the perpendicular required.

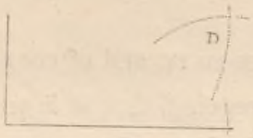


23. TO DRAW AN EQUILATERAL TRIANGLE.—Having (AB) the required measure of one of its sides, open the compasses to its extent, and, from its extreme points (A and B), as centres, describe as much of two arcs as may be requisite to secure the point of their intersection; from which point (C) lines drawn (to A and B) will give the required equilateral triangle.

24. To draw a square.—Having decided the measure of one of its sides (A B), erect a perpendicular (A C) on one of its extreme points, as just shown, and placing one point of the compasses on A, extend the other to B. Make A C equal to A B, and then, without altering the expansion of the instrument, from B and C, as centres, describe as much of two arcs as will give their intersection (D): the four points—A B D C—connected, will give the required square.

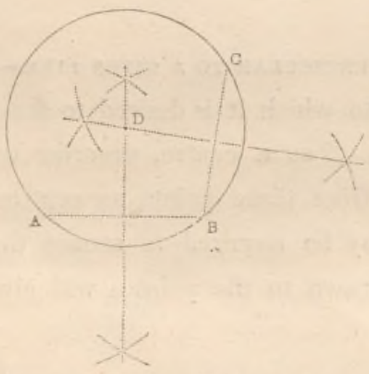


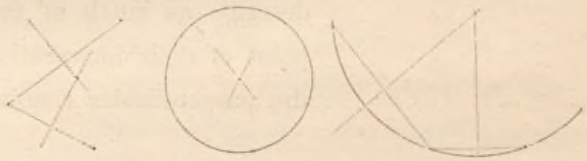
25. To draw a parallelogram—the process is the same as for a square, with only this variation, that it is necessary to change the expansion of the compasses to the measure of the longer and shorter sides, in ascertaining the point D.



To draw a circle with the compasses needs no direction.

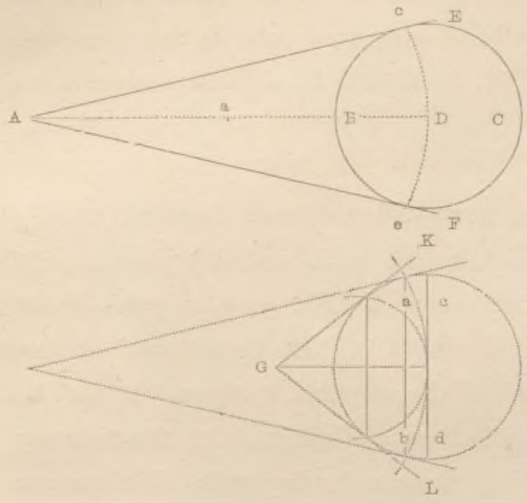
26. To find the centre of a circle.—Take any three points (as A B C) on its circumference, no matter where, and draw the cords A B—B C; divide these cords by lines at right-angles, or perpendicular to them, as figured, and the point of intersection of these lines will give (D) the required centre of the circle. By a like process, it is evident that a circle, or arc, may be drawn whose circumference shall touch any three given points, as shown in concluding examples.





27. To draw a tangent to a circle—might appear so simple as scarcely to require a rule; but cases frequently occur where it becomes necessary to ascertain, with the utmost precision, the *exact point of contact*, which may be thus verified: As there is no point in the circumference of a circle that may not limit a diameter, and a tangent must touch the circumference at right-angles to a diameter, a diameter, meeting a tangent at right-angles, gives its true point of contact. (17.)

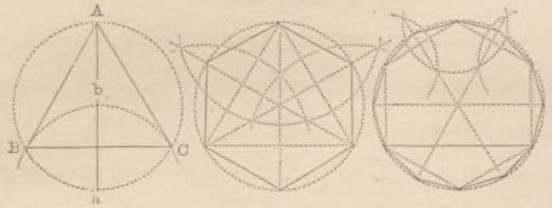
28. From a given point to draw two tangents to a circle.—Let A be the given point, and B C the given circle. From A draw a straight line to D, the centre of the circle; divide the line A D

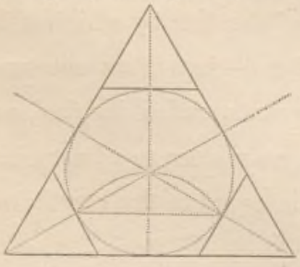


into two equal parts, at the point a; place the compasses on a, as a centre, and extending them to D, describe the arc cDe; and the points of intersection of this arc, with the circumference of the given circle, will give the true points of contact of the required tangents AE—AF.

It should be observed that the cord ab, which is the measure between the points of contact of the two tangents, is less than cd, the diameter of the circle; and the nearer the point, whence the two tangents are drawn, is placed with reference to the circle, the greater must necessarily be the difference between the measure of the cord giving the distance between the points of contact and the diameter of the circle, as shown in the tangents GK—GL, drawn from the point G, compared with former example.

29. To draw within a circle an equilateral triangle, hexagon, dodecagon, etc.—This operation consists in a simple division of the circumference of the given circle into *Three*, *Six*, and *Twelve* equal parts, etc. First, therefore, for the *Equilateral Triangle*, draw a diameter (Aa); then from a, as a centre, describe an arc (BbC), passing through the centre of the circle; and the points where this arc cuts the circumference of the given circle, at B and C, will give its required division into three equal parts, and ABC, the equilateral triangle required. *To trace a Hexagon*—the radius, or half-diameter, will give the true measure of the divisions of the circumference into six parts. *For a Dodecagon*, divide one or more, if necessary, of the ascertained sides of a hexagon, as figured, etc.

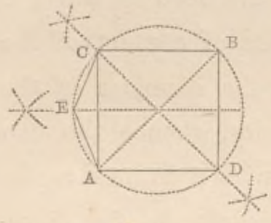




30. To draw either, or all of these figures, as well as such-like that follow, *outside of the circle*, the process is so similar that it will be only necessary to figure the *Equilateral Triangle* and *Hexagon* thus produced, and leave the student to exercise his ingenuity and practise his hand upon such others as he may have occasion to draw; in doing

which, it is advisable that he should draw them much larger than the examples here given, so that the slightest deviation from the utmost accuracy may be at once apparent. It is not enough that he should know how such figures may be drawn, but he should be able to produce them himself at will.

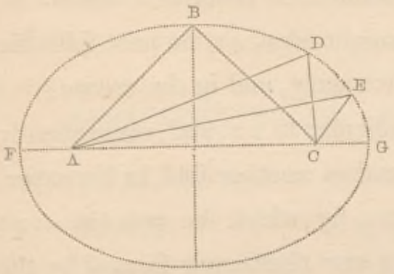
31. WITHIN A CIRCLE TO DRAW A SQUARE, OCTAGON, ETC.—First draw a diagonal (as A B); intersect it by another (C D) at right-angles to it, and the points, A B C D, will give the corners of the square required. ***For an Octagon***—divide one of the sides of the ascertained square (A C), as figured, and A E—E C will give the measures of the sides of the required octagon. It may be here observed, that one of the readiest ways of ascertaining the accuracy of a square or rectangle (14), is to measure its diagonals. If these are found to be unequal, neither the square nor rectangle can be correct.



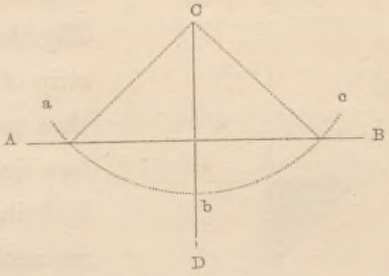
32. WITHIN A CIRCLE TO DRAW A PENTAGON, DECAGON, ETC.—First divide the circumference of the circle into four equal parts, as shown in the foregoing example, then take any one of the radii, or half-diameters of the circle, and divide it into two equal parts (as at the point a); on this point (a) place the compasses, and extending them to C, strike the arc b C c, cutting the diameter A B at c. Then, placing the compasses on the point C, extend them to the intersection (c), and describe the arc d c e. The points, where this arc cuts the circumference of the given circle, connected to C, as figured, will give two sides of the required pentagon; which ascertained, the remaining three sides are easily defined.

A pentagon, or even one of its sides, once obtained, the process of producing upon its basis a ***Decagon***, as shown in the second example, needs no further explanation.

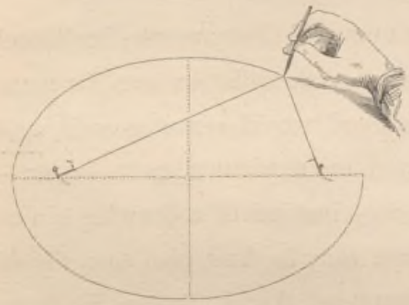
33. TO DRAW AN ELLIPSE with the compasses is extremely difficult, and the process, at best, is complicated, uncertain, and unsatisfactory; for, there are no portions of the line by which it is formed that exactly corresponds to a true arc of a circle. It has been found that there are two points on the longest diameter of an ellipse, equidistant from its extreme points, called its ***foci***, or ***focuses***, which, if connected by two lines meeting at the circumference, no matter to what point on the circumference they may be directed, the sum of these two lines is equal to the length, or



longest diameter of the ellipse. Thus (as first figured), AB—BC, AD—DC, and AE—EC, will be found severally equal to the diameter FG. To ascertain these important *points:* having first decided upon the length

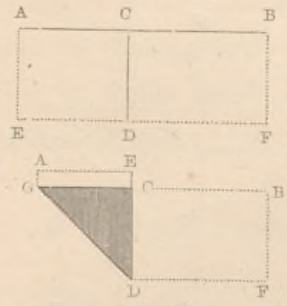


and breadth of the required ellipse, as AB—CD (in the second figure), and drawn these two diameters, bisecting each other at right-angles, take the measure of one half of the longest diameter (AB) with the compasses, and from the point C, as a centre, describe an arc (abc). The points where this arc cuts the diameter AB, will be those required. Now, by placing two pins in these points, and stretching a thread between them, passing over another pin at the point C, we have, as it were, a moveable line, equal to the length of AB, which will accurately guide a pencil in describing the required ellipse (as figured in the third example). Or, we may regulate the length of the string at once, by the required length of the ellipse, and, by doubling it, get the position of the required points on the long diameter, as well as making it serve in the after process. Ten minutes' practice will make the operation familiar to the draughtsman.



34. It should not be understood that the methods here given are to be considered so far arbitrary as to exclude others in common use, that may be equally as efficient, and the student will doubtless often have occasion to exercise his ingenuity in finding ready expedients, in the course of his practice, and in none more so than in supplying the place of instruments. It is well enough, when practicable, to have all such facilities; but it is equally well to know how to do without them, especially for the off-hand draughtsman, who can not always have his magazine of tools by him, and who often finds in a stout piece of paper all he absolutely needs for the spon taneous manufacture of such aids as he may require at the moment, and thus he sets to work.

35. First, for his ***Straight-edge***, or ***Ruler.*** If he does not find the edge of his paper sufficiently accurate, he folds it neatly over, runs his thumb-nail along the crease to give it sharpness and firmness, and has, at once, not only the ruler he requires, but, by folding, refolding, and a little dexterous use of his penknife, soon learns the value of his expedients, and, in a measure, to do



without his case of instruments. If, for instance, he requires a ***Square*** or ***Right-angle*** (19): Having secured his straight-edge, A B, he next folds his strip of paper neatly over, so as to double it evenly, and in the crease (C D) thus produced, he has a line (C D) perpendicular to A B, and consequently two right-angles (A C D—D C B). He now makes another fold in his paper, by bringing the edge (E D) evenly on to D C, by which he gets (in G C D) an accurate rectangular triangle—having one right-angle formed by the edges G C D, and two half right-angles formed by G D C and D G C; and with this simple piece of paper, almost every rule of practical perspective may be worked out. On its edges he may mark his measurements, and by its folds he can define his lines and angles, not, perhaps, so readily as with the scale and compasses, but still with sufficient accuracy for ordinary purposes.

36. Many a one who has been accustomed to rely entirely upon his instruments, has found himself in difficulty to draw a circle, or describe an arc, for want of his compasses, when a bit of thread would serve as well, and in many cases, especially when used on a picture, even better—where the finger may be made to serve instead of a drawing pin or point. For a like purpose, recourse may be had, also, to a slip of stout paper, or card, with this advantage, that it is less likely to stretch than the thread; and, moreover, when circles or arcs of different radii have to be often repeated, the holes (1, 2, 3, 4, 5, as figured) in which the pencil-point is to be inserted, render such repetition more easy.

After all, however, it must be admitted, that, to be capable of taking advantage of such expedients, the draughtsman should first know the methods of construction of geometrical forms by means of the instruments which experience has required and approved; and not merely for the facilities they afford, but the elucidation of the principles of construction which are thus made more clearly evident and impressive.

CHAPTER VI.

PERSPECTIVE—ITS PRINCIPLES, RULES, AND PRACTICAL APPLICATION.

PERSPECTIVE is an art which develops the principles, and fixes, by established and certain rules, the practical methods of representation of that diminution of objects to the eye, in proportion as they are more or less remote from the observer, which is so evident to all—an art, without which the draughtsman must for ever wander in uncertainty and error, while in its knowledge he secures a faithful and unerring guide. To all, whose occupations may be in any way connected with design, it is as important an auxiliary as to the artist it is indispensable. Apart from its importance in a practical view, its knowledge may justly be regarded as worthy of high consideration in the purposes of general education; for, surely, the design of education

should extend to all that tends to the elucidation and perception of truth, and that qualifies the senses for its faithful impression on the mind.

37. PERSPECTIVE may be considered as a Science and as an Art: as a science, in the investigation of the principles upon which is based its theory—as an art, in the mechanical or mathematical operations, by which we reach the truthful representation of any object or objects we desire, in any position or at any distance from the observer or from one another, at which such may be visible to the eye.

38. Perspective admits of yet another division, viz.: *Aerial* and *Linear*. Aerial perspective has reference, more particularly, to those peculiar atmospheric and other influences, by which objects, more or less remote, are affected in color, light, shadow, and gradation of tints, according to their distances or relative position; the rules for which are best acquired by close observation and study of nature, less reducible to systematic methods, and to the beginner of less practical importance, than linear perspective, a knowledge of which forms the best basis for its study. In its place we shall have occasion to refer to the subject of aerial perspective; our business, at present, with the art, is more directly as a linear operation. First, therefore, should the pupil learn to look at nature with an eye capable of the comprehension of the principles of the art therein so beautifully and clearly developed; and, next to the application of these principles to practical results, by which the representation may most nearly approximate to the truth of the reality. In all this there lies no mystery. The precepts and principles of the art are few and simple; although capable of endless elaboration and application, based in truth, they never vary from it. If the learner will go to the work in the same spirit which has been required of him in all that he has thus far acquired—when he can understandingly place a single *point* or *line* in perspective, with a perfect knowledge of the why-and-wherefore of the operation—he is safely in the way to pursue the more elaborate and various applications of the art with certainty, and the task may be thus overcome at the outset.

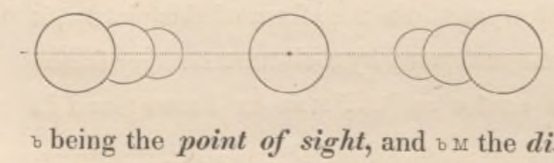
39. As preparation for the course that lies before us, let us consider the few technicalities that have been assigned to the art; for of these, few as they may be, more is required than mere familiarity with their names. If we dwell more on this subject than may be deemed necessary by those already familiar with the art, again let such be reminded, that our ambition reaches not to the teaching of the learned, but our highest aim is to make plain and simple the first steps of knowledge to the unlearned; and, reverting to our own experience, we are not ashamed to confess

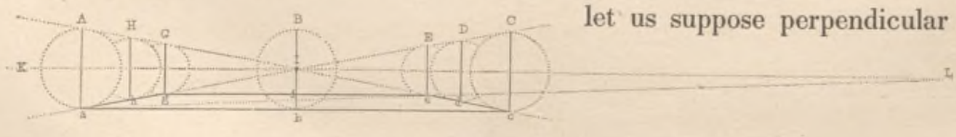
how long, tedious, and dark, were the labors of our beginning, through volumes of abstruse diagrams and mathematical operations, for want of clearer light and more practical exemplification at the outset. Nor have these deficiences, not to say errors of the books, been confined in their operation to our own experience, but generally confessed. ("After having studied Perspective at Rome, under an excellent professor of mathematics, and after having filled more than five hundred pages, in folio, with drawings and figures in perspective," says Valenciennes, an eminent French artist, and author of one of the best works extant on the subject of Perspective, "I may have been allowed to have considered myself thoroughly proficient in that science. But, on my arrival in Paris, having shown my work to my friend Joseph Vernet (the celebrated landscape painter)—'I see very clearly,' said he, 'that you have learned perspective, but I also see as well that you do not understand it. Be not alarmed,' he continued, seeing my surprise; 'you know enough that I can explain it to you in a single lesson,' and this he did."—) But back to ourselves, and let us not become involved in geometrical labors until we can comprehend the end to which they may conduct us. Let us look to nature for our first lessons, and evidences of the principles of the art, and then to the books to teach us the means of their practical application in our representations.

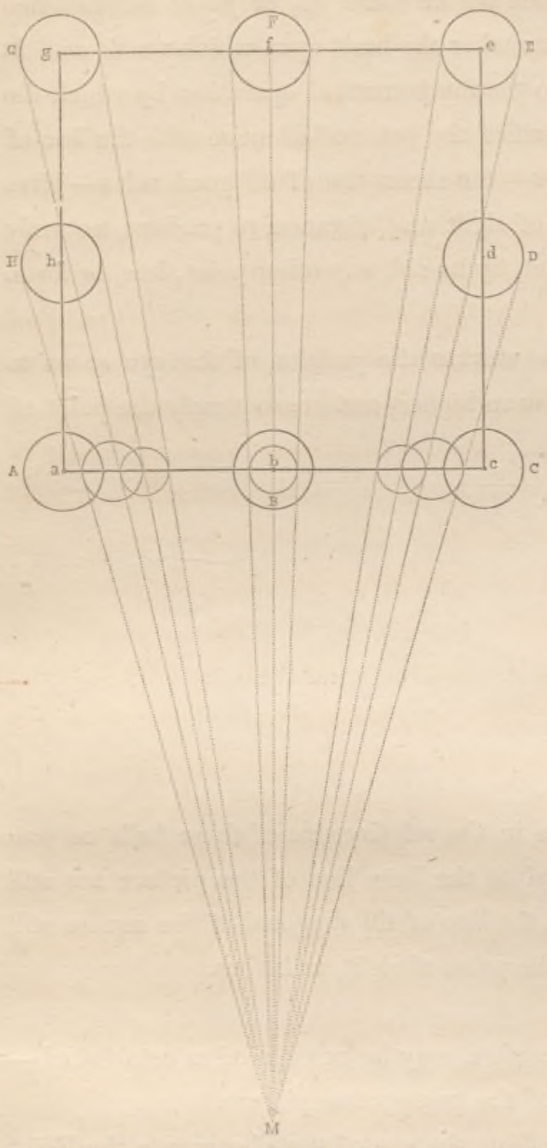
40. When the eye is directed to any view or scene in nature, it embraces no more than most agreeably fills its power of vision. This is *the picture* impressed on the mind through the organ of sight. It is the business of the art of perspective truthfully to represent this picture; and, even if it be an ideal creation, the rules and principles that govern its production are still the same. Now, as to the true form of this picture, it would most naturally be embraced by a circular limit, or frame, having, of course, its *centre* as its POINT OF SIGHT; and in

whatever direction the eye may be turned, this *circular* picture will be presented, its centre, or *point of sight*, naturally moving with it. But custom, and other considerations not necessary to dwell upon at this time, have given more generally acceptable forms to pictures, such as the *square*, the *parallelogram*, the *ellipse*, etc. Whatever be the form of the *artificial*, it must still be considered as but a portion of the *natural* picture, which distinction the examples just given will more fully explain. It is important that this distinction should be impressed upon the mind of the student of perspective; for, perspectively considered, ***the point of sight must in all cases be in the centre of the picture***, although it does not follow that it should be so in regard to such portion thereof as we may desire to embrace within the limit or frame to which we prescribe ourselves in our graphic representation. Still, however, this privilege which we assume should be kept within the limits of propriety; and we certainly exceed them when we carry our point of sight *out of the picture*, as we more closely approach them by placing it near its centre. To see a view or object, the eye must be directed to it: if so, its point of sight must be upon it; and Art must recognise the laws of Nature to harmonize with her in her impressions on the senses and thence to the mind.

41. Referring to the example on the next page—Let us suppose a square (a c e g) described upon a table, or board, placed in a perfectly level or horizontal position, and that eight balls of equal size (A B C D E F G H) be placed upon its four corners and divisions, as indicated—and let us, for the sake of elucidating the principles involved more clearly, imagine these balls to be transparent. If the eye were placed at a point, on a level with the centre of these balls (as at M), so that the centre (b) of the ball B would exactly cover the centre (f) of the ball F, as indicated by the line M b f, the several balls would appear in their relative positions and proportions compared with the three (A B C) nearest to the eye, as thus exemplified; b being the ***point of sight***, and b M the ***distance of view***—the ball F being covered by the ball B, and only the balls A B C exhibiting their entire outline, or circumference—the imaginary line passing through their centres expressing the true and natural LINE OF THE HORIZON; that is, a line on a level with the eye of the observer, which must necessarily pass through the point of sight. Now, let us suppose perpendicular lines drawn through the centres of these balls, they will evidently give the points (a b c d e f g h) which correspond, exactly to the corners and divisions of the original square in their true per-





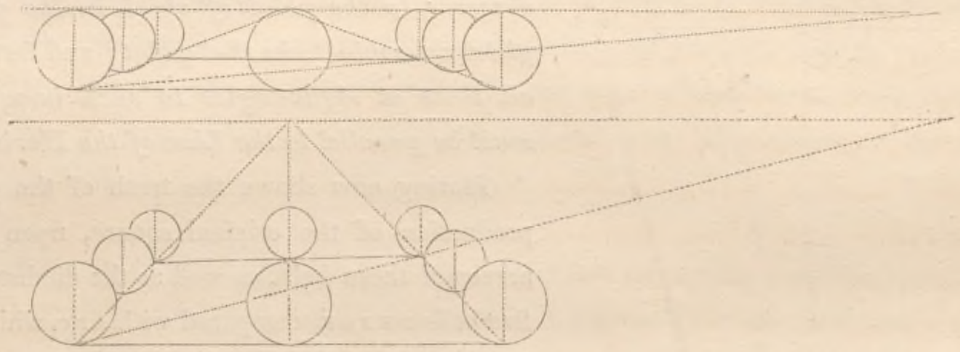


spective position; and consequently a c e g gives the true perspective representation of such square—the lines, or sides (c e—a g), terminating, if continued to an intersection of each other, in the centre of the ball B, as it appears in the perspective picture—which point corresponds to the point I, the *point of sight*, as just shown;—the sides (a c—e g) of the square being parallel with the line of the horizon (K). Hence it is evident, that—*All lines running parallel with an imaginary line drawn, from the eye of the observer to the point of sight, in the perspective picture, terminate in that point*; and farther *that—all lines at right-angles to such imaginary line must be parallel to the Line of the Horizon.*

Having now shown the truth of the perspective production of the original square, upon which we arranged these balls, as well as the diminution of the five balls D E F G H, compared with A B C, which we have represented of the size of the original scale—as resting on the front line of the square, which corresponds with the Base or Ground Line of the perspective picture. We are led at once, while these diagrams are before us, to the consideration of one of the most beautiful exemplifications of the accuracy of the art, and its application to practical results. If we extend the line of the horizon on either side of our perspective picture, and draw the diagonals of the square thus perspectively represented (as in second example), and farther continue the lines of such diagonals to their intersection with the line of the horizon, on either side of the point of sight, we will find the point of their intersection (L) with the line of the horizon, to be exactly distant from the point of sight—corresponding with the distance of the observer from the *base* or *ground line* of the picture; that is, that the distance from I to L (in the second example before us) corresponds exactly with the distance from M to b, as above shown in the representation of the actual position of the eye, as well as of the square and balls in question. The distance, therefore, between I and L, in the perspective picture, truly repre-

sents the DISTANCE OF THE PICTURE. Hereafter, when we measure off, or *point* our assumed *distance*, on the line of the horizon, the pupil must remember the basis upon which we do so. It would be a long, though an agreeable task, to enter into the mathematical operation by which the *diagonal* of the square, placed in perspective, thus verifies the point of distance with the line of the horizon and point of sight; and, working both ways—the surest test of all good rules—gives us the means, from the known data of the real point of sight and distance, to produce, not only an accurate perspective representation of the square, but, by its aid, any other point, line, or form.

42. If, without increasing our distance of view, we elevate the position of the eye so as to bring it on a level with the top of the eight balls, or even higher, and consequently the point of



sight and line of the horizon with it, no change occurs in the relative size of these balls as presented to the eye; the sides of the square lying parallel to the base line of the picture are still of the same length, the point of distance is unchanged, the line of the diagonal of the square still directs to it, and the lines of the other sides vanish in the point of sight, as before.

43. These important and elementary principles, therefore, may be considered as established—

I. The Point of Sight must be in the centre of the perspective picture.

II. All lines parallel to an imaginary line drawn from the eye of the observer to the Point of Sight, must terminate or vanish in that point.

III. The Line of the Horizon must necessarily rise or descend with the position of the eye, and consequently with the Point of Sight.

IV. The Base or Ground Line of the picture, and all others parallel with it, must be parallel with the Line of the Horizon.

V. The Diagonal of the Square, perspectively represented, directs to a point on the Line of the Horizon—the distance from which point to the Point of Sight represents the true Distance of the eye of the observer from the picture.

Upon these are based all the leading principles and practical operations of Perspective, in the perfect comprehension of which the pupil may consider himself fortified with all the mysteries of the art. So important may they be justly considered, both as regards the clear perception of their evidence in nature, and their practical application to art, that we return to them again; and in doing so, look again to nature for their illustration and verification.

44. Let us suppose an observer to sit at a prescribed distance from a window, and occupied in drawing the view without—which, as it suits our purpose better, we may imagine to be that of a street running directly from, or at right angles to the window. Observe that the eye is on a level with the first bar of the sash of the window: this bar, therefore, is equivalent to our *line of the horizon*; and the point on this line directly opposite to the eye is the *point of sight*—to which point the lines of the eaves of the houses, those of the street (supposing it to be level), and all others running parallel to them, or at right angles to the window, in the natural picture, are directed in their receding terminations (41); thus, assuming the frame of the window as that of our proposed picture or drawing, we have the first bar of the sash as our *line of the horizon*—the *point of sight* defined on that line—the distance from the eye to that point—the *distance of the picture*, etc. But the point of sight is not in the centre of the picture, embraced by the window-frame; still it must be the centre of the *perspective picture* (40), our picture or drawing being only a portion of the field of vision embraced by the eye.

45. This leads to the consideration of, if not a palpable error, at least an unwarrantable violation of perspective truth, too often committed by draughtsmen, and even by artists, whom we know not to commit such error for want of knowledge, but from sheer carelessness, or unnecessary sacrifice of truth, to gain certain ends, perhaps, in the composition of lines and masses, which might as well be obtained without such sacrifice. Thus we sometimes see the point of sight assumed on the very edge of the canvass, or border of the picture, and even entirely *out of the frame of the picture*. It must be evident to all, that the eye instinctively seeks a point to view a picture, whether it be in nature or art, under which it receives its most agreeable impression, and not only this, but where the delicately-constructed organ of sight may with least effort receive such impression. If, therefore, the eye must necessarily be directed to the picture, the point of sight can concentrate

nowhere else than within its frame somewhere, and as near its centre as possible, especially with reference to its horizontal breadth; for it is manifest that the farther we remove the point of sight from the centre of our picture, the farther do we lessen that harmony between nature and art which should ever exist. When we have exhausted all the power of art, there is enough left in which we fall short, without diminishing our resources by wilful and unnecessary perversion of truth. Would it not be absurd to imagine that any one desiring to look at a view through a window, should direct his sight anywhere else than within its frame? What right have we, therefore, to assume a larger liberty in our representations of nature?

46. With regard to the elevation and depression of the *point of sight*, and *line of the horizon*.

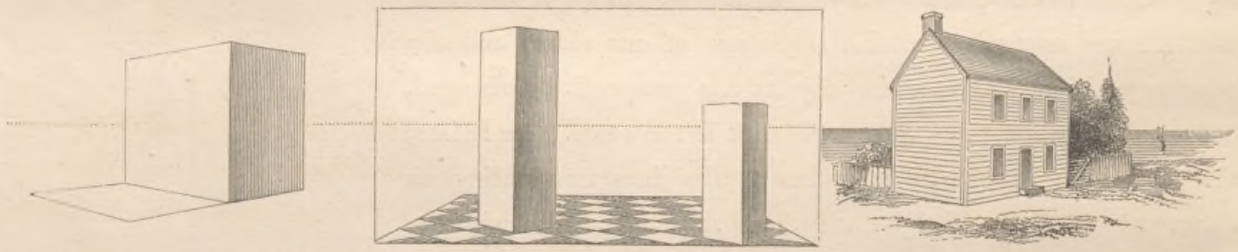
Let us imagine ourselves upon the seashore, our eye on a level with that of the first figure in the example before us. The line that limits our view of the ocean answers to our line of the horizon; it is on a level with our own eye, as well as his, and touches all other points or objects of the same height; we can not see the deck of the small fishing-boat ashore, and the hull of the distant ship rises above it. But, we climb the cliff, until we come on a level with the standing figure on the rock in shadow. The line of the horizon follows, as it were, our movement: we now see the deck of the small vessel ashore, and the round tops of the ship range with the horizon; one small vessel near the ship becomes more visible, and another, which was before hidden by the rock in shadow, is seen. We climb still higher, until we reach a point on a level with the highest figure in the examples; the line of the horizon ascends with us, and, on the smooth surface of the tranquil sea, we have, as it were, a vast perspective plain, defined by an actual line,

which is the line of the horizon—on which line must be our point of sight, corresponding, in our perspective picture, to our actual point of view, being directly facing, or opposite to it.

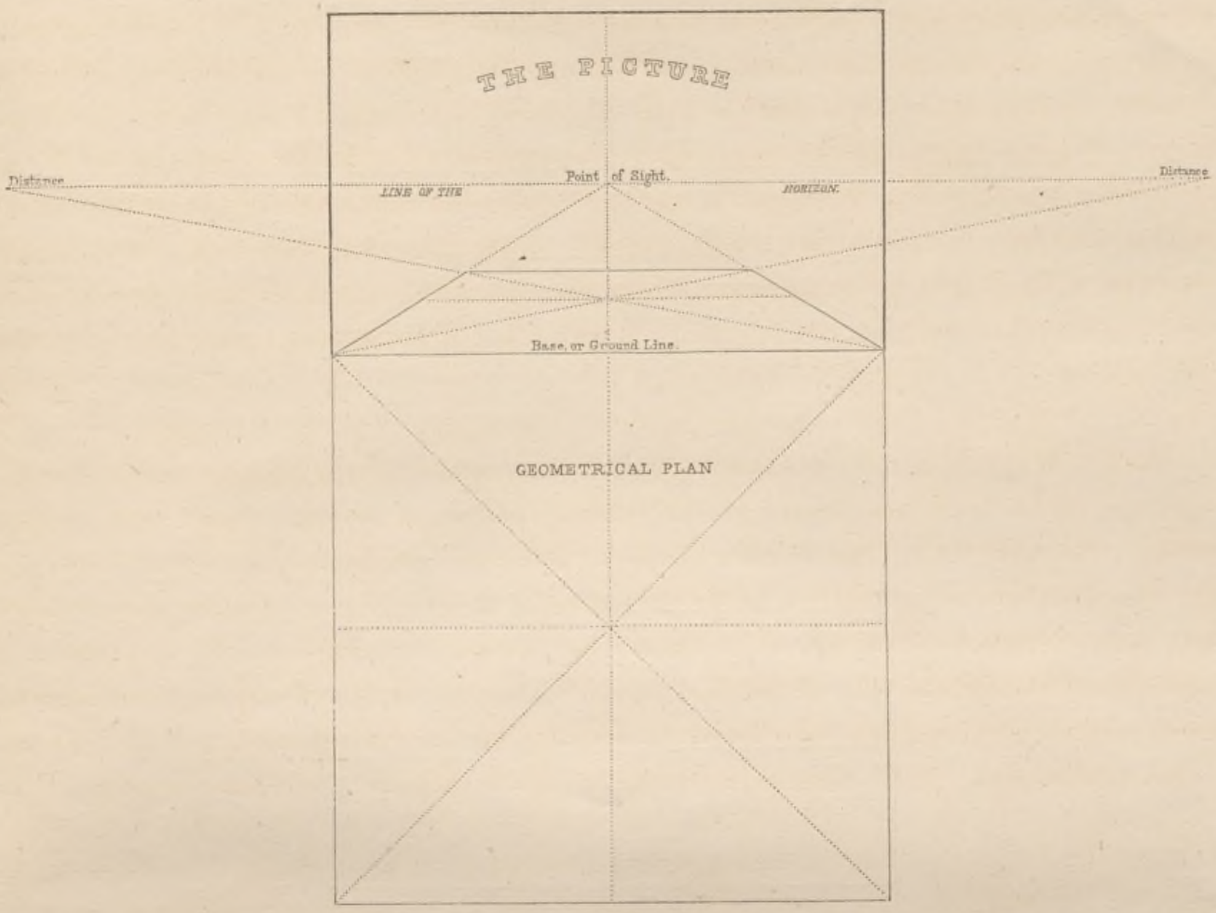
47. Let us suppose ourselves placed in a position to look directly up the centre of a long canal, and, for the sake of better exemplification, let us assume the circular, as the most natural form for our illustration (40). Our point of sight concentrates on that point which limits our utmost vision, and to it are directed all lines, in the scene before us, running parallel to an imaginary line drawn from our point of actual observation to the point of sight—such as those of the banks of the canal, the side of the house facing it, the wall on our left, etc.; while all level lines, which in nature are at right angles to this imaginary line, such as the weather-boarding of the gable end of the house, the roof of the shed, etc., necessarily are in the perspective picture parallel with the line of the horizon, and, if the frame of our picture were rectangular, would also be parallel to its base or ground line. We change our position, and stand immediately on the left bank of the canal, so as to bring its line as an actual perpendicular to the line of the horizon, preserving our extreme view up the canal as our *point of sight*, as at first. More of the front of the house now comes within the range of our vision, and the relative position of the various objects are perspectively changed, but not their proportions, as our distance is the same. As before, the same rules apply with reference to the lines terminating, or directed to the point of sight, and those running parallel with the line of the horizon, etc. Without moving our position, we *change our point of sight* from the extremity of the canal, by looking directly to the corner of the house, where now must concentrate our point of sight. This changes, of course, the imaginary and governing line from the eye to that point. We have not, now, perhaps, a single line in our picture which is either parallel, or at right angles to this imaginary line—not one, therefore, directing to, or concentrating in, the point of sight; and those that were before parallel with the horizon are so no longer—and, if not parallel to the line of the horizon, they must necessarily, if elongated or continued, come in contact

with it at some point, and at such point they must as necessarily meet, or form a vanishing point for all other lines that may, in nature, be parallel with them. Thus, as will be seen in the last example, the lines that before sought the point of sight as their vanishing point on the line of the horizon, do so no longer, but they must still concentrate, as before, at *some point* on the line of the horizon and harmonize together. While those that were before parallel to the line of the horizon, from their being in nature at right angles to the imaginary line from the eye of the observer to the point of sight, are so no longer, as this governing line has been changed; they therefore must be directed to and terminate in some point on the line of the horizon, harmonizing with their true position.

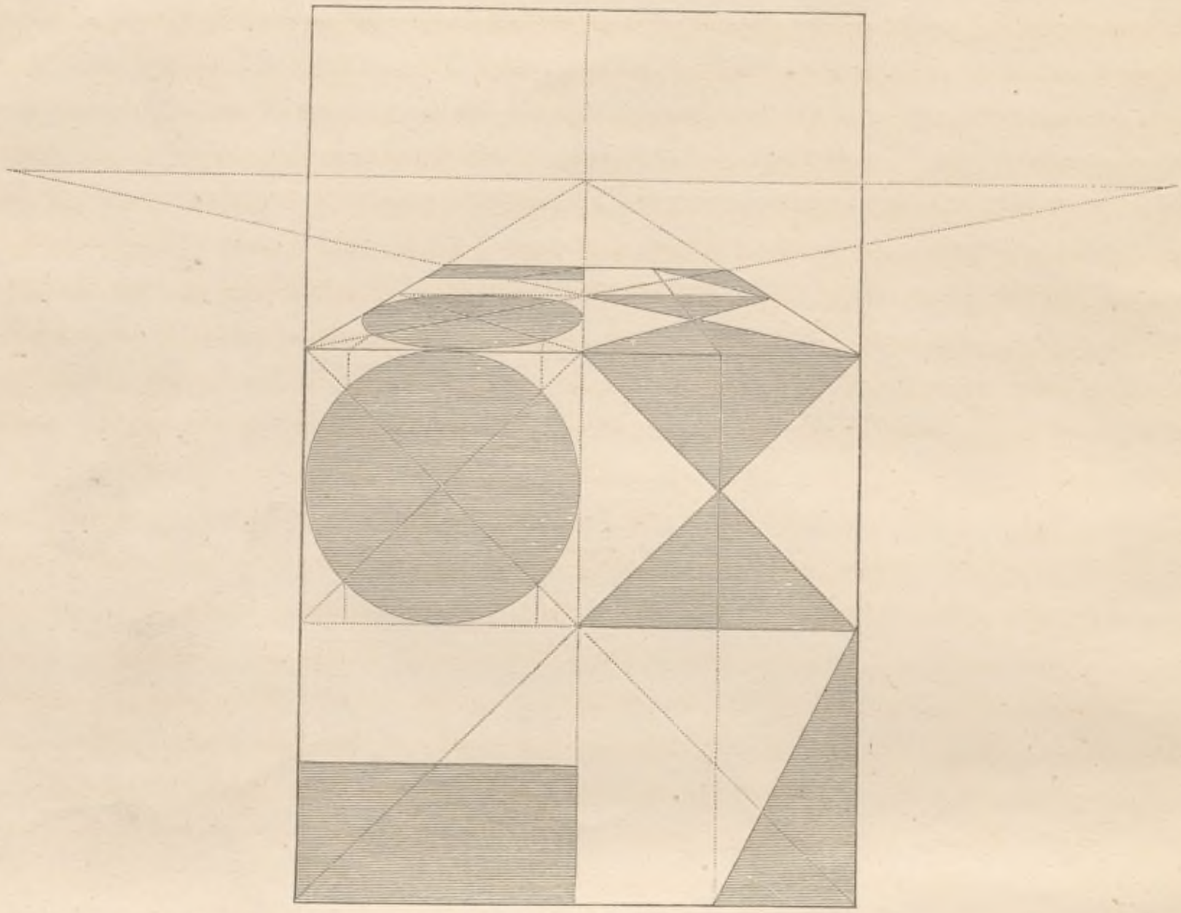
48. This brings us to a distinction recognised between *Parallel* and *Oblique Perspective*—a distinction which has nothing to do with the principles of the art beyond a classification of their results. The more the art, and its rules, can be simplified and generalized, the better. — As the eye recognises but one general rule in the diminution of objects, as they are more or less remote from it, so should it be in the art, which teaches the just linear representation of such effects in nature, and fortunately its rules of practical application are so simple and concise that the intelligence of their governing principles leaves no necessity for such classification, and consequently useless amplification. In the following examples are given instances of *oblique perspective.* As



it is evident, that, in one and the same picture, objects may be presented in every possible position, it is best to discard such classification in assuming a general principle for our operations, which will be found to serve in all the variety of position and circumstances under which nature may present itself, and art be required in pictorial representation. In the beginning we have endeavored to show a natural progress from points to lines, and from lines to forms, as the basis of design: thus we proceed in perspective. Having consumed as much space as our limits would allow in endeavoring to make plain to the student the first principles of the art, as developed in nature, and in showing their palpable evidences, therein so clearly and beautifully exemplified, let us now look to the means which it affords of their practical application to the purposes of design.



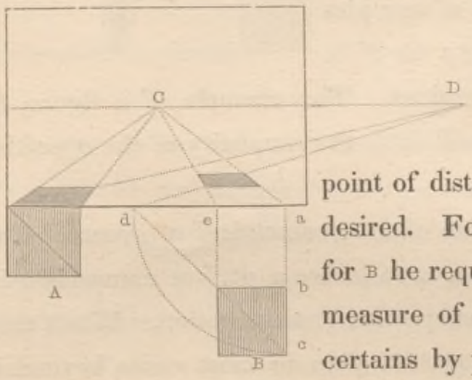
49. The square has been selected in our first lesson on the geometrical application of the art, as a form not only most intelligible, but at the same time valuable in consequence of the unerring verification of its diagonal with the *point of distance*, and for other considerations which will be made evident to the student as he progresses. Above we have the *geometrical* or *ground plan* of a square in connexion with its perspective representation or *perspective plan* in the picture, viewed under the governing circumstances of its *point of sight*, *line of the horizon*, *distance*, etc. It will be perceived at once that the square of the perspective picture in every way corresponds with that of the geometrical plan. Now, every one who essays to make a drawing or picture, can readily decide upon these points in advance—the *size of his picture*, the *line of the horizon*, and *point of sight*, and lastly the *distance* at which it is to be viewed, which distance it is necessary to have accurately defined, and here the *diagonal of the square* at once comes to his aid. Having drawn the lines of the two sides of the square, which vanish in the point of sight (as explained, 41)—one being already given in the base or ground line—the fourth alone remains to



be ascertained; in other words, having the lines of three sides of the square, he seeks by means of its diagonals to verify the position of the two points that remain to be established in harmony with the perspective circumstances of distance and elevation of the eye under which it is viewed. He therefore measures off on the line of the horizon, from the point of sight, the true distance, from which point a line drawn to the extreme points of the base line, representing the side of the square, lying, as it were, on the edge of the picture, and he has its diagonals, and consequently its fourth required side. And further, if he is able to produce the square of the geometrical plan thus accurately placed in perspective, he has the basis therein of any other form or figure, as above shown, observing, however, that there is a necessary reversion of the geometrical plan in its perspective reproduction. Before going further, it is desirable that the student should exercise himself in this simple and easy application of the geometrical plan of a square to the perspective picture; in doing which,the larger he makes his drawings the better, as error is thus more evident and accuracy more certainly attained—extending the points of distance, elevating and depressing the line of the

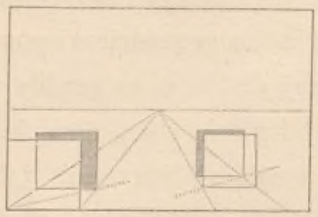
horizon, etc., closely observing and making himself familiar with the existing harmony between the geometrical and perspective square in all its details. Thus, having ascertained the four cardinal points, angles, or corners of the square in perspective, he finds, as in the geometrical square, the diagonals at their intersection give its centre; this found, he may divide it as readily as the real square into four equal rectangular divisions — again, into triangles, etc.; and thus, on the basis of such like divisions, points, and angles, he has the means of ascertaining the truthful representation of any form or object he may desire. It will be as easy for him in the end to draw a perspective as a geometrical plan, and with equal accuracy. After a perfect comprehension of the principles involved in the process, it will be no longer necessary for him, in all cases, to draw the entire ground plan of his perspective picture in his practical operations.

50. Suppose, for example, he desires to place two squares in perspective — the one (A) lying on the edge of his picture, and parallel to it — the other (B) at a distance from the base line, equal to a b, and also parallel to it. The assumed point of sight (C) secures the direction of two of the sides of each square, and the point of distance (B) giving the diagonals, leaves nothing more to be desired. For the square A he has to proceed as before shown; but for B he requires a diagonal equal to that of a square of which the measure of one of its sides should be equal to a c: this he readily ascertains by placing his compasses on the point a, and either striking an arc to its intersection with the base line, or simply making a d on the base line equal to a c — thus having (in a d — a c) two sides of a square of which d c would be the diagonal, a line drawn from D, the point of distance, gives this diagonal in perspective, and by its intersection with the lines c e — c a, the points which verify and represent the perspective view of the square B under all the circumstances it was desired to place it in the picture.

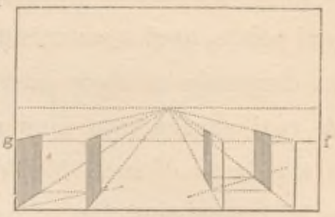


51. Having by this process ascertained the true perspective view of the two squares, always supposing them lying in a horizontal or level position — which for the sake of exemplification we may suppose to represent the bottom of a box, which, if its sides were all put together, would make a cube — it is evident that if two sides were added, corresponding in size to the squares already drawn, which may be said to represent the bottom of such a box, or base of a cube, and fitted thereto as shown on the following page — first on the sides lying parallel to the base line

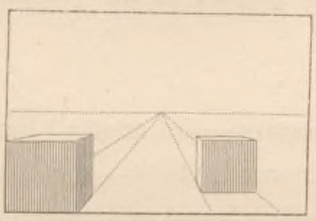
of the picture, and next against those at right angles to it—they would perspectively appear as



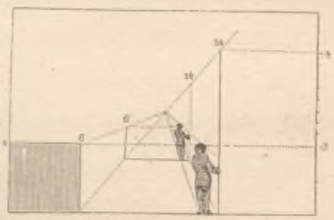
figured, the true measures assumed upon the base line of the picture, as indicated by the line g f, for the perpendicular sides and which may be made to serve as well for those lying horizontal, by their simple adaptation thereto.



52. Let us presume this cube, or square box, to be exactly six feet high: it gives us, as it



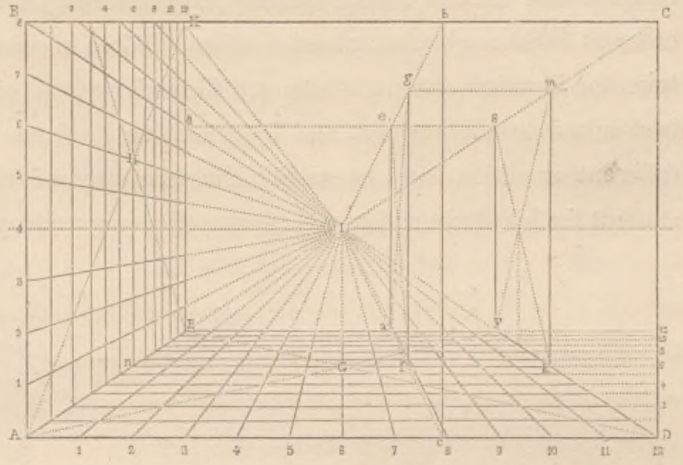
were, a scale, by the aid of which, and by an analogous operation, we can, upon the same principles, place any other object or figure, of any given height or size, on the perspective plan of our picture, with as much certainty as if it



rested on the base line and represented its exact dimensions. The example of a figure, the height of the box, holding a pole, say fourteen feet high, will show the simplicity of the operation.

53. Once more it may be desirable to refer to the value of the *geometrical* or *ground plan*, not so much for the necessity of its use in general practice, as to insure a perfect comprehension of the principles of its connexion and harmony with its perspective representation. When these are properly understood, there exists no necessity for a ground plan in most cases, beyond its distinct impression on the mind. In the example on the next page, to which we now refer, assuming our picture (A B C D) to be of the proportion of *twelve* by *eight* parts, according to the scale which we intend our design to be, in reference to the true and natural size of the objects, we may call these parts the representations of feet. Having the size of our intended picture secured, we have next to decide upon the line of the horizon, points of sight and distance, and by the aid of these to produce a perspective square (A E F D) by the easy process already shown (49). A D representing one side of this square on the scale which the picture is assumed to be in reference to the natural size of the objects it is to represent, we next proceed to measure off on this line twelve parts; and first having drawn lines from each of these points of measurement to the point of sight (I), we next by the aid of the diagonals (D E—A F) get by their intersection with these lines the points which secure us the further division, with as perfect perspective certainty, of the sides D F—A E into twelve equal parts, as we have on A D and E F; and our

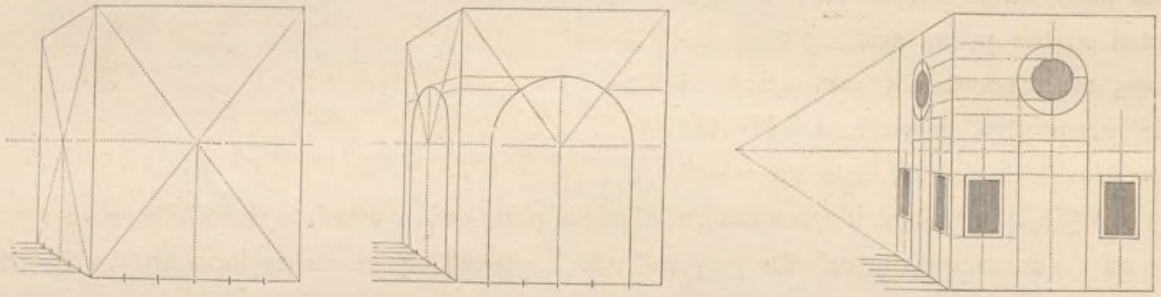
perspective plan as accurately divided into *one hundred and forty-four* squares, each perspectively representing a square foot, as we could have it thus divided and proportioned in a *geometrical plan.* The lines A E—D F, therefore, being in every respect perspectively equivalent to A D and E F, as well in their twelve equal divisions as in their whole length, vertical lines erected on the points marking these divisions, must necessarily correspond in their perspective proportions with the scale of the horizontal line on which they rest (**51, 52**). Thus, if we measure off eight parts on A B equal to the divisions on A D, we have on A B as accurate a scale for perpendicular lines and objects as we have on A D for those lying level or horizontal.



54. Let us suppose we desired to erect a perpendicular line on the line E F at the point a—which shall be eight parts (or feet) high. This we may do at once by drawing a line from the point of sight through the point a, and extending it to the base line (as I a c); on the point c erect a perpendicular (as c b), and on this perpendicular measure off eight parts, which in this instance the height of the picture gives us; then draw a line from b to the point of sight, and its intersection with a perpendicular drawn from a will give the line a e required. If this perpendicular falls, or be erected, on any point along the line E F, its length and proportions must be the same, and correspond to the proportions of E F in every respect. Should we desire to place this perpendicular on any part of the square (as f g), the process is precisely the same, as well as its verification; or a still shorter way may be adopted, based upon this process, by measuring the height of the perpendicular by the parts of the horizontal line on which it rests. Thus it will be found that f g is equal to eight parts taken on the line n f k, on which it rests; and a e is equal to eight parts of the line E a F, as the lines A B—c b—D C are severally equal to eight parts of A D or B C.

55. It must be remembered that, in the division and subdivision of all perspective forms or figures, they should be treated precisely as though they were drawn on a geometrical or ground plan. As A E F D truly represents an actual square, so do all its parts and proportions. All the

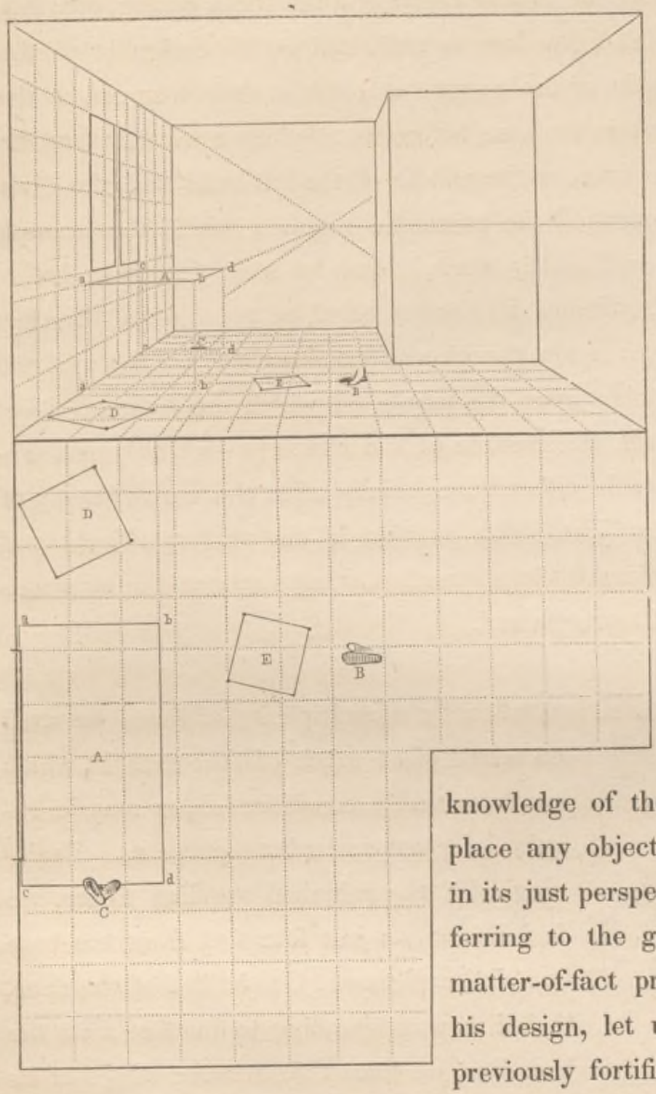
angles of its one hundred and forty-four divisions represent right angles, and all their sides are equal to one another: consequently, all their diagonals must be considered as intersecting each other at right angles, etc.; and, further, all less regular forms are thus equally effected. Let us take, for instance, the parallelogram formed by f k m g in the example we have just considered, as best suited to our purpose, and by repeating its front and side view, as perspectively seen under different modifications, exemplify the harmony of this operation, which is placed before the student for his study and practical exercise, preparatory to that which we have now to consider.



56. It may have appeared that the way of the beginning in the study of the art of perspective has been long, and as yet no practical results have been attained. We gladly, therefore, hasten to convince the student, who has carefully pursued the course thus far laid down, that he has secured, in the possession of a comprehension of its elementary and leading principles, a solid basis that leaves but little more than his own intelligence, practical observation, and application, to complete the work. The guide may now safely assume the part of companionship, and both may now reason together more understandingly. Having in view the design presented,

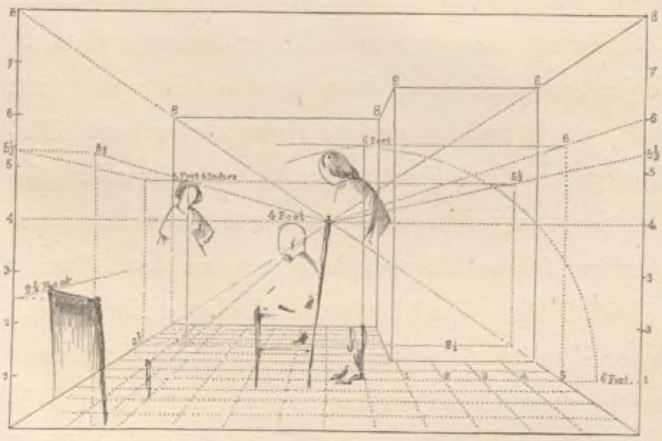
in connexion with the exemplifications which follow on the next page, it will be easy to show that every principle and rule of perspective involved in its production have already been explained and placed within the means of practical application. In reviewing the ground which we have passed over, we make ourselves more secure of its possession, and may recover something lost sight of or perchance neglected, the want of which we may sensibly require hereafter. Let us therefore do it carefully, for the profit will well repay the pains.

57. We have here the general perspective outline of an apartment corresponding with its geometrical or ground plan annexed, which has been produced precisely as that already presented and explained (**53, 54, 55**). We therefore know that its walls represent the height of eight feet; that its floor is twelve feet in depth, from the base line of the picture to its extremity; that it is of the same width until it reaches the distance of six feet, at which it becomes narrower by a little over four feet, which are taken from it by the projection of the doorway or entry. Every foot of its floor, which, for the sake of making the end to which we aim more clear, we may consider as tesselated in squares of a foot each. Every foot of this floor is therefore laid off as accurately in the perspective as in the geometrical plan—and thus, if desired, every inch of it might be as positively defined; and not only on the floor, but on the walls, ceiling, etc., in like manner. It would argue little for our progress, even thus far, in the acquirement of knowledge of the art, were we not able, upon such data, to place any object, we desired to introduce in this apartment, in its just perspective position and its right proportions. Referring to the geometrical plan rather to bear in mind the matter-of-fact premises assumed by the artist in making out his design, let us follow his practical movements. Having previously fortified himself with a general idea or impression of his subject, and perhaps with a memorandum or sketch before him, he has arranged the dimensions and general outline of the apartment, and marked off the various measurements and divisions which he will most likely have occasion to require. This he can do in chalk, charcoal, soft lead pencil, or some such substance, whose marks may be easily erased after their service has secured the end desired. As yet he has nothing but the tesselated floor and blank walls defined. The floor in its squares gives him as certain and well-defined a basis upon which to place the



figures and objects he may desire to introduce in his picture, as to place the men upon a chess-board. Whether the floor is tesselated or not, the same expedient equally serves; for after having fulfilled the service of their intention, all vestiges of these lines may be easily erased. In like manner as the floor, every portion of the interior of the apartment, the walls, ceiling, etc., may be thus laid off, if required—leaving the artist a freedom as unlimited as his design in placing the principal and accessory objects and details of the picture at once in their true perspective position. If, for instance, he should desire, as in the case before us, to place a window four feet square, whose sill shall be three feet from the floor, in the middle of the left-hand wall, the divisions already described thereon give him at once all the points he requires, which the example we have just had under consideration will sufficiently show, aided by what has been before explained (55). Immediately in front of this window he desires to place a table (A) five feet long and two feet eight inches broad and high: again the dimensions described on the wall and floor come as efficiently to his aid. To decide upon the points on which the figures (B—C) stand, will be found equally as easy; and even the position of the chairs (D—E), although presented obliquely, will occasion no insurmountable difficulty, especially after the careful study of that which will presently be offered on the subject. The position of the various objects and figures of the picture being thus accurately defined, their perpendicular measurements in reference to such perspective position alone remains to be ascertained.

58. To prevent entanglement of thought and operation by a multiplicity of lines, we avail ourselves of so much of the example, which we have under consideration, as may be required for our immediate purposes. Beginning with the principal standing figure, we find he stands just four feet from the base line of the picture. On the line of the floor, therefore, corresponding to four feet from the base line, we take the measure of six of its parts, representing feet, being the ordinary standard of a man's height, and making some little allowance for his stooping attitude, the perpendicular line drawn from his left heel, being equal to the six parts taken from the horizontal line on which he stands, gives us all that we require. This is perhaps the easiest and shortest method. In the instance of the figure of the girl standing behind the table, a similar course might



be pursued; but let us select another, as well to show the agreement in the results of the art, as further to discover to the student its resources. Having decided upon the position on the floor, or pavement, on which the figure may be supposed to stand, we connect it by a right line, from the point of sight, extending to the base line of the picture, on which, from the point of such connexion, we erect a perpendicular, which, by the original scale of proportions laid off, or assumed, upon the base line, we make equal to the real height of the figure (say five and a third parts, representing five feet, four inches), as if it stood upon that line. A line drawn from the height of this perpendicular of the base line to the point of sight, must necessarily give, by its meeting a perpendicular erected from the position on the floor, or perspective plane or plan, the just perspective height or measure of that figure in reference to its distance from the base line (51, etc.). Thus, by either this or other methods, based upon the elementary laws of the art, may we proceed throughout our picture; beginning with certainty, no matter where, and keeping all in harmony with that beginning throughout our progress; adapting the graphic representation to the instinctive impulses and requirements of that delicate sense by which the impressions of art are conveyed to the mind, so that in its perfect accordance with the habits of observation with which the eye most agreeably receives the impressions of nature, it meets an equal reception, acknowledged and unquestioned, as the reality. The sympathetic language of the thought makes it welcome and intelligible. Art accomplishes its ends, and acceptation rewards the artist.

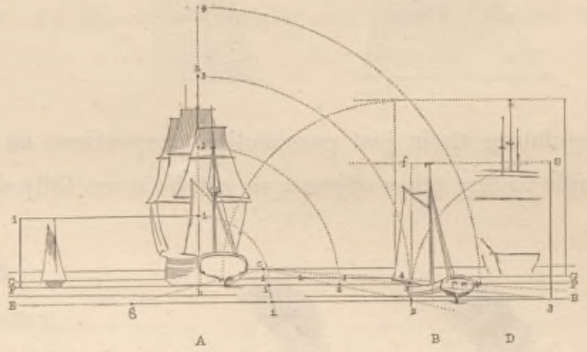
61. To some, even these operations, simple as they are, may prove embarrassing, and an inverse method more desirable, by first adapting the perspective operation to the principal figure, group, or motive of the picture, and thence proceeding to its details and accessories. This, it must be admitted, is the more artist-like, the other the more mechanical method of procedure. In both, however, will be found the utmost harmony of results, and in the principles of the art involved in their attainment, which, when once perfectly understood, the artist may set to work with more latitude in his methods of reaching his object of just representation. Instead of beginning with the perspective of the apartment, and other details, which perhaps it may be desirable to make subservient to the leading group or subject, to insure certain effects of light, shadow, color, or composition, and which it may be better to leave as an after-consideration—the artist makes his beginning with the principal group, by first deciding as to the space it shall fill on the field of the picture, leaving as yet unsettled the distance, horizon line, etc. Having sketched in the general idea of this commencement, he assumes its proportions to represent the standard or scale of all other details or objects he may desire to introduce in his composition: and drawing a

horizontal line through the point on which his leading figure stands, he takes the height of that figure (say six parts, or six feet), which, reduced to a scale on that line, gives all that he requires as a basis for after-operations. He must now decide upon the point of sight, which necessarily gives with it the line of the horizon, then the distance of the picture, etc. If he desires to tesselate the floor, for instance, lines drawn from the point of sight through the divisions on this horizontal line will repeat the scale as justly on the ground line and throughout the whole perspective plan of the picture as if he had begun as first suggested; the horizontal line first assumed, serving the practical purposes of a base line and with equal efficiency.

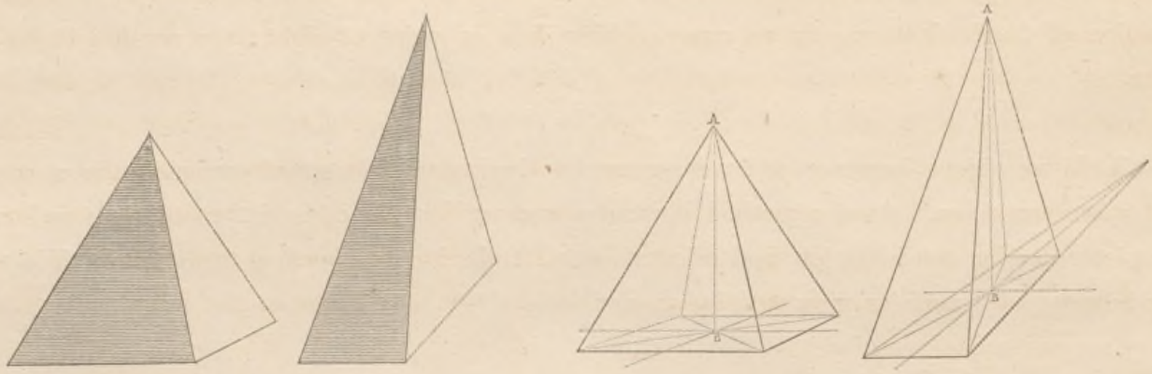
62. Again, as in the case of a view that it would be almost impracticable, if it were even necessary, to reduce to a measured perspective plan, we may select any one object which may be considered as a definite standard, and on such premises reduce all other objects and details into perfect perspective harmony, by means most simple and easy. In the case before us, it would be as difficult as unnecessary to draw a geometrical plan. It is easier to tesselate a pavement and define every inch of it than to tesselate the traceless ocean, and yet do objects floating on its calm or disturbed surface come as equally within the government of the laws of perspective. Here we have all our lines of operation and verification to assume, except our line of the horizon and point of sight. Whichever object we select as our standard, if it be the sloop (B) nearest to us, for instance, we take its full height by a perpendicular from its vane to a central point between the water lines which mark its floating position on the perspective plane of the picture (64), and connect the extreme points of this perpendicular with the point of sight. We next decide upon the position of the ship (A) by the line F F. Supposing the ship (A) to be *three* times the height of the sloop (B), a perpendicular elevated anywhere on the line F F three times the height that the sloop would be if she were perspectively on that line (F F), will give the true height of the ship as exemplified; for it is evident that if the sloop were at the same distance as the ship (A), that is, on the line F F, her height would appear as indicated — a b — etc. Again, still more remote from us, let us suppose another ship (D) *four* times the height of the sloop, the horizontal line G G expressing that distance. By a like process do we attain the height of the ship D under such circumstances; while another ship (H), still more remote, supposed to be of the same height as A, may be thus equally, and by a similar method, brought into true

perspective proportion. It matters not which object we begin with, or upon what point on the line of the horizon we fix as our vanishing line or point of sight: the result will be the same.

63. If we choose, however, to have recourse to horizontal instead of perpendicular measurements, we can do so. As one method illustrates and verifies the other, let us take an outline of the picture under consideration, and select as our standard of proportion the ship A. We take her height (a b), and (as indicated by an arc or by measurement) transfer it to the horizontal line F F; then from the point of sight, or vanishing point (c), we draw a line passing through the extreme as well as the dividing points of this horizontal measure. Now, it is plain that if the numerical points 1 2 3, measured from b, on the line F F, are equal to the corresponding points on the perpendicular lines a b, drawn through them and extended to the line E E will give 1 2 3 on E E perspectively equivalent to those on F F—which, being equal to the like divisions on a b (the height of the ship A), and the measure of one of these divisions, as e f taken on the line E E, must necessarily give the true height of the sloop floating on the line E E. And, further, if the ship A were on the line E E instead of F F, her height would be equal to the measure between g and 3 on that line. In like manner we may proceed with B, and so on throughout the picture; keeping always in mind the principles of the art, and working in harmony with them, our methods of operation can not lead to error.

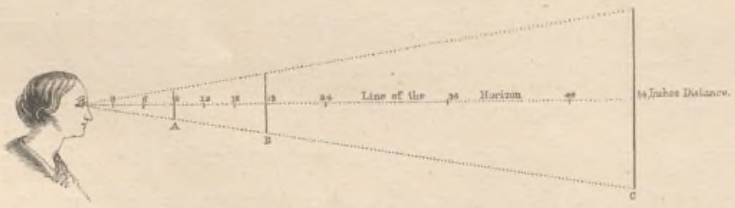


64. It should be remembered that in ascertaining the height of an object in perspective, we must do so by means of a perpendicular drawn or imagined to fall from the highest point of such object to the perspective plane. Thus, as in the following examples, the perspective height of the pyramidal figures is not to be measured on their outline, but by a perpendicular (A B) falling from their highest (A) to the central point (B) of their base. In like manner, we are not to measure the height of the vessels, in the examples we have just had under consideration, from the top of their masts to the water-line nearest to us, but to a central line and point between the water-lines on either side of their hulls—presuming the vessels to be becalmed, sitting perfectly even on the water, and their masts to be perpendicular. If otherwise, either by the action of the wind or other causes, we must still have recourse to a perpendicular as the basis of

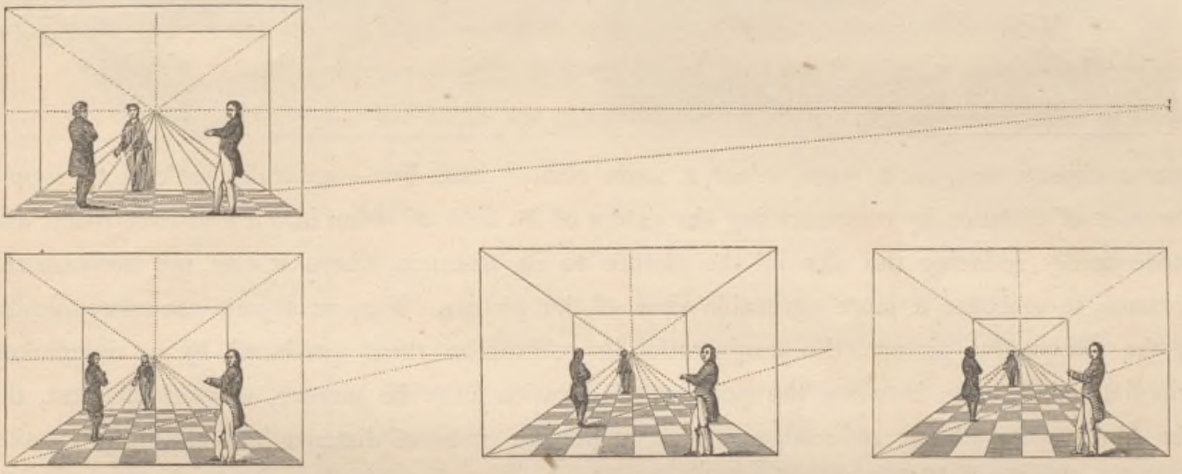


regulating their just perspective proportions as to height; and the same observations are applicable to any other objects, as will be more fully shown hereafter.

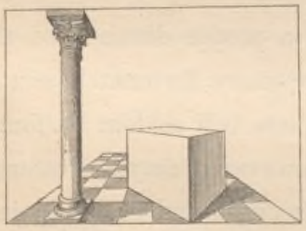
65. The judicious selection of a POINT OF DISTANCE for a picture should be one of the first considerations with an artist, and here again he has but to apply to art the practical teachings of nature. The size, the subject, the situation it is destined to occupy, the circumstances under which it is to be viewed, all require to be thought of in deciding upon the point of distance of a picture. It will be found that the delicately-constructed organ of sight instinctively refuses to receive more than a certain field of vision; and that as this field is increased, it seeks relief by increase of view. Thus, if we have a little picture of three inches in size, a point to view it less than nine inches distant from it is painful to the eye. A more distant point may be agreeable, but rarely one nearer, except with persons of defective vision — and even then the eye wanders over, rather than embraces the whole. If it be nine inches in size, eighteen inches may be fairly regarded as the most pleasing point of distance; thus, also, if of eighteen inches in size, at least fifty-four inches of distance should be allowed. Increase these sizes for the picture to feet, and like will be the result. Hence we may set it down as a general rule, to be consistent with the instinctive laws of vision, that the *distance of a picture should be at least equal to three times its size.*

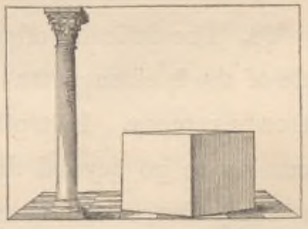


66. It is from neglect or disregard of this rule that pictures often offend by the violence of their perspective. The eye instinctively rejects such impressions when they do not harmonize with its accustomed habits of observation of nature: everything seems disordered and disorganized, as they really are; it forms no just ideas of the relative positions and proportions of the scene or objects represented; and falling back upon its own impulsive conclusions, subjects art to a severer ordeal and a truer one than the most learned jury of the schools, who are too often blinded by the letter of the law, and forgetful of that simplicity of truth which is its soul, as it should be its substance, purpose, and end. In the first example, we have an outline of



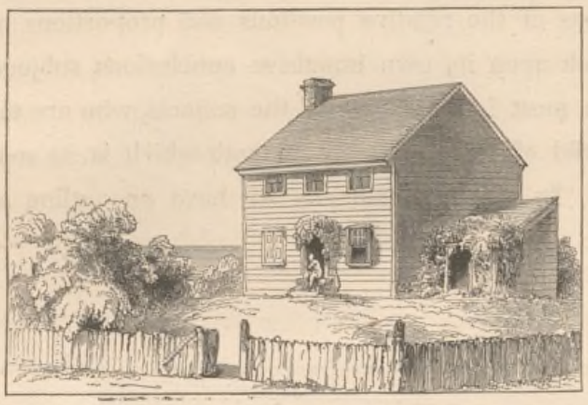
an apartment equal in depth and width, with three figures viewed at the distance of three times the width of the picture; in the second and third of the same apartment, with like figures, this distance is reduced with evident progress to disproportion, and in the fourth the error becomes still more palpable—which a solitary column and a square block or cube presented on the two extremes of these examples will render still more apparent. The least practised eye will be struck by the comparison.

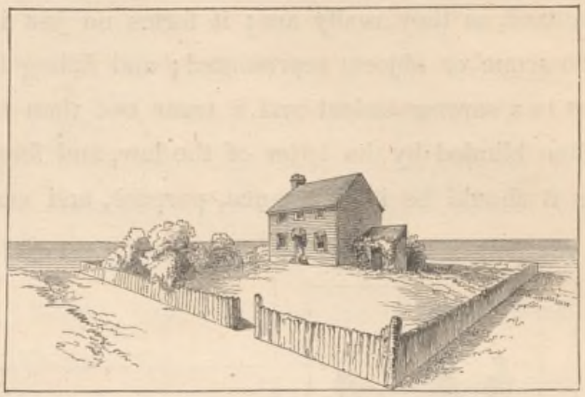




67. To carry out our illustration of violation of a proper selection of the distance of a picture, we have at the head of the next page the same view taken at two distances—the one equal to three times the width of the picture, the other at but one half its breadth, thereby reducing it, especially in the foreground, into positive distortion. In other words, with a point

of distance assumed so near that the eye recognises neither unity nor harmony in its proportions. If the eye were placed so near to the first object in the picture (the corner post of the fence) as the distance of the second example indicates, it would naturally discard from its picture the



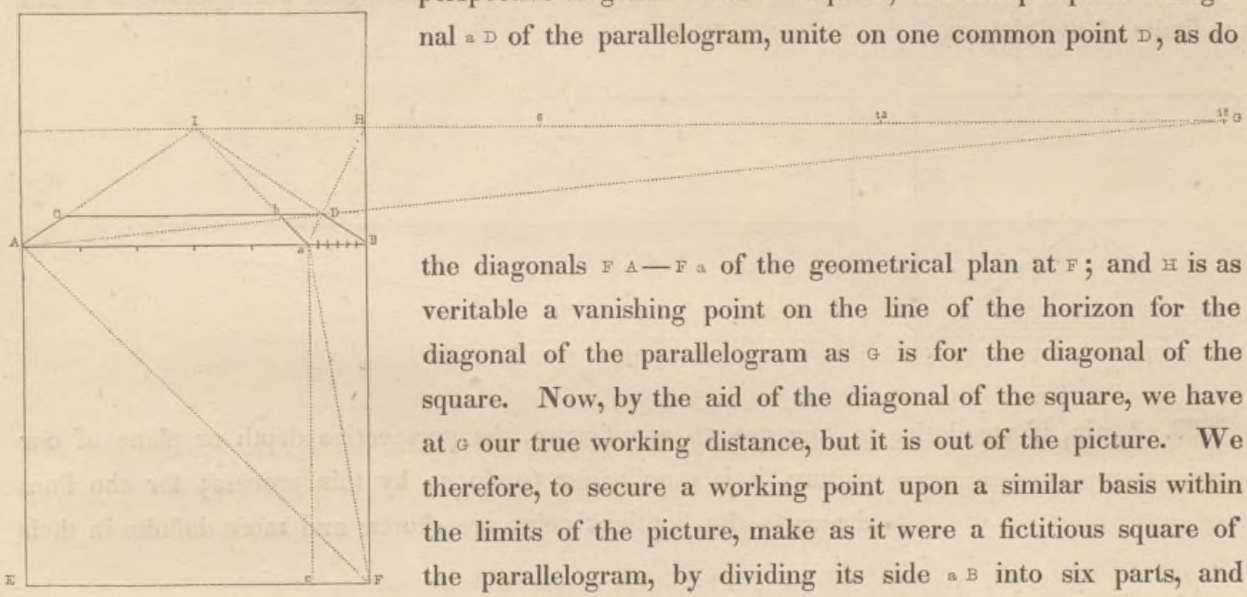


nearer objects, and, as it were, select a more remote base line—naturally seeking to supply the want of distance by concentrating the extent of its field of vision into a narrower space, and consequently reducing the size of the picture to its distance, where it can not increase the distance, to embrace a more agreeable view of the picture. For, as objects are more remote in the perspective picture, the exaggeration in relation to them, produced by an injudicious selection of distance between the point of observation and the picture, is gradually lost, the size of the picture being reduced, and consequently the point of distance increased in proportion to such reduction. Take as much of the view in the second as we have in the first example for our picture, discarding the nearer objects, and we have thus a nearer approach to a proper and well-proportioned distance by such reduction of its size.

68. The difficulty often felt by artists for want of space to extend a proper distance on the line of the horizon as far out of the frame of the picture as may be necessary, fortunately admits of easy remedy. In truth, for most purposes of practical operation, there will seldom be found occasion to go beyond the limits of the drawing-board or canvass, however it may be better in the study thereof for the clearer elucidation of its principles. As well secured and certain points upon our perspective plan, which are governed by the point of distance, in connexion with the diagonal of the square, form the basis of most perspective operations, the following method of fixing a fictitious point of any required distance within the frame of the picture can not fail, from its value, of eliciting the serious consideration of the student, and induce his earnest study and attention. Let us suppose our intended picture to be of the width of six parts (which we may call inches, feet, etc.), and we require therefor a working point within its frame that shall

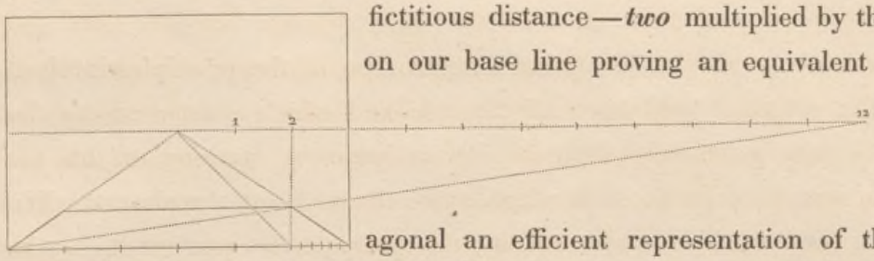
be equivalent to a point of distance of three times its width—that is, eighteen parts measured on the line of the horizon from the point of sight.

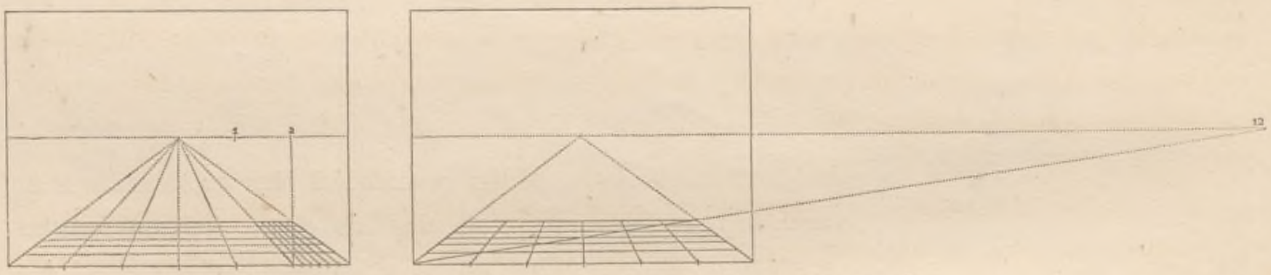
Without entering upon a more minute mathematical investigation of the principles involved than may be necessary for the practical application of the rule, and which a reference to the geometrical and perspective square sufficiently illustrate, let us begin by marking off on the base line six equal divisions, to represent the six parts which make the width of the picture. We have the geometrical square A B F E truly represented by the perspective square A C D B; its diagonal A D verifying the distance (I G) of eighteen parts; and the geometrical parallelogram a B F c perspectively produced in a B D b. It is plain that the line C D gives a perspective depth equal to any side of the geometrical square: it therefore represents the depth of six parts. The perspective diagonal A D of the square, and the perspective diagonal a D of the parallelogram, unite on one common point D, as do



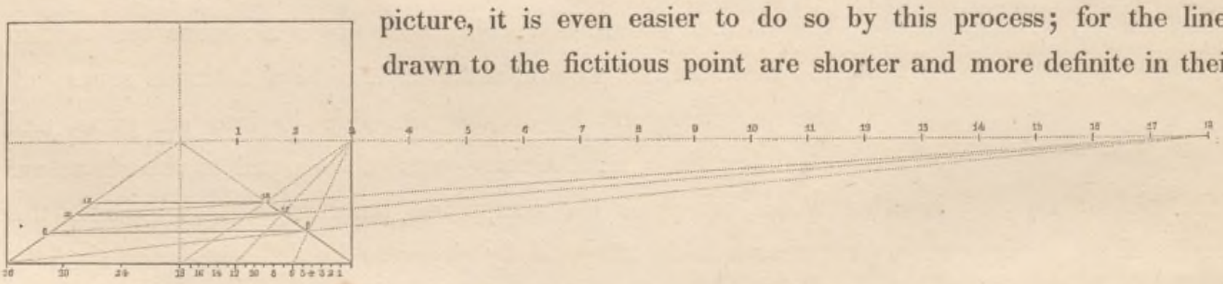
the diagonals F A—F a of the geometrical plan at F; and H is as veritable a vanishing point on the line of the horizon for the diagonal of the parallelogram as G is for the diagonal of the square. Now, by the aid of the diagonal of the square, we have at G our true working distance, but it is out of the picture. We therefore, to secure a working point upon a similar basis within the limits of the picture, make as it were a fictitious square of the parallelogram, by dividing its side a B into six parts, and assuming these six fictitious parts of a B equal to the six actual parts laid off on A B; in other words, we press the perspective parallelogram a B D b into the service of a square (A C D B), together with its diagonal, by giving to its defective sides six fictitious parts to stand for the six real parts of the square. The sides B D—a b being real, and terminating in the point of sight, are not affected by our assumption, but the diagonal a D is, as it thereby represents the diagonal of six such parallelograms united; and of course, instead of a distance of three parts at *the point* H, it gives six times that, and all that we require as a fictitious point of distance, fully equivalent, for all practical purposes, to the real point of distance G, and yet within the frame of the picture. Let us, as in the next example, for the sake of clearer illustration, reduce our distance to *twelve parts*. The result will be precisely the

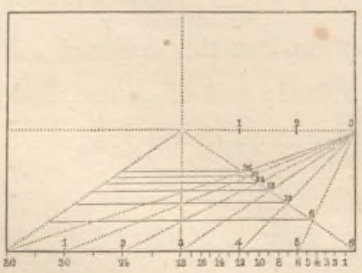
same. In this case we take *two* parts measured on the line of the horizon, and make that our fictitious distance—*two* multiplied by the number of fictitious parts on our base line proving an equivalent to *twelve* real parts, or the true distance. And thus we have in the perspective of the parallelogram and its diagonal an efficient representation of the square, not only in the verification of our point of distance, but, working from a fictitious point of distance, to which it either directs or from which it originates, we are enabled to produce not only the perspective of a square, but all its parts and divisions, as perfectly as if we had the real point of distance measured on the line of the horizon—and with the advantage of having all our operations within the limits of the picture.

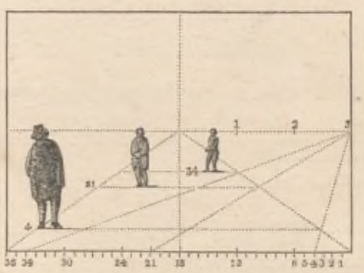


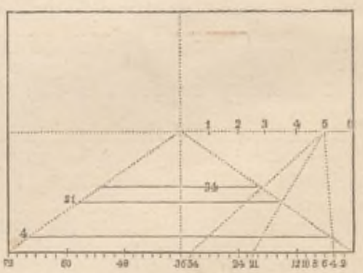


69. Again, if we desire to increase, to any degree, the perspective depth or plane of our picture, it is even easier to do so by this process; for the lines drawn to the fictitious point are shorter and more definite in their



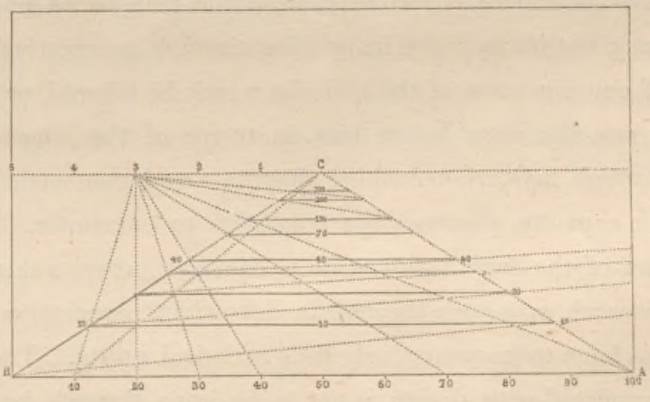






intersection with those terminating in the point of sight or vanishing point, than those seeking a more lengthened termination in the real point of distance. It is evident, however, that as a distance equal to three times the width of the picture brings the fictitious point at 3 on its very edge, a greater distance—say five times the width thereof, or of thirty instead of eighteen parts—must necessarily carry such point beyond the field of the picture. To obviate this, and still secure a working point for our distance within the limits of the picture, we have but to double the scale on the line of the horizon, and also the fictitious scale on the base line to harmonize therewith, as shown in the concluding example on the last page, by which the point 5 gives as certain a point of operation in connexion with the doubled proportions on the base line. A distance of five times the width of the picture, however excessive it may appear, may in many cases be required, wherein this method will be found of great value. Suppose a picture twelve feet wide, destined to occupy a position which rendered it essential that its perspective should be calculated for a distance of sixty feet: few apartments could be found of sufficient extent for operation by a veritable point of such distance; and even in smaller works of the drawing-board or easel, the application of this method will be found to obviate a difficulty constantly encountered by the artist and draughtsman.

70. Further to illustrate the operation of adjustment of extreme distances of objects on the perspective plan: let us take *ten* parts for the width of our picture, which are justly expressed by the numerical points on the line of the horizon, and giving to those on the base line a fictitious proportion of ten to each real measure; thus, we have ***one hundred*** fictitious parts laid off on the base line, by points of *ten* each. Assuming our point of distance to be three times the width of the picture, that is, thirty parts, the numerical point 3 on the line of the horizon gives us a fictitious point of distance corresponding to the fictitious points on our base line. Thus we have the means of accurately defining on our perspective plan the length of the line A B at any distance in the picture we require. In the example before us, the verification of the first four lines at the distances of 10, 20, 30, and 40 parts, is proved by the diagonals running out of the picture to the right, which, if space would allow for their extension to an intersection of a continuation of the line of the horizon, would be found



to terminate and unite in the real point of distance, as those on the left terminate and unite in the fictitious point of distance 3 on the line of the horizon. Without requiring another example, suppose we had, say, an extensive view, and we desired to ascertain the perspective proportions of objects extremely remote; and further, that instead of allowing ten real parts (call them feet if you will) for the space embraced by the foreground or base line, we make it *one hundred*—thus by multiplying all our numerical points, real and fictitious, by ten, we have all that we desire. If we have an accurately laid down horizontal line, to get the perpendicular height of objects, no matter what they may be, at the distance of this line, is an operation already too familiar to need repetition.

71. It will be found that in many of the examples given we have been forced to the use of a shorter distance of view than has been recommended. This the limits of our page have in a great measure compelled, in the first place; and in the next, by exaggerating or making the perspective more violent than would be proper in a picture, the principles it was desired to illustrate may have been made more evident.

It is earnestly desired to impress upon the mind of the student the importance of resting satisfied with nothing short of a thorough comprehension of all as it is placed before him, testing and verifying each and every operation for himself. If less has been said and exemplified on the subject of the elementary principles of the art, with a more strictly mathematical analysis of these principles, it has been from the fear, based upon experience, that the learner might either wear out his patience in groping through geometrical labyrinths to little useful purpose, for want of consciousness of the ends for which he labored, or else break down in the very outset, as many a one has done before him, in terror of the long and cheerless way that presented itself—through mysterious-looking diagrams and geometrical problems, which not every head, if it has the capacity, possesses the resolution to encounter. Indeed, it may be fairly doubted if ever yet one of the huge volumes of perspective complexities, although full of geometrical learning and research, was gone through in downright earnestness by the student; and if it may have been, it has been to comparatively little practical utility. The study of perspective, like that of all others connected with design, is not to be gone through by the book alone, page by page, to its accomplishment; but its knowledge must be attained by an eye rendered susceptible to the evidences of the truth of its principles, as they are developed in nature, and a mind gradually strengthened to their investigation and application in design, to which it holds the place of an accessory, not that of a primary motive. It comes to the aid of the artist in the development and expression of his art, as do many other branches of knowledge—any one, or all of which, acquired to the

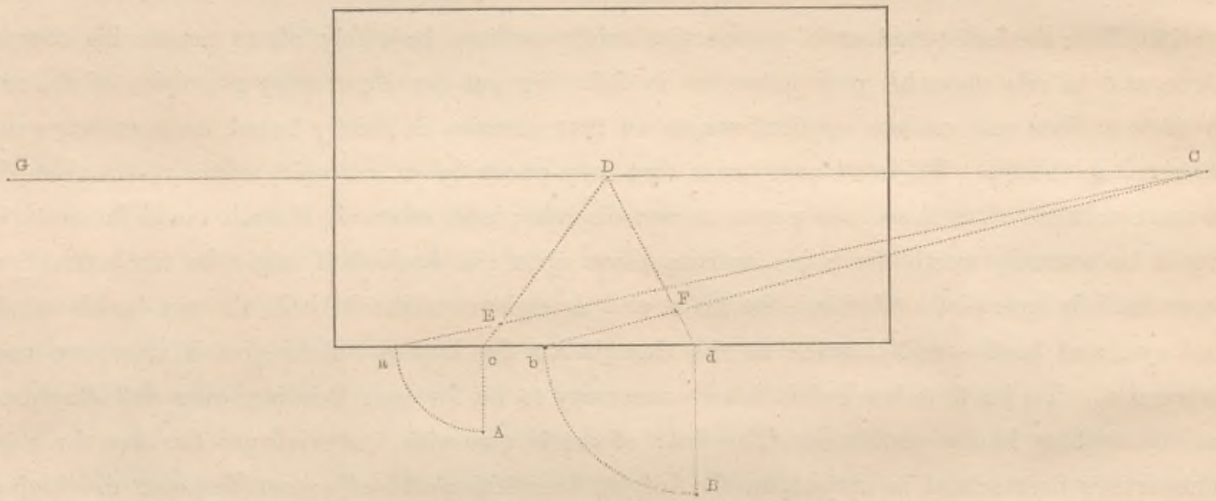
utmost extent of learning, would tend but little to constitute an artist, independent of the primary and mere leading qualifications requisite for the imitative and inventive art;—as the poetry of thought precedes the measured line and its rules of harmonious expression, and as no rules of prosody can make a poet or gift the mind with power of expansion to the bright and privileged world of fancy, yet is their assistance indispensable to reduce to order the pictures of its gathering or creation.

72. Here the artist-student of perspective might perhaps be safely left to pursue his course alone, and to rely upon his own judgment in following out the elementary principles of the art in their various and endless applications, as all that remains is chiefly based upon merely geometrical operations. To meet every case that may occur by an example, would swell our work to more volumes than there are pages at our disposal; and, after all, if such could be done, it would be scarcely worth the pains, and its place upon the book-shelf might be far better and more usefully occupied. Besides, the artist and draughtsman should hold the art in his mind, and eye, and hand—ready, quick as the thought or the impression, to give it utterance and expression. To be thus learned it is not necessary to be for ever bending over dull diagrams and untangling knotty problems. The field of art is too wide, its privileges too free for this. The artist's best school is abroad, in the bright, beautiful world of nature, for ever developing some new subject for admiration, and tempting his imitation. Nothing on which his eye can rest that does not teach him lessons of his art, when once his perceptions are awakened and trained to their comprehension. Endless as may be his work of knowledge, so are his resources; while others plod on a duller way through life, he reaps while he sows, and bright blossoms mingle their perfume with the ripened fruit, which repays his labors and makes glad his toil.

73. In resuming the consideration of the geometrical operations of perspective, we are naturally led back to the beginning, but to that beginning with a degree of preparation that leaves little more to be required than mere hints to assist the student in the application of the principles of the art, with which he must be already familiar. It is scarcely necessary to remark that we must have a distinct and definite idea of the forms and objects we desire to place in our picture under the influence of the laws of perspective. We must consider them as real and tangible, and upon the basis of this knowledge we are enabled perspectively to define their positions, proportions, parts, and details. In many cases we may be compelled to have recourse to imaginary data in the course of our operations, but still these data, governed by harmonious

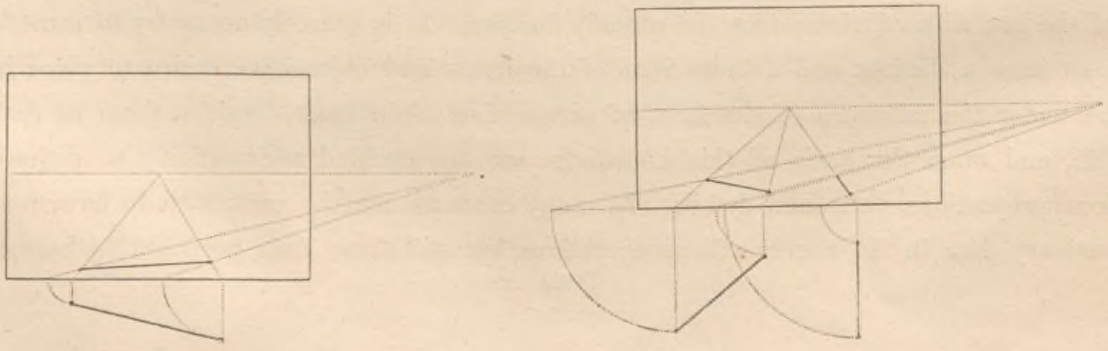
laws are sufficiently reliable for our purposes; brought, as they are, in constant contact, comparison, and trial, with self-evident truth, they can never deviate far from it without detection, and consequently ready means of correction are thus afforded.

74. To place a Point in Perspective.—Although this is but the repetition of an operation which has been repeatedly performed already, it comes in place, as the beginning of our geometrical exercises. Here we have no other geometrical plan than an indication of the actual



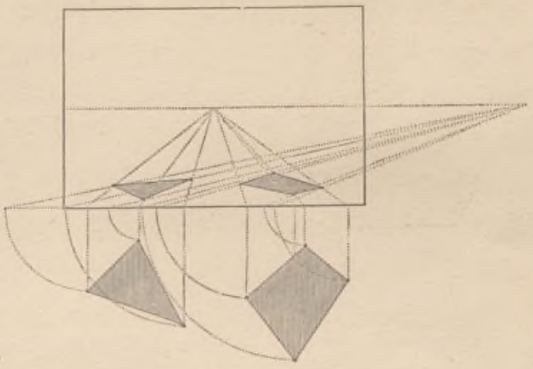
distances of two given points (A and B) from the base line, which distances being carried to the base line, as indicated, and repeated thereon, by arcs, or measurement, give two points (a and b) equivalent to the diagonal points of squares equal to the distances of A and B from the base line. Hence the lines connecting the points (a and d) marking the distances of A and B to the base line, with D, the point of sight—and the connexion of the diagonal points (a and b) with C, the point of distance of the picture, give in the intersection E the perspective position of A, and in F that of B—under the circumstances of C D C, the line of the horizon—D, the point of sight—D C, the distance of the picture, and A a, B d, the distances of A and B from the base line of the picture.

75. To place a Line in Perspective—having once secured its extreme points, as above,

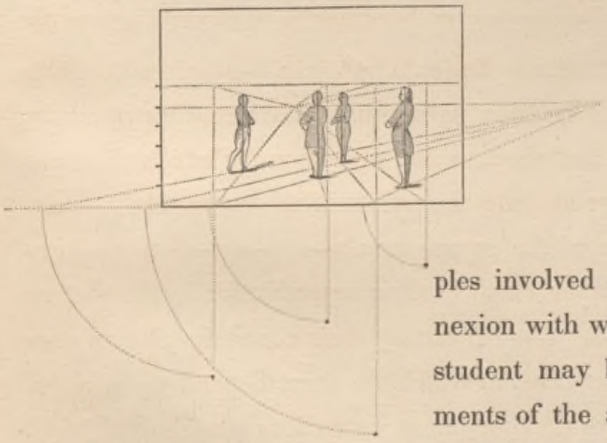


will certainly present no difficulty, no matter in what direction that line may be in reference to the base line of the picture. That done, it will be as easy to place three points in perspective as two, and four as three; therefore—

76. To place a triangle or irregular figure in perspective, by merely connecting such points thus attained, is a process equally as plain, without regard to the distinction between parallel or oblique perspective (48). All that is required to be known is the actual position in which it is desired to place such figures on the perspective plane in reference to the base line. In this example there is not a single line of the figures either at right angles or parallel with the base line; hence, not one in their perspective representation seeking a vanishing point in the point of sight, or running parallel with the base line and line of the horizon, as in the numerous instances of the square lying parallel to the picture, to which we have so often referred, and which must be sufficiently familiar to the student to render a repetition unnecessary; nor would it appear more requisite to renew our example.

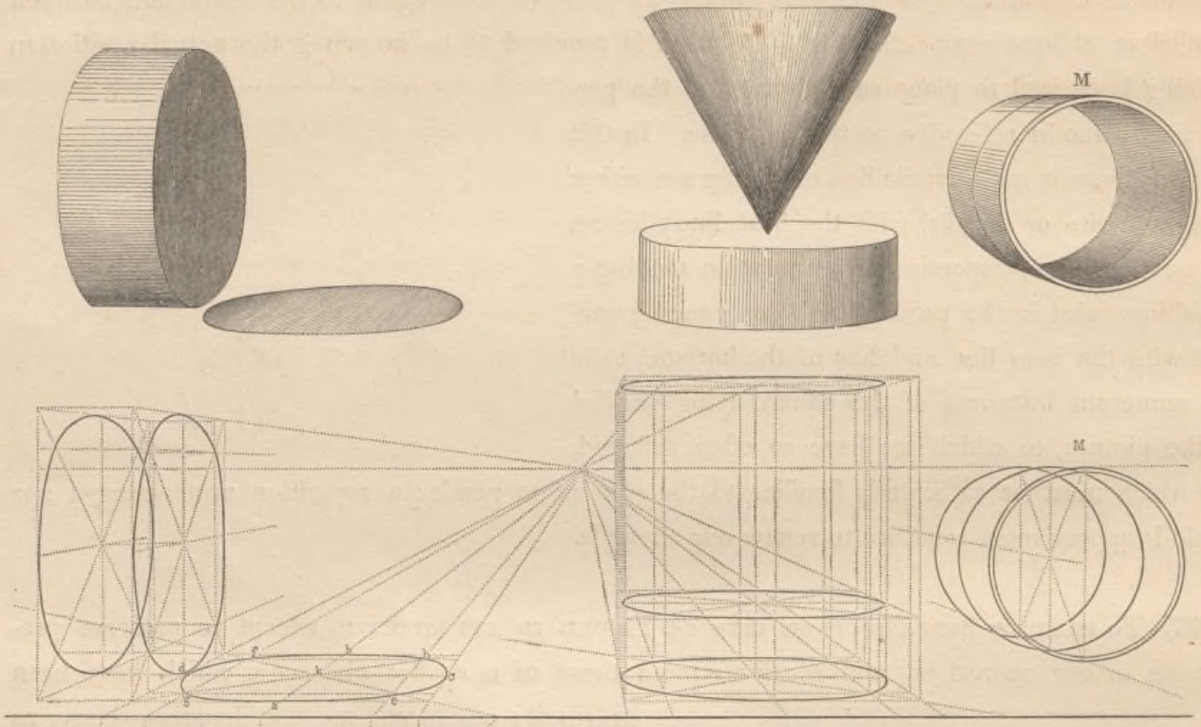


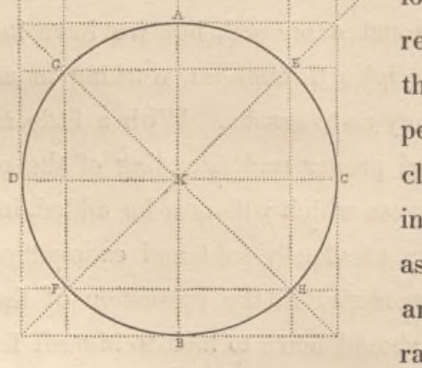
77. To place a perpendicular line or figure in perspective, except to preserve progression in our operations, and recall to mind those of a similar character which have been previously considered more at length.—Here, as in the case of all before us, we have no square or its diagonal expressed, but we have its governing principles throughout, working in as perfect harmony as to results. With a little careful practice and proper understanding of the principles involved in the few cases which will now be added, in connexion with what has been previously said and exemplified, the student may be safely considered in the possession of the elements of the art, and he should learn to look to himself for the perfection of the knowledge he may require, rather than to desire that all should be prepared for his hand. In the field of art, he that would reap must toil, however light may be made that toil if entered upon with a right spirit. He toils most painfully



who pursues its course in darkness and obscurity, and the light of truth is surest gained by earnest seeking.

78. To PLACE A CIRCLE IN PERSPECTIVE, whether as a simple form, lying flat upon the perspective plane, perpendicular to it, or in any other position—or taken as the basis of more solid

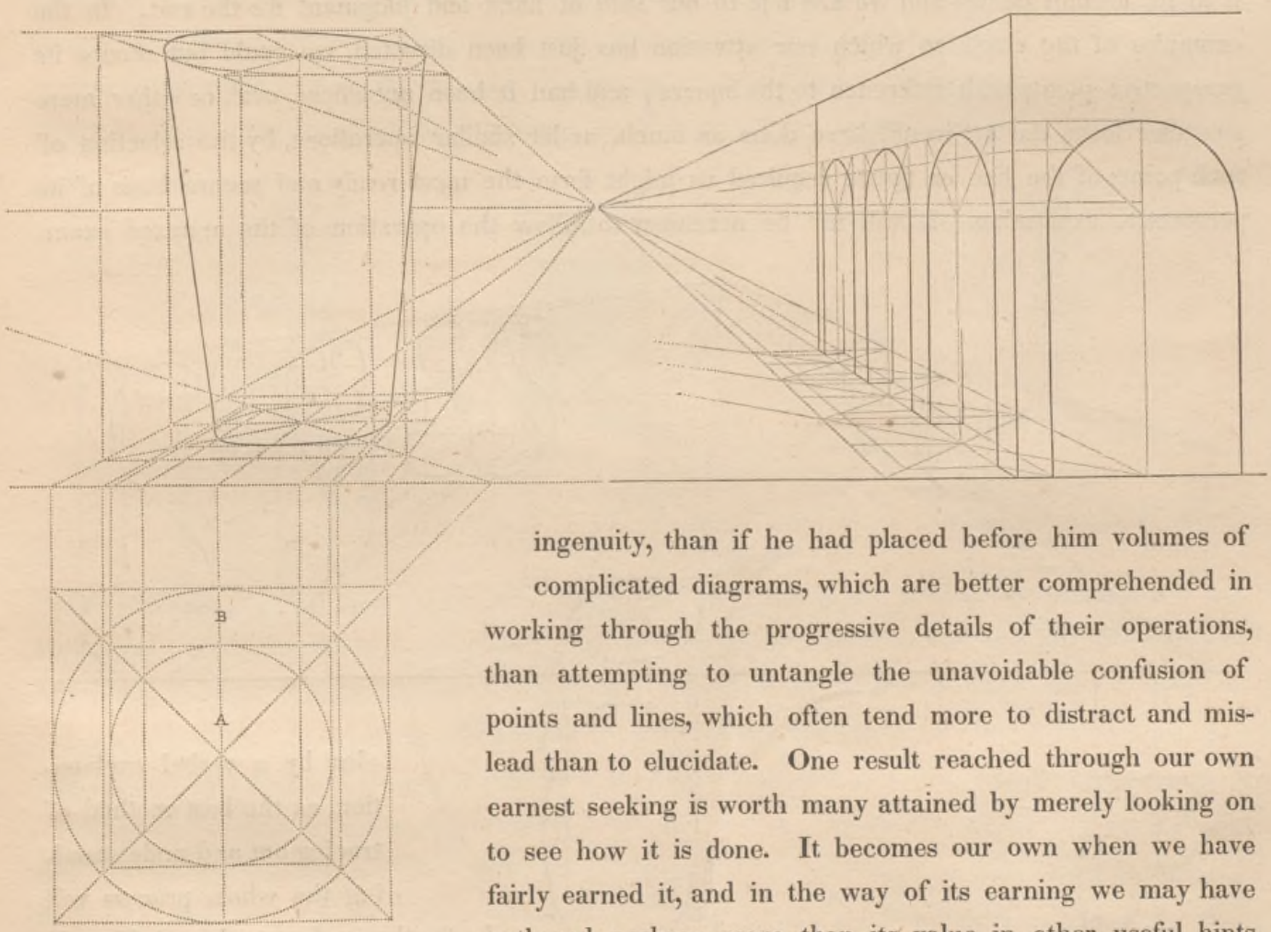




forms, such as the cylinder, cone, etc.—requires to have recourse to its relation to a square, as best illustrated by the examples, and the working operation by which they are perspectively produced; the points of the contact of the circle with those of the square, as A B—C D—E F—G H—K—forming the basis upon which in their reproduction in the picture as a b—c d—e f—g h—k, we can by their connexion, by an easy and harmonious line, in which we must depend upon accuracy of the eye and judgment, as well as decision of hand, attain the desired end. If the operation holds good in one case it will in another, and we have but to transfer such points to other required positions, under precisely the same circumstances that we would if we desired merely to place the square itself in

perspective. In the example M, the operation is more simple, from the parallel position of the circle in reference to the base line; here we have but to decide upon the central points, and the assistance of the compasses secures the circles.

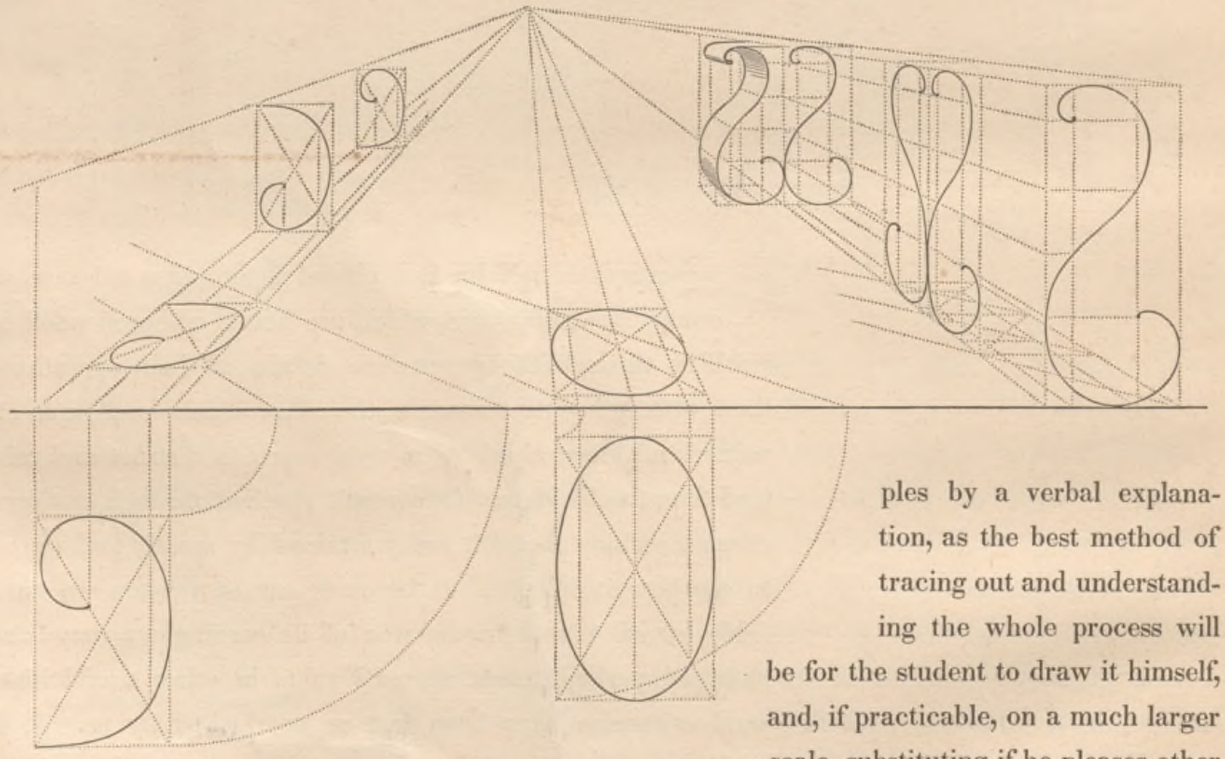
79. To PLACE TWO CIRCLES OF DIFFERENT DIAMETERS, LYING HORIZONTALLY, ON A COMMON CENTRAL PERPENDICULAR, is but a similar process, as the example will show. To carry out this operation in the numerous cases in which it is applicable, such as columns, vases, and the like, would be an endless undertaking; and the student can for himself do better, by exercising his



ingenuity, than if he had placed before him volumes of complicated diagrams, which are better comprehended in working through the progressive details of their operations, than attempting to untangle the unavoidable confusion of points and lines, which often tend more to distract and mislead than to elucidate. One result reached through our own earnest seeking is worth many attained by merely looking on to see how it is done. It becomes our own when we have fairly earned it, and in the way of its earning we may have gathered perhaps more than its value in other useful hints and points of knowledge, which would otherwise have been lost or overlooked by us. It is scarcely necessary to give a rule for the management of the semicircle, or any portion of the circle taken separately, as that which serves for the whole must hold equally good for a part. Above we have an example of a method—

80. To place a line of arches in perspective, which we leave to the student without remark. If it should puzzle him a little at first, it will be all the better for the exercise of his ingenuity. There is no line therein that has not its use and meaning, and every principle of the art connected with the operation has been, in some place or other, already explained.

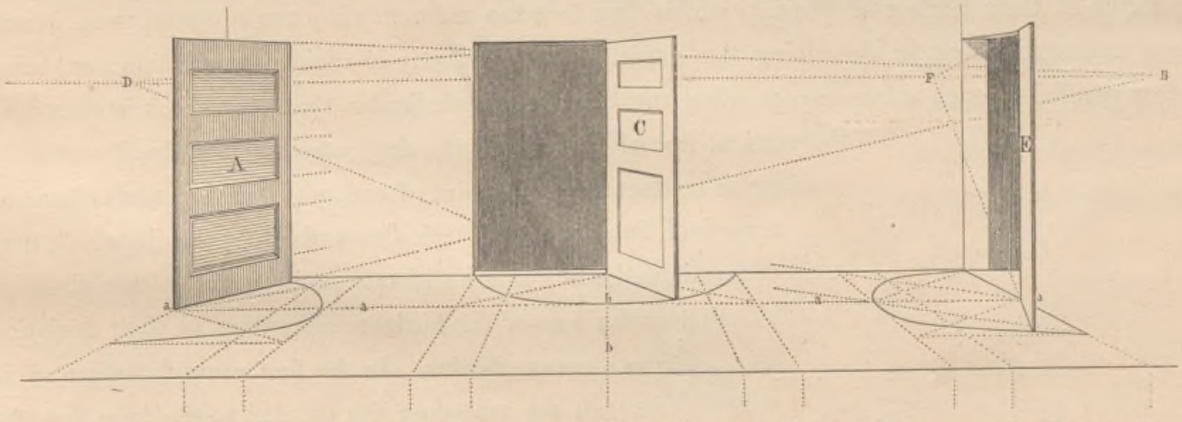
81. If attention thus far has been almost exclusively directed to the perspective of regular forms and figures, it is that its rules are more plainly demonstrable with reference to them than others of a more complex character. As soon as we leave right lines, all the art can do for us is to fix certain points, and we are left to our skill of hand and judgment for the rest. In the examples of the circle to which our attention has just been directed, we could but secure its perspective points with reference to the square; and had it been an ellipse, oval, or other more irregular form, the art would have done as much, under similar operations, by the selection of such points of the line or figure required as might form the most ready and secure basis of its perspective expression. It will not be necessary to follow the operation of the annexed exam-



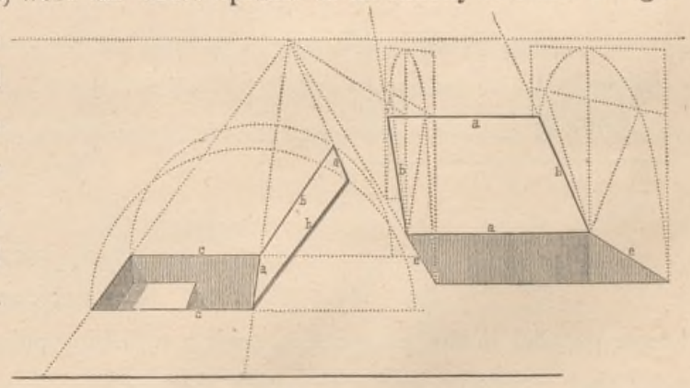
ples by a verbal explanation, as the best method of tracing out and understanding the whole process will be for the student to draw it himself, and, if practicable, on a much larger scale, substituting if he pleases other forms than those given, and under different circumstances of position, distance, etc. In immediate connexion with the operation of placing the circle or any of its parts in perspective, we

are led to its application in reference to open doors, shutters, box-lids, and such like, moving on central points or hinges; for in the opening and shutting of a door it describes nothing more nor less than the arc of a circle, on which arc, in connexion with its central point, we have our governing points. We must therefore look to the circle as the basis of our rule in all such and similar cases.

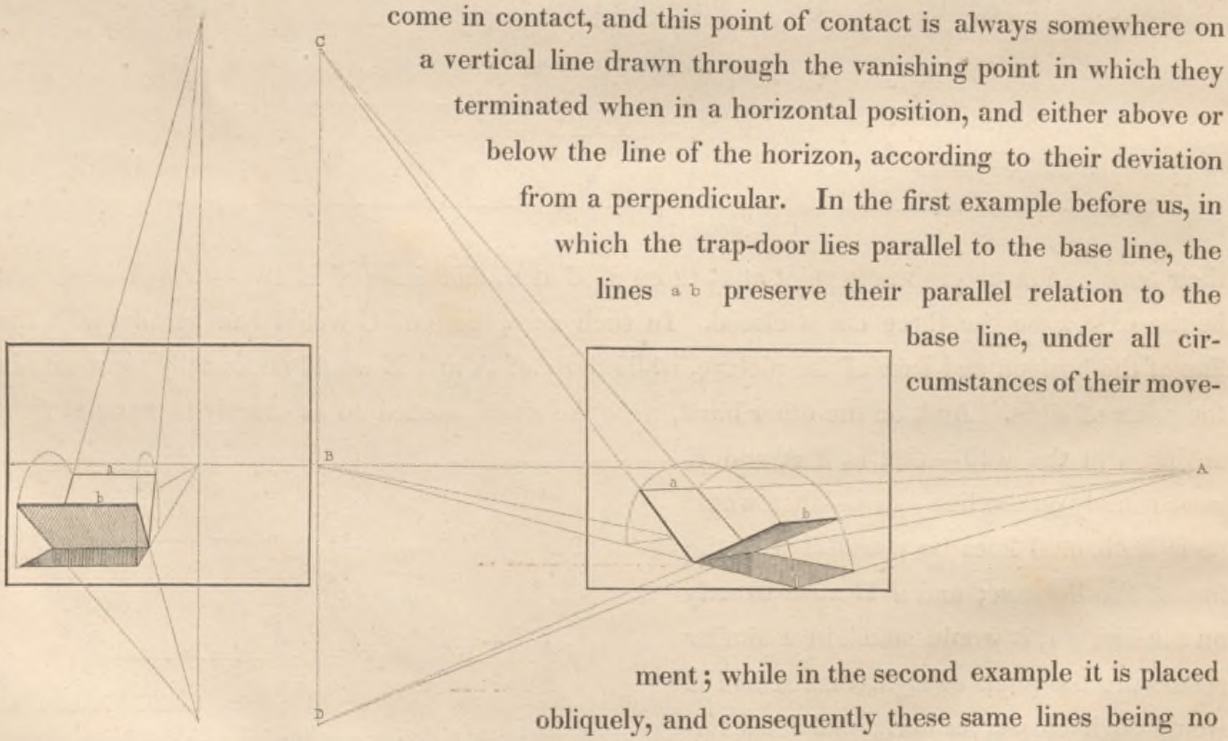
82. To place an open door, and such like, in perspective.—In reference to the example, the simplicity of this process will at once appear, the perspective plan of the semicircle forming the basis of the operation. The example, however, illustrates another point, to which reference was made some paragraphs back (47, 76), as well as on other occasions. We have, in no one of these open doors, their horizontal lines terminating or vanishing in the point of sight, or running parallel with either the base line or line of the horizon; but still they seek on the line of the horizon vanishing points in harmony with their position, as all the horizontal lines of A find



their termination or vanishing point at B, those of C at D, and those of E at F—which would not be the case were the three doors closed. In such case, those of C would run parallel with the line of the horizon and base of the picture, while those of A and E would necessarily terminate in the point of sight. And, on the other hand, were the doors opened so as exactly to stand at right angles with the wall—that is, if A and E were exactly on the line a a a a—then would their horizontal lines be *parallel* with the line of the horizon; and if C were exactly on the line b b, it would stand in a similar relation to the point of sight that A and E would do if closed, its horizontal lines terminating in the point of sight.



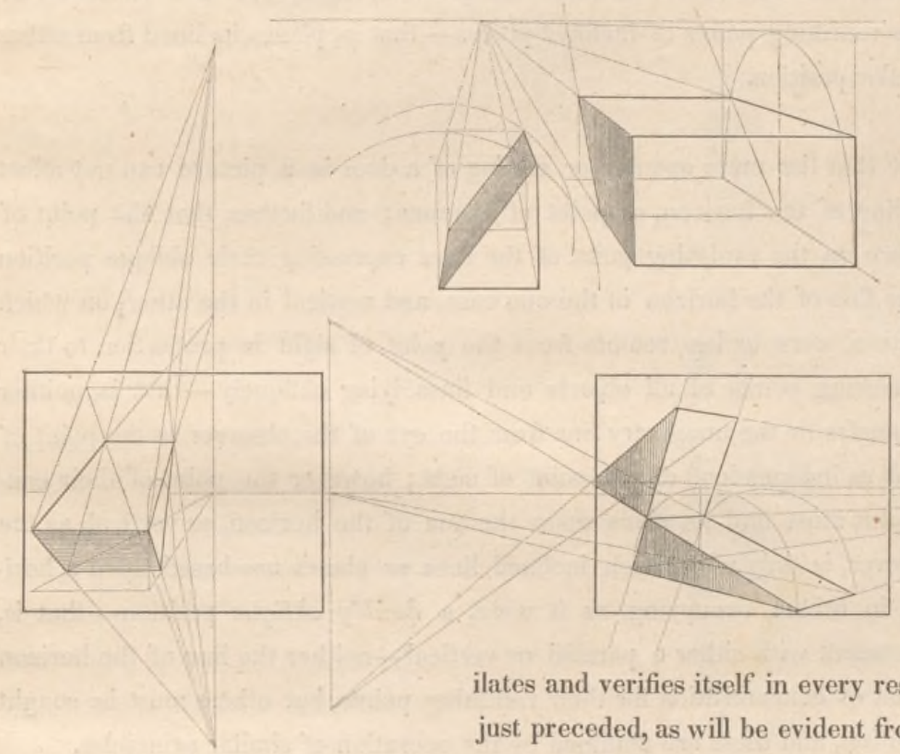
83. To place in perspective an open trap-door, or any other object, in a position neither horizontal nor perpendicular, is a process somewhat similar to that we have just had under consideration, and which the last example on the preceding page sufficiently illustrates. If these doors were closed, their outlines would as perfectly harmonize with the base line and point of sight as a square or any other rectangular figure occupying a parallel position in reference to the base line; but when opened or moved from their horizontal position, the lines of their sides (a a—a a), which still retain that position, the one fixed on a central pivot by its hinges, and the other describing an arc of a circle about that centre, alone continue to harmonize with the point of sight, by seeking a vanishing point therein, or the base line by remaining parallel with it. The others (b b—b b) either preserve a parallel with themselves, as in the first figure, having started, as it were, in that relation to each other when the door was closed (as c c), while in the second figure they started from lines (e e) bearing reference to a vanishing point derived from the line of the horizon by virtue of their horizontal position which they lose the moment they are removed from it, and must necessarily seek, in describing the semicircle, a constantly changing termination; or, being never parallel to each other except when the door is perpendicular, that is, when it is even with the vertical line of the semicircle, they must necessarily, if extended, come in contact, and this point of contact is always somewhere on a vertical line drawn through the vanishing point in which they terminated when in a horizontal position, and either above or below the line of the horizon, according to their deviation from a perpendicular. In the first example before us, in which the trap-door lies parallel to the base line, the lines a b preserve their parallel relation to the base line, under all circumstances of their move-



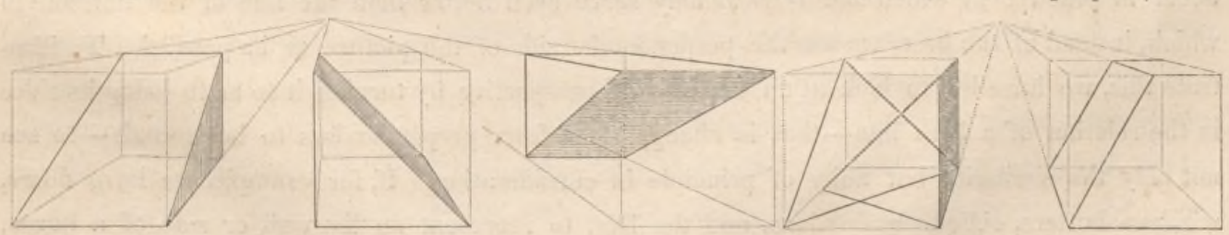
ment; while in the second example it is placed obliquely, and consequently these same lines being no longer parallel in the perspective, seek a vanishing point on the line of the horizon (as A) to which point they terminate, and with which they constantly agree in the movement of the door, while

the lines of the other sides find their termination on the vertical CD to their original vanishing point B. Now all this may seem to be a great deal to say about a trap-door, but if the pupil will give it his earnest attention, he will find in this and the previous examples the solution of one of the most beautiful problems of perspective—one well worth remembering.

84. To PLACE A PLANE, OR FIGURE, WHICH IS NEITHER HORIZONTAL NOR PERPENDICULAR, IN PERSPECTIVE.—This has already been accomplished, in part, in the operations just considered: for, if we regard such planes as the sides or parts of more solid forms, we have, in the rules by which we placed in perspective a simple door, either moving horizontally or vertically, the basis of unlimited application of the process, which assimilates and verifies itself in every respect with that which has just preceded, as will be evident from the examples annexed.



85. There are many cases, however, in which a shorter and more direct method may be adopted; one in which we assume such a solid form as the plane we desire to represent in a certain degree of inclination, may most naturally, and most advantageously for our purpose, form



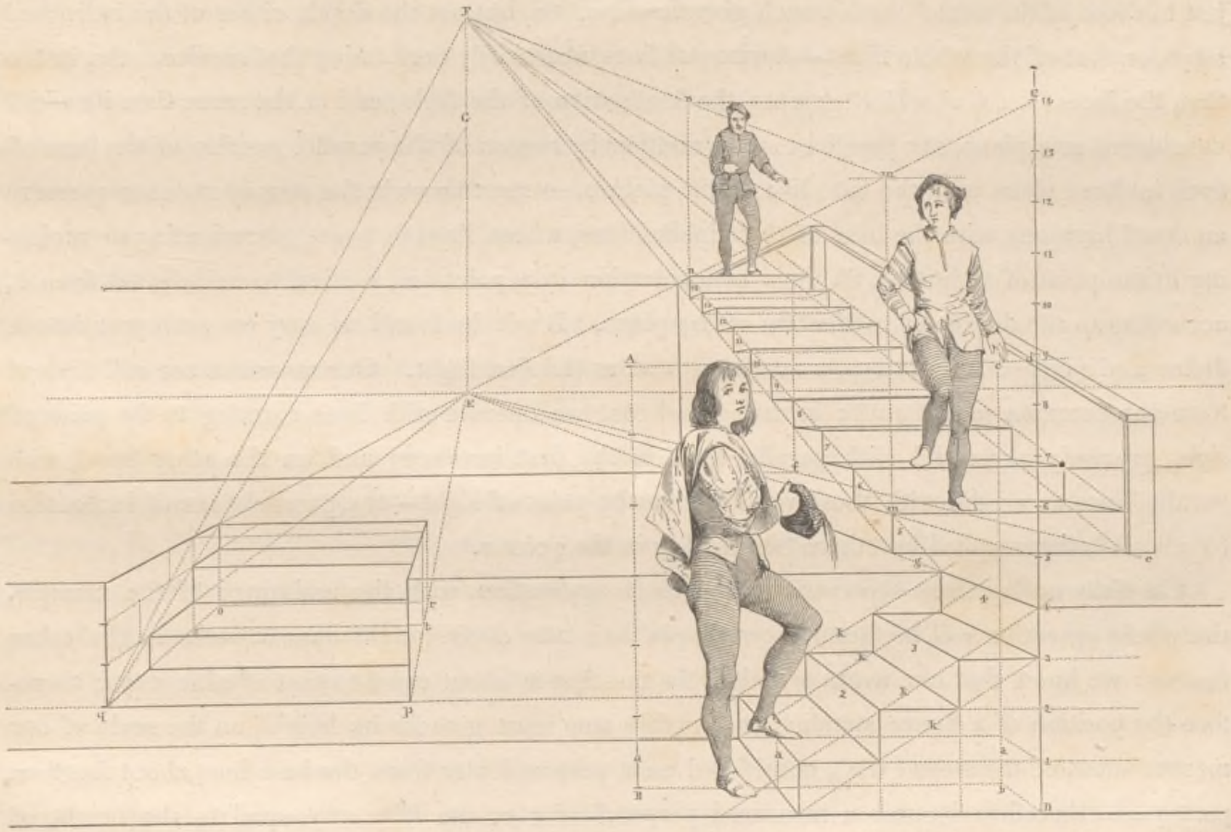
a part. With proper judgment in the selection of the assumed form, it is easy to see how manageable it may be made. A certain and decided figure once secured, the lines of its various sides, sections, diagonals, angles, etc., give all that can possibly be required as a basis. We have but to place such original figure in perspective, to acquire safe grounds of operation. If these inclined planes are intended as the basis of round or irregular forms, we must then proceed as in cases already explained, where such forms rested either on the horizontal or perpendicular plan or plane. Before leaving these examples, it is desirable to call attention to the influence of the line of the horizon and vertical line drawn through the point of sight, and their similarity of service with regard to the vanishing points of inclined planes—that is, planes inclined from either a horizontal or perpendicular position.

86. It must be evident that the mere opening or closing of a door in a picture can not affect either the point of sight, line of the horizon, or point of distance; and further, that the point of sight has no other influence on the vanishing point of the lines expressing their oblique position than its government of the line of the horizon in the one case, and vertical in the other, on which they find their concentration, more or less remote from the point of sight in proportion to their obliquity. Hence, the vanishing points of all objects and lines lying obliquely—that is, neither parallel with, nor at right angles to the imaginary line from the eye of the observer to the point of sight—may be considered as independent of the point of sight; however the point of their concentration or vanishing point must find its place upon the line of the horizon, or vertical, as the case may be. This, however, is only when such inclined lines or planes are based upon a horizontal or vertical plane: in others, occupying, as it were, a *doubly oblique* position—that is, having no coincident agreement with either a parallel or vertical—neither the line of the horizon nor vertical supplies a point of concentration for their vanishing points, but others must be sought in harmony with their position, and these are obtained by the operation of similar principles.

87. So far as the principles of the art of perspective are concerned, the vertical passing through the point of sight may be said to correspond with the line of the horizon; and many cases may occur in practice in which the vertical may serve even better than the line of the horizon; in which, instead of the base, we use the perpendicular side of the picture as its parallel. To illustrate this, we have but to look at an example of perspective by turning it so as to bring its sides in the relation of a base line—that is, change them from perpendiculars to horizontals—to see not only the similarity but unity of principle in consideration. If, for example, we have doors, window-shutters, oblique projections, and the like, to represent on the wall or side of a house,

moving or inclining, like trap-doors, etc., on a level floor, we have but to treat them as if they were on a level, by substituting the perpendicular for the base line or edge of our picture, and the vertical for the line of the horizon, in accordance therewith.

88. To place a flight of steps in perspective, as well as figures in their just proportion on such, will prove an easy operation, as it requires but the exercise and application of the most simple rules of the art. In the example now presented, we have a double scale of proportions—

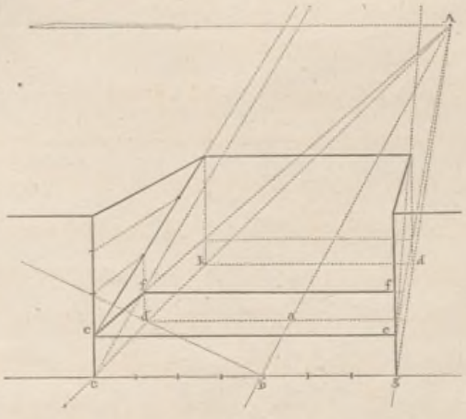


the one (A B) for the figures, the other (C D) for the steps—the one based upon and agreeing with the other. It matters not which we first assume; whether, in the outset, we adapt the scale for the figures to that of the steps, or the steps to the figures, or even which figure or which step we start with in our operation, the result will be the same—the advantage in commencing with the most prominent points only consisting in the readier attainment of accuracy by reducing from a larger rather than increasing from a less scale. It will be seen, by reference to the example, that the lines a—a give the height of the first step at the perspective distance in the picture of the first figure; and moreover, b c being equal to A B, the measure of the figure gives on C D at the point a

an equivalent to its height, equal to that of about nine steps, as indicated by the numerical points on C D. Without risking confusion in the example by the introduction of more numerical points and lettered references, we will suppose the process of producing the first four steps and the first figure evident—their proportions agreeing as well in relation to each other as to the figure—such lines as by reason of their position naturally run parallel with the base line and others seeking a concentration in E, the point of sight. The lines that, in reference to the first four steps, terminate in the point of sight, define the depth of each step, as well as the width of the whole flight (1, 2, 3, 4); but in those of the next (5 to 14), such give the direction, but not the depth, either of the individual steps, or that of the whole flight—horizontal lines necessarily performing that service. As, in the first, the lines (k, k, k, k) which express the inclination of the flight, and at the same time its width considered as a plane, are parallel to one another by reason of the parallel position of the base of such inclined plane with the base line of the picture, so must those in the second instance preserve an equal harmony with the base of their inclinations, whose lines (e f—g h), terminating or vanishing in the point of sight (E), fix their concentration in a point (F) vertical to and distant from it, according to the degree of inclination of the plane. It will be found as easy on such premises to define and perspectively to represent the second as the first flight. Our measures are still derived from one common scale (C D); in the second case we operate with lines running to the point of sight, precisely as we did with parallel lines in the first instance; and, on the other hand, with parallel lines as we did with those vanishing in the point of sight—the parallel lines of inclination (k, k, k, k) being supplied by others terminating in the point F.

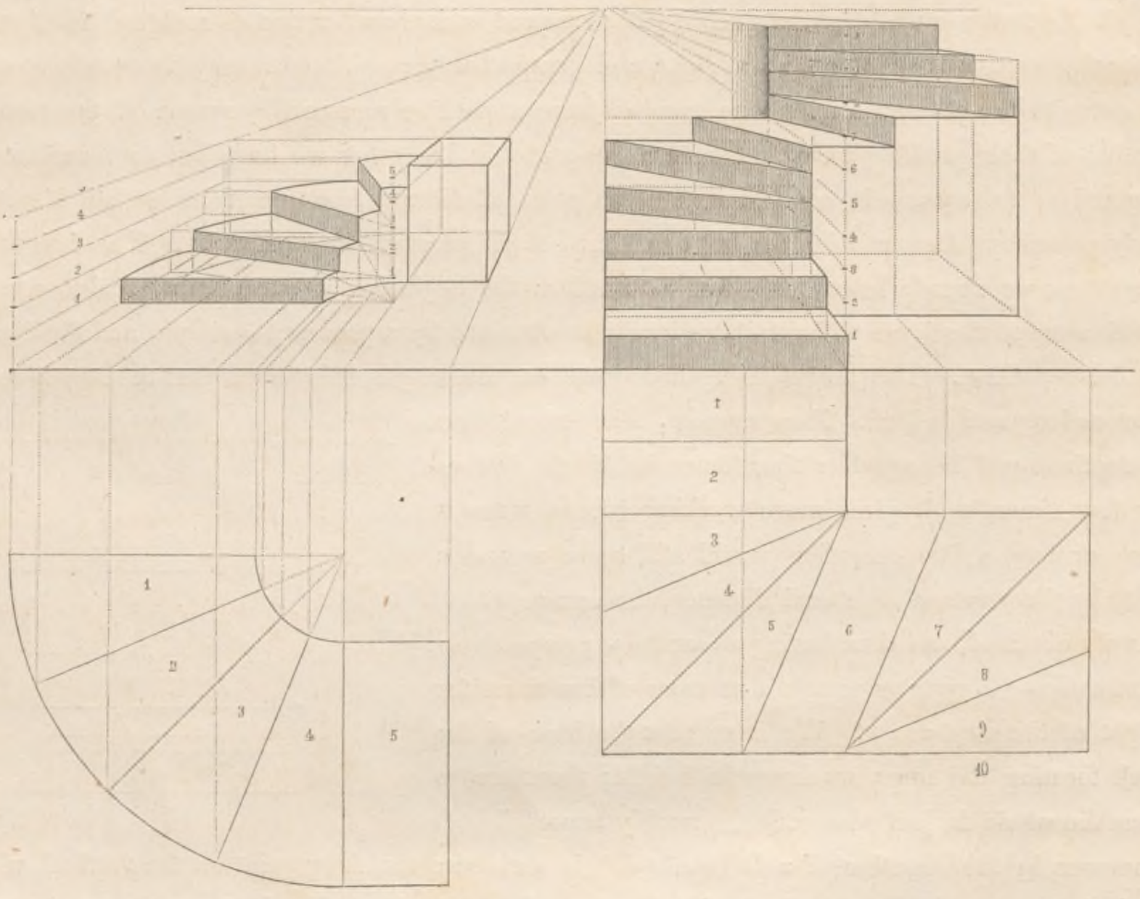
Carefully noting these observations and their application, with the assistance of the example, the whole operation will be found more simple than may at first sight appear.—As to the other figures: we know that our average height for the first is about equal to that of nine steps; therefore the position of a figure standing on the fifth step must give for its height, on the scale of our measurement of the steps (C D), considered as a perpendicular from the base line, about fourteen parts; m m therefore secures a measured perpendicular on the fifth step equal to the height of nine—and hence, by the lines m n F—m n F, the means of ascertaining the perspective diminution and just proportion of any figure or object on these steps, as well for a railing or other accessory that may be desired. With regard to the steps in the lower left-hand corner of the example, it will be remarked that by the nearer approach of the vanishing point G to the vanishing point E of the lines of their plane, they are deeper than those just considered (5 to 14), the angle of inclination (G q P) being less than that of F q P, and its base (r p—o q) longer; for if these steps were of the same depth as those from 5 to 14, their base would be as s t p q, and F q P their perspective angle of inclination.

89. As to the actual depth of each flight, measured on its base, or that of each individual step: in the first case it is plain enough at sight, and perspectively considered it may be equally so with reference to the others. In the one case we have a positive measure by reason of the parallel relation of their profile plan with the base line; and in the other we have but to recur to the diagonal of the square, in connexion with the point of distance, for equally as certain if not as ready premises. Let us take the last-considered flight of steps in illustration. The *height* of these steps we already know, for it was assumed in the beginning as our original scale, or taken in reference to the figure; if not, it can easily be obtained by a process too simple and familiar to require repetition. The height being laid down on the length, it is found that the step is seven times as long as it is high. Now suppose, it is desired that its depth should be equal to four times its height (let us say four times, as it gives more working room; were it more or less, a like operation would still serve as well): aided by the points of sight and distance, the square a b c d is easily obtained, and thus having d c and a b perspectively equal to c b—d a, gives as certain a measure of four times the height of the step as c b. We have now the base of the block forming the step; we know its height; therefore, to place the whole in just perspective is readily accomplished. Moreover, by the direction of a diagonal (c f), is secured a vanishing point on the vertical, which gives the accurately-defined plane of inclination of any number of such steps; or, on the other hand, if it is desired to assume the base (c g h k) of the whole flight as our premises, by its divisions and proportions like results may be attained.



90. To PLACE CIRCULAR, CURVED, OR OTHER THAN RECTILINEAR-SHAPED STEPS, IN PERSPECTIVE, is effected by the application of rules and methods already given, with reference to such like forms in their relation to rectilinear shapes.

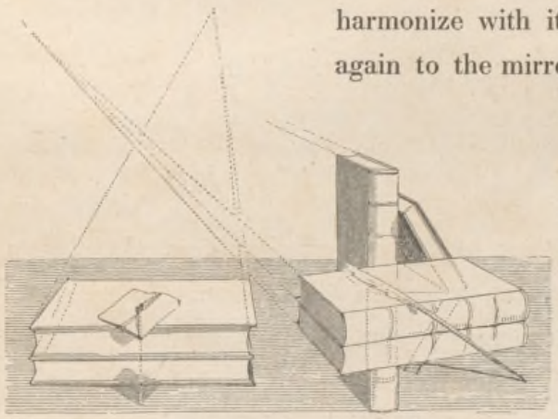
91. To PLACE IN PERSPECTIVE A WINDING OR SPIRAL FLIGHT OF STEPS, requires an operation more complex and laborious than difficult—one involving a perfect intelligence of the principles of the art, and one of the most profitable exercises that can possibly try the knowledge and ingenuity of the student. Complex and incomplete as may appear the example on the next page, without other explanation, it will be found perfectly intelligible, to those who have fairly investigated and practically verified for themselves the operations of the rules of the art.

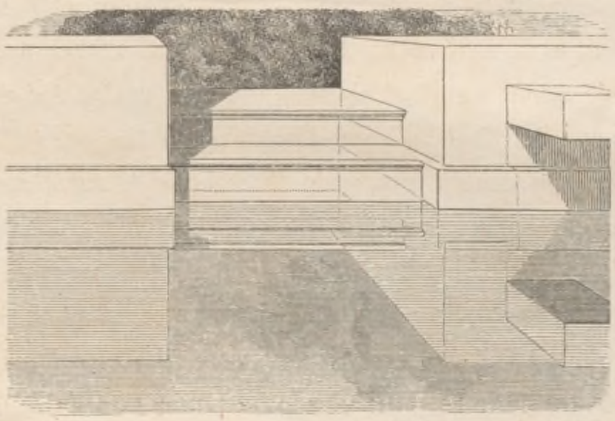


92. However incomplete a work on perspective may appear, without its rules in reference to shadows, the artist-student, whose eye now looks on nature alive to the just perception of the influences of the art, who can counterfeit the reality in conformity with its laws, can scarcely need a recipe for its shadows; falling, as they do, in masses, more or less defined, of position and form, modified and influenced in their shapes by the recipient object on which they are thrown, and those by whose intervention with the source of light they are produced; perspective pictures traced, as it were, on perspective pictures, and mutually developing each other in perfect harmony with the great and leading truths of the art; doubling the resources of design, in the means of its expression, and placing in the intelligence and hand of the artist a power as unlimited as the mind's imaginings.

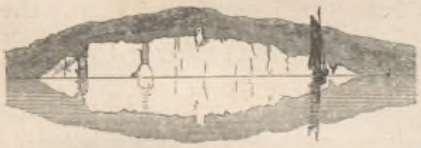
93. To PLACE OBJECTS REFLECTED IN PERSPECTIVE, needs but one general rule, requiring the reflection to be treated as a reality. Consider it, thus, an inverted duplicate, not of the picture,

but of the reality, and the way is plain. To illustrate and verify this, place a mirror level on a table, and upon it any object that first comes to hand, a book, a pen, a letter, anything—the perspective direction of the lines of the reflection will be found perfectly to harmonize with its original, and its image perfectly inverted. Look again to the mirror on the mantelpiece or wall, and remark how perfectly the perspective of the objects presented by it responds to the originals. Should the glass be not perpendicular, an irregularity, as it were a general upsetting of everything, will be perceived; for thus the perpendicular plane of its picture is thrown out of harmony with nature, and all its lines follow. The same would be the case if the mirror were placed flat, but not perfectly level, with regard to all objects retaining their horizontal and perpendicular character, but the reflected images of those resting on its surface would still harmonize with their originals, in the degree of inclination of its plane, etc.

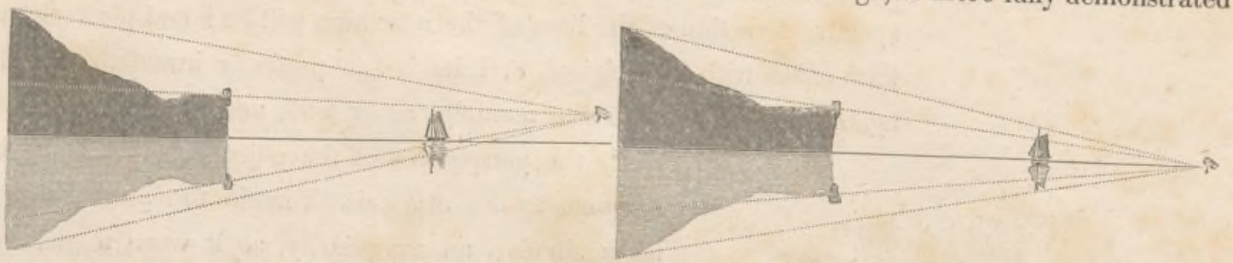




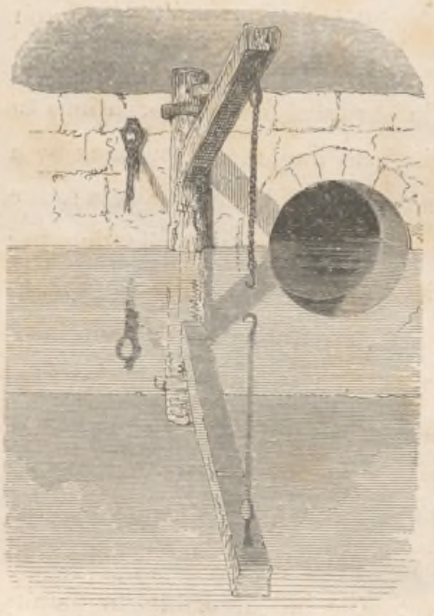
Fortunately, in our most frequent occasions to represent reflections, they are given back by a mirror, ever most true of all other objects to the level—Nature's mirror—not duplicating her perspective pictures, as presented to the eye, as if by a mere inverted tracing of their outlines, but with all the truth of an actually inverted image of the reality. Such objects as rise or occupy a position perpendicularly in reference to the mirror-like surface of the tranquil water, preserve their real proportions. Thus, the cliff that rises in an unbroken perpendicular above its base, throws its reflection to its full height; while that of the receding hill or distant mountain, although much higher, may scarcely be seen at all, though rising far above it—the boldness of the perpendicular cliff perspectively covering the inclined plane. If the point of observation could be placed exactly on a level with the water, then, and then only, would the real picture be repeated; but the slightest elevation of the point of view,



and consequently of the line of the horizon, above the level of the water, affects the general outline of everything reflected that is not perpendicular to the water's edge, as more fully demonstrated



in the annexed profiles, showing the perspective relations of the various elevations. In objects projecting over the water, as the beam in the example, the reflection will of course be naturally longer than the receding lines of the original. An arch may repeat its outer semicircle as perfectly in its reflection as it really is, and so may be also its more receding outline, but the archway itself is not perfectly duplicated. In the original we see less of its internal form than we do in the reflection, for the elevation of our point of view enables us to see farther into the reflection than within the arch itself.



Although brought to a conclusion of this chapter without having covered, as it may seem, the whole ground of perspective, the artist-student will find therein, if not a recipe for all his requirements, the elements and principles of the art sufficiently explained to enable him, upon their basis, to meet any difficulty that may be presented in the course of his practical operations. The fear of big books and elaborate treatises drive many a one from the pursuit of knowledge, and most of all, those devoted to the arts of design; whose restless spirits unwillingly bear the control of any established routine; unapt to delve in the mine of abstruse investigations, they hasten to conclusions; and, most fortunately, all their requirements of knowledge are progressive. Discovery and possession beget wants, and he who lives the longest, and knows the most, has more still to learn. In the next chapter it will come in place in some degree to review the subject of perspective as to its practical application in drawing and sketching from nature, when an opportunity will be presented of introducing at least more generally pleasing subjects for illustration than mere diagrams, (in which the author begs to acknowledge in advance the assistance with which he has been favored by many of his brother-artists, as well as the productions of those of other times), that can not fail to prove acceptable.