R.Brown pinxt. T. Sutherland aquat.

TO HIS ROYAL HIGHNESS THE DUKE OF YORK
THIS PLATE TO PERPETUATE THE HAPPY TERMINATION OF THE
CAMPAIGN OF 1814 IS MOST RESPECTFULLY INSCRIBED
BY HIS ROYAL HIGHNESS'S DEVOTED HUMBLE SERVANT

RICHARD BROWN.

THE

PRINCIPLES

OF

PRACTICAL PERSPECTIVE;

OR,

Scenographic Projection:

CONTAINING

UNIVERSAL RULES FOR DELINEATING DESIGNS ON VARIOUS SURFACES,

AND

TAKING VIEWS FROM NATURE,

BY THE MOST SIMPLE AND EXPEDITIOUS METHODS.

TO WHICH ARE ADDED,

RULES FOR SHADOWING,

AND THE

ELEMENTS OF PAINTING.

THE WHOLE TREATED IN A MANNER CALCULATED TO RENDER THE SCIENCE OF PERSPECTIVE AND THE ART OF DRAWING EASY OF ATTAINMENT TO EVERY CAPACITY.

ILLUSTRATED WITH FIFTY-ONE PLATES.

By RICHARD BROWN,

ARCHITECT AND PROFESSOR OF PERSPECTIVE.

LONDON:

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1815.

TO

JOHN SOANE, ESQ.

ROYAL ACADEMICIAN, PROFESSOR OF ARCHITECTURE, FELLOW OF THE ANTIQUARIAN SOCIETY, MEMBER OF THE ACADEMIES OF PARMA AND FLORENCE, ARCHITECT TO THE BANK OF ENGLAND, &c. &c.

SIR,

I AVAIL myself of your kind permission to inscribe to you the following Treatise on Perspective. To whom, indeed, could I with so much propriety dedicate it, as to one whose public works, and whose scientific and instructive lectures, evince so accurate and profound a knowledge of the subject? Your skill is proclaimed by the superb edifices erected under your superintendence, and the universal voice of men of the most refined taste is loud in your praise, to add to which any attempt from me would be superfluous.

I have the honour to be,

With the greatest respect,

SIR,

Your much obliged

and very humble servant,

THE AUTHOR.

PREFACE.

To enter into any laboured encomiums on the importance of Perspective, and the use of painting, would be needless. The absolute necessity of an intimate acquaintance with its principles and its practice, in order to arrive at excellence, or even mediocrity in the imitative arts, is now universally felt and acknowledged. A practical treatise on Perspective and Painting needs, therefore, no apology.

Architecture, sculpture, and painting have ever, and justly, been held in the highest esteem by all polished and civilized nations. As the riches, the power, and the real greatness of a people have increased, the polite arts have been sedulously cultivated; and as the various nations of the earth have by turns relapsed into their primitive barbarism, these arts have been neglected and lost.

The ancient Greeks and Romans have left us innumerable proofs of their exquisite skill in architecture and sculpture, and if we may believe their historians, they equally excelled in painting. The specimens of ancient painting which have been found in Herculaneum do not, however, perfectly answer to the animated and exaggerated descriptions of the writers of those days. The ancient artists were perhaps inimitable in the delineation of single figures, or groups of figures in the same line. The faithful expression of the countenance, the gracefulness of the attitude, and the easy flow of the drapery, have rarely been excelled; but they were utterly ignorant of Perspective. They knew not how to graduate their objects in proportion to their distances; and the remoter figures often equalled and sometimes exceeded in bulk those which occupied the fore-ground. An unnatural and unpleasing effect was thus given to their most laboured performances. It will be merely necessary to refer to some of their most admired tesselated pavements and basso-relievos for a sufficient illustration and proof of these observations.

As Perspective depends so much on a knowledge of the laws of optics, and these were formerly little understood, we may easily account for the deficiency of the ancients in its practice. It is, however, somewhat remarkable, that among the numerous works of antiquity which have descended to us, nothing is to be found expressly on the subject of Perspective. Vitruvius, the first author who notices the sci-

ence, slightly mentions some essays on this art; but had they possessed any merit, or had they been adopted as containing the acknowledged rules of practice, it is scarcely possible that they would have been suffered to perish. Perspective may, consequently, be justly ranked among the inventions of latter times.

When the Roman empire was overthrown by the irruption of the barbarians in the sixth century, the polite arts were buried in its ruins. A long period of darkness and ignorance succeeded. About the beginning of the thirteenth century painting, sculpture, and architecture once more revived; but a considerable time elapsed ere the importance of Perspective was acknowledged, or its practice universally adopted. During nearly two centuries, the painter confined himself to a scrupulous imitation of the minutiæ of every object; and the correctness of that imitation constituted, as it yet does in the estimation of the ignorant, the value of the composition. Each individual hair of the human head was delineated, even the very pores of the skin were accurately represented; every blade of grass, every leaf on the trees, every stone in the building, was faithfully depicted. No attention was paid to the diminution of objects according to their distances, or to any of the rules of Perspective. At length this was discovered to be a representation of what the mind knew the objects to be, rather than the form under which they actually appeared to the eye. Though in one sense the delineation was accurate, the effect was false and unnatural; for when the eye is at a sufficient distance to comprehend the whole outline of a figure or a landscape, the minute parts disappear and are lost.

At the latter end of the fourteenth and the beginning of the fifteenth centuries, some attention was paid to Perspective. Masaccio, a native of Tuscany, made it his peculiar study. He was soon followed by other masters, and particularly by Andrea Mantigna of Mantua. Yet the art of Perspective was at this period little more than a new method of delineating objects according to their distances and relative positions; it depended on no certain and unerring principle, nor on any mathematical rule, but was governed by the caprice of the fancy, or the judgment of the eye. But at the end of this, and at the beginning of the sixteenth century, which proudly boast of an Albert Durer, a Leonarda da Vinci, a Parmegiano, a Julio Romano, a Paulo Veronese, a Michael Angelo, a Rubens, a Raphael, and a Titian, Perspective first assumed the form of science. It was now reduced to mathematical principles, and these principles were beautifully elucidated and rendered universal by Brook Taylor, in the beginning of the eighteenth century.

When the absurd practice of delineating all the minutiæ of objects was discontinued, the compositions of the painter assumed a new character. The different parts of the work were now *massed*. This gave breadth to the lights and shadows; it enabled the artist to blend his colours in a pleasing and natural manner, and wonderfully added

to the effect and the sublimity of his productions. The great masters of the Venetian and Lombard schools, and afterwards the Flemish and Dutch painters, carried this principle of massing to an extent beyond what ordinarily appears in nature; for instead of making their lines perfect and distinct, and keeping their tints pure and separate, the various colours were now blended together with a playful, airy lightness and a kind of indistinct sketchiness, and the irregular masses of light and shade harmoniously softened into each other, in a way which nature only exhibited under very peculiar circumstances. This style of painting was invented by Georgione, the Venetian, about the beginning of the sixteenth century, and perfected by Titian about the middle of the same century.

Numerous essays on Perspective have since appeared in various languages, yet it has been generally remarked, that an easy, familiar, and practical treatise on the science was wanting. The figures and the objects by which most writers on Perspective have illustrated their rules, have been uninteresting and almost disgusting, and such as seldom occur in practice. They have feebly conveyed the information required, and have possessed little resemblance to the objects which daily present themselves to the painter's view. Some authors have been voluminously prolix; others, aiming too anxiously at brevity, have been obscure; some have drawn all their figures parallel, others have represented them uniformly angular; many have been rigidly mathematical, and others wholly mechanical: few have recollected, that it was their professed object to instruct and to complete the painter, not the mathematician. Some writers, and not a small number of students, have imagined, that the rules of Perspective are few, simple, easy to be understood, and universal in their application. The principles of every science are few in number, and generally easy to be comprehended; yet if they are studied in a superficial manner, excellence is in vain expected. The great difficulty in every science is to apply the few and simple principles on which it is founded to the endless variety of cases which occur. In nothing is this more evident than in Perspective. The student will easily understand the rules of the art, as they apply to triangles, squares, concave, convex, or plane surfaces; but when he attempts to delineate an object in which all these figures are strangely and confusedly blended, he is at an utter loss. The theses, the scholia, the corollaries, the lemmas, and the algebraic and mathematical symbols of our modern treatises, will render him little assistance.

It has been my aim in the following work to apply the principles of Perspective to a variety of the most common, pleasing, painter-like, and difficult, but useful objects; and also to shew how to shadow and colour the same. This has necessarily occasioned a greater number of plates. I have not burthened the mind of the young student with too much unnecessary theory, an error into which almost all the writers on Perspective have fallen. My rules are few and concise, but carefully stated and proved,

and then applied to the most common and picturesque objects. How far I have succeeded in producing the plain, correct, practical, and interesting work, the want of which was universally acknowledged; how far I have been enabled to simplify and generalize my subject, and to express myself intelligibly to the learner, and satisfactorily to the proficient, I leave the public to determine.

The student will probably sometimes think me too prolix; the mathematician will perhaps deem me too brief. I have been anxious to facilitate the progress of the learner as much as possible; but I well know, that eminence in the art is only to be attained by the slow and regular acquisition of elementary knowledge. Sir Joshua Reynolds, in his admired discourses on painting, delivered at the Royal Academy, justly observes, that "the impetuosity of youth is disgusted at the slow approaches of a regular siege, and desires, from mere impatience, to take the citadel by storm. Thus he wishes to find some shorter path to excellence, and hopes to attain the reward of eminence by other means than those which the indisputable rules of art have prescribed. But let no one be seduced to idleness by specious promises. Excellence is never granted to man, but as the reward of labour."

WELLS-STREET, OXFORD-ROAD,
May 2, 1815.

INTRODUCTORY DISCOURSE.

PERSPECTIVE teaches us to draw or delineate on various surfaces, but generally on a plane surface, as a strained canvas or a sheet of paper, a true representation of the objects in view or in idea, according to their distance and relative positions, as they appear from any station real or imaginary. To form a clear idea of the nature and principles on which perspective is founded, it is necessary that the objects to be represented or drawn should be considered as beyond the plane of delineation; or, in other words, having fixed on the station from which you intend to take your view, imagine a transparent plane interposed between the eye and the objects, and through which you have distinct vision of them on the other side. Suppose the plane of delineation to be a window, or plate of glass washed over with strong gum water or isinglass, which, when dry, will retain the traces of the pencil; it will then be evident, that if you accurately trace on the glass every line or feature of the objects as they appear on the transparent plane, while the eye is fixed looking through a sight-hole within reach of the window, the result will be the true lineal perspective representation, or picture of all the objects on that plane. To perform this on an opaque surface by mathematical rules, is what is properly called perspective.

By this science objects may be so drawn as to be taken for the objects themselves seen through the aperture of the picture-frame; but to produce this effect, the rays of light must come from the several parts of the picture to the spectator's eye, in the same direction, and with the same strength of light, shadow, and local colours as they would do from the corresponding parts of the objects. An extraordinary instance of the complete optical deception which perspective is capable of effecting, is recorded by Pliny, who relates, that the representations of houses were so accurately delineated on the scenes of a theatre*, that the birds attempted to alight on the deceptive roofs; and that a dog was so completely deceived in a perspective piece, painted by Dento on a wall, representing a flight of steps conducting to an open door, that being pursued, he rushed with such impetuosity towards this imagined outlet that he was killed on the spot.

All objects are seen perspectively to every eye and in every situation; but no objects appear to the eye under the figure which we know them to possess, a sphere alone excepted, whose contour is every way bounded by a circular line†. A circle appears as a circle only in one point of view, namely, when the eye is perpendicular to the centre of its plane. In every other position it appears an ellipsis, more contracted or distended according to the elevation of the eye. If the circle be horizontal, it will approach to its original form in proportion as

* The ancient theatres had no roofs, but were merely inclosed with a circular wall.

† When a globe is represented in a picture, the surface of which is a plane, it can only be a circle when drawn in the centre of that surface, or directly opposite the eye; in any other part it will be elliptical, and be proportionably elongated as it recedes from the centre of the picture. This must be evident, when we consider that the globe is here projected in plano.

the eye is raised above the plane of the circle ; and, on the contrary, in proportion as the eye is depressed or brought down, the more contracted will be the ellipsis, until it assumes the appearance of a right line, and this takes place when the eye is in the plane on which the circle is described. The top of a barrel when standing on its end, will assume an elliptical form, though we know it to be circular ; and the different articles of furniture in a room, in an elevated point of view, will appear to stand one over the other, and the legs of the tables and chairs will seem unequal in height, though we know them to be perfectly equal, and the whole to be standing upon a level floor : so objects in the street, or suspended from a ceiling, will all have the same appearance. It is likewise manifest, that if two objects of equal height are placed at different distances from the spectator, that which is nearest will appear higher than the other. This may easily be proved; for by looking up a long avenue, or a street, where the houses or trees are all of equal altitudes, they will appear to contract in their dimensions in proportion to their remoteness, and at last will seem to meet together in a point. This accounts for the different proportions of some of the figures in a picture, which are intended to be represented at certain distances from each other.

The use of perspective is to give to objects on canvas or paper, the same relative proportions under which they appear to the eye in every possible position ; and as it is a branch of optics immediately relating to direct vision, it will enable the student to understand the material difference between the real forms of objects in nature and their representations in a picture ; a circumstance which causes much surprise, until practice renders it familiar. In fact, it is impossible to represent objects on a plane or flat surface as they really are, for we never see them as they actually exist, nor of the same form and dimensions which we know them to possess, except they are planes parallel to the surface on which they are represented.

Mr. James Malton, in his *Young Painter's Maulstick*, says, that some persons (those I imagine who are unacquainted with perspective) have supposed, that what are termed geometrical elevations of houses, are the truest representations of them : this, however, is erroneous. A geometrical drawing of a house, for instance, represents every part of it strictly delineated by the laws of geometry, which suppose the eye to be every where perpendicular to the object; every circle is drawn truly circular, and every square has its vertical lines perpendicular, and its angles right angles; all horizontal lines are drawn parallel to the horizon and to each other; and the component parts of the building, as the doors, windows, &c. are drawn similar and proportionable to the original edifice on a small and minute scale. But a perspective drawing of a house is the exact representation of it, as it appears to an observer in any given situation. Not one of the figures in the drawing exactly resembles the original, except they are planes parallel to the surface of the window or plane on which the delineation is made : circles and semicircles are represented as ellipses and semi-ellipses, and squares are drawn under the form of trapeziums ; not one of the angles being right angles, nor the horizontal lines parallel, as in the original, but converging towards each other; neither are the doors or windows of an equal width or height, although they are known to be equal and alike in the original building. Now this is the general language of nature, and the only image ever presented to our eyes. A house can never be seen geometrically, but perspectively it always may : yet it appears, that perspective drawings (when taken I imagine from too near a point of view) are not so well recon-

tiled to the untutored eye as geometrical ones, which present neither a natural nor a faithful representation of any real object at all. This chiefly arises from our overlooking the actual appearance of objects, and knowing that houses are level at the tops and equally high at the extreme angles, we are apt to conclude that the geometrical one is the true representation, and the perspective one erroneous.

I do not mean to assert there is no utility in geometrical elevations, for they are of the utmost importance in architecture, as they give all the true proportions for the builder to work by, and without which no edifice of any magnitude could be erected. But I wish it generally to be understood, that a geometrical drawing alone without a perspective one is calculated to mislead, as the building will not appear to the eye when executed, as it does on a geometrical elevation. It is also very difficult for many gentlemen to determine from such a drawing, what will be the true form and effect of the edifice when completed; for whatever projects or recedes in the front, can only be ascertained by the plan, and from that a very imperfect idea must be formed; and many parts of the edifice, such as inner buildings, chimneys, &c. which may greatly contibute to the effect in a geometrical drawing, will sometimes disappear when the house is erected on an eminence, or in a confined situation, as a street. This is clearly manifested in Drury-lane and Covent-Garden Theatres. Great projections from the middle of a building will often cut off almost one third of the front from the view; such as the Greek and Latin crosses, transepts, &c. which are seen in many of the cathedrals. Great absurdities are frequently practised in geometrical drawings: they are accompanied with perspective pavement, and more frequently with landscapes, and violent purple air tints on the inner buildings. Whenever this is done, it deserves the greatest censure, for the building being drawn geometrically, and the landscape of course perspectively, the whole forms a strange anomalous medley composition. It would be difficult to say, where the eye should be placed to look at a picture so discordant (if indeed it may be called a picture) in order to make it appear natural. If the architect will ridiculously have landscapes annexed to such elevations, let the landscape also be drawn as an elevation, that the landscape-gardener may have the proportions, in order to execute his part.

Perspective delineations being the only true and natural representations of all objects, it follows, that there is some precise method of proceeding, and that it cannot be left to the mere guidance of the eye and the fancy. It will shortly be seen that the whole is governed by rule and performed on unerring principles. This rests on an established law in optics, that vision depends on the rays of light which are conveyed from surrounding objects in direct lines to the eye. As this law is most intimately connected with our subject, I shall here enter briefly into it, for the better understanding the nature of perspective. It is acknowledged, that all objects become visible by the rays of light, which flow from their different parts to the eye of the spectator, and those rays passing through the pupil, form on the retina, which is in the back part of the eye, an inverted image of the objects in view, with their proper colours and relative proportions, according to their distance and magnitude.

The learned Mr. Hamilton, in his complete body of *Stereography*, observes that it may seem difficult to conceive why objects appear erect, notwithstanding their image in the eye is inverted. But uprightness and inversion are relative terms; that body is upright whose top is

towards the sky, and its bottom towards the ground*. As the rays always cross in their passage through the eye to impinge on the retina, the image of every object there still stands, like ourselves, with its head in the air and its feet towards the earth, because the earth and air are inverted also; and as we refer all our sensations to ourselves, it appears to stand in the same position which we occupy: and thus we are not conscious of the actual inverted image which does exist. Since all objects appear to the mind with such proportions of colour, size, and distinctness of parts as their image possesses on the retina, it follows that the eye does not see objects as they really are in themselves, but only as they are represented on the retina, according to their situation and distance. It is by actual experience and by the exertion of the judgment, that we determine with regard to the exact size of objects, their proportions and distance. We compare their apparent magnitudes, strength of colour, and distinctness of parts, with the known magnitude, distance, and illumination of other objects. We, in fact, adopt various similar methods of comparison furnished by experience, although from long custom we make such judgments without attending to the various steps in the process. Hence the impression made by an object on the organ of sight, the perception of which is properly the sense of seeing, differs from the judgment formed by the mind concerning those objects, which may be called the art of seeing, as a bare perception of the forms of letters traced on a paper differs from the art of reading and understanding what is written. A proper disposition of the organ, and a due distance from the objects, are all that is necessary to constitute the sense of seeing†. Repeated observations and experience are requisite to constitute the art of seeing, or to enable the mind to form a true judgment of the objects from the impression which is made on the retina. Daily practice, however, renders this so natural and familiar to us, that in a short time the true idea of things seems to be immediately associated with the sensation, and the judgment, without any remarkable act of reflection, readily understands this silent language of the eye. But although the eye moves with great celerity, it can see only one object at a time. The reader at a single glance, for instance, perceives that this page is full of characters, but he cannot at the same moment distinguish each letter, much less comprehend the meaning of what he indistinctly sees.

From this facility in judging of the real form or figure of things arises a difficulty in delineating surrounding objects by the eye alone. For we are apt to give them the proportions which we know them to possess, and not those under which they appear to the eye; and it requires considerable study and care to overcome that deception, and to be able truly to distinguish between the image of objects in the eye and the idea which that image excites in the mind.

That we could gain little knowledge either of the distance, the magnitude, or the figure

* Philosophically speaking, the sky is not up, nor is the earth down; for if the sky be up to us, it must be down to the antipodes. Therefore up or down can only be referred to the centre of the earth.

† "It has been calculated, that objects are visible at the distance of 3436 times their diameter, if viewed by eyes perfectly organized, and through the medium of common daylight equally diffused from the organ to the object; but in proportion as the comparative degree of light is greater upon the object than upon the eye, this power of seeing it at a distance will be extended, and in proportion as it is less it will be shortened. We can see a burning coal by night at least one hundred times as far as we can see the same coal extinct by daylight; and the difference is proportionably great between looking out of an obscure room upon objects in sunshine, and looking from sunshine at objects in an obscure room."

of things, by the sense of sight alone, is sufficiently evident; for it is only by a comparison of different objects presented in the same picture that the mind can determine on the proportions of each. When the means of comparison are deficient, our judgment of the size, form, or distance of the object becomes either false or ambiguous; as in looking at a distant object over a level tract of land or water, for instance, where there is no variety of intervening objects, the inexperienced observer will form a most erroneous idea both of its distance and magnitude. This deception is no where greater than on looking up to the heavens; where, for want of intermediate objects by which to judge of the distance, the sun, moon, and stars appear infinitely nearer both to us and to each other, and infinitely smaller than they are known to be. Hence it is that when the sun and moon are near the horizon they appear considerably larger than when they are at the meridian, although their distance from us and their actual diameter are precisely the same. This is chiefly owing to the great refractive power of the denser air near the earth through which those luminaries are then seen, as we always see objects much magnified through a mist or fog. But the deception may be augmented by other causes; for when the sun and moon are in the horizon, they appear to be immediately over or immediately behind the remotest object in the landscape. That object is well known to be only a few miles distant; the apparent distance of the sun or moon is then little more, and seeming so near to us, we mechanically give it a greater diameter. Mr. Hamilton thinks the latter is the principal cause of this phenomenon. This he says will appear still more evident if it be considered, that in looking at any objects in the sky which have a considerable elevation, we are apt to imagine them to hang perpendicularly over some part of the earth, the distance of which place from our own station is generally conceived to be less as the angle of elevation of the object is greater. Upon the whole, in order to judge of the true distance of an object, its size must in some measure be known; and to judge of its size, its distance ought to be ascertained. When either of these is given the other is more easily determined; but when both are unknown, the usual methods of judging become useless, and recourse must be had to other rules. If a house be seen over the summit of a hill on another hill which is two miles distant, and is four times as large as another house of the same form one mile distant, or a third on a hill three miles distant is nine times as large, and so on in the same multiplying ratio, they will all appear of the same magnitude, and it will be difficult to determine by the eye alone which is farthest off, otherwise than by the air tint which surrounds them, and the distinctness or indistinctness of the several parts of each. Hence it is evident, that the size, and distance, and true figure of objects may in many cases be very uncertainly distinguished. Neither can the cavities or projections of bodies be truly judged of but by the different degrees of light and shade which their parts receive as they are more or less exposed. To determine the true image of an object, it is often necessary to know in what direction the light proceeds or falls upon it; because the rays which proceed in one direction would make some objects seem protuberant, but falling in a different direction, the same objects would appear hollow, and those parts which in one case would seem to approach the eye, in the other would appear to recede. This perplexity happens most commonly where the surfaces of objects are curvilinear. The forms of those which are bounded by planes are more easily and certainly determined. If a hemisphere were placed with its flat side against a wall and viewed at a distance, it would be doubtful whether it were concave or convex, or even whether it were not a plane, if it could not be discovered by the

neighbouring objects which way the light proceeds which impinges on it. Distance will likewise make the small parts of an object appear imperfect and indistinct, although the whole may still be seen under a considerable angle. For this reason it is usual, when objects, such as statuary figures, &c. are to be seen at a considerable height or distance, to make the features and other small parts that are designed to preserve their effect much larger in proportion to the whole than if they were to be seen from a nearer point of view, otherwise they would appear flat and indistinct, or perhaps be entirely lost; a due observance of which rule gives great beauty to every design, and shows the skill of the artist. A statue placed at a considerable altitude, and exhibiting the most exact symmetry and proportion at one elevation or distance, will perhaps lose all its charms and become exceedingly disproportioned and deformed at another. A story related by John Tzetzes pleasingly illustrates this argument. The author observes, that it was principally owing to his exquisite skill in proportion, and especially to his knowledge of optical appearances, that the celebrated Phidias surpassed all the artists of his time, and especially triumphed over Alcamenes, who was his rival in the art of sculpture. He says, that although they were both excellent statuaries, yet Alcamenes understood only the mechanic and servile part of his profession, while Phidias, being well versed in geometry and perspective, knew how to apply the rules of these sciences to the perfecting of his art. He informs us, that the Athenians having decreed a statue of Minerva to be erected in the market-place, each of those artists was ordered to exert his utmost skill. Accordingly Alcamenes carved a figure of such exquisite beauty, when viewed at a short distance, that the people of Athens, at first sight, adjudged him the prize. They were more confirmed in this decision when the statue of Phidias appeared; for he, considering at what height the figure was to be placed, had formed it accordingly, making the countenance so horribly distorted, and all the limbs so disproportioned, that it looked more like the figure of a fiend than a goddess; and the vulgar, who knew nothing of the rules of art, and judged only by the first and obvious appearance of things, were disposed to make him sensible of their resentment for the affront which they imagined he had offered to the goddess, by representing her in so vile a form. Phidias patiently endured the ridicule and reproach to which he was subjected, until both statues were erected at the appointed height. The scene was then quickly changed. All the soft strokes and charming graces of Alcamenes' figure quite disappeared; as, on the other hand, did the rough and barbarous features of that carved by Phidias; and both being now viewed at the proper distance, the former appeared odious and disgusting, and the latter exquisitely beautiful and finely proportioned. The prize was immediately taken from Alcamenes and conferred on him who better deserved it, and the applause which Phidias now received exceeded the abuse with which he had before been overwhelmed.

The same rule refers to all works of art which are to be seen at any considerable altitude: in this case all small and minute ornaments should be omitted, for if they were executed in their proper dimensions they could not be observed; on the other hand, if those ornaments which, on account of their distance, ought to disappear, be made large and strong enough to be distinctly seen, the eye will judge them to be nearer than they really are, and will bring along with them the other parts of the work, so as to lessen the appearance of the whole. This is clearly exemplified in the figures on the pediment of the west front of St. Paul's cathedral, which, by reason of their gigantic size, are judged to be much nearer the eye than they really are; and thus the

height and magnitude of the building on which they stand are very much diminished. This will be immediately evident to a skilful observer. In the cathedral of St. Peter's at Rome, from which St. Paul's was modelled, there appears the same want of proportion in the statues and ornaments as in St. Paul's, which may be seen by comparing them with a scale of any given dimensions; for the eye always measures the magnitude of an edifice by a scale taken from the parts with which it is most familiarly acquainted, and whose proportions are most generally known, such as human figures, doors, windows, boards, bricks, &c. Some have asserted, that this disproportion between the size of the ornaments and the bulk of the building is a very great excellence. It must, however, be allowed, that the effect of it is to make the building appear much smaller than it really is; and if it be a merit to make the building appear small, it certainly was extreme folly to incur such an immense expence in building it large*. Magnitude and distance being merely comparative, no object or distance can be called great or small but by comparison with some other. Hence it appears, that in very large buildings where each part bears a due proportion to the whole (which is the cause and definition of beauty), nothing can in the general view appear monstrous or out of proportion; and, on the other hand, in small buildings, when the several parts and ornaments are proportionably lessened, the beauty of the whole is still preserved. Thus two pictures of the same subject, although the one is much larger than the other, may yet preserve an equal proportion, and be equally beautiful and agreeable to the eye, and convey alike a true idea of the object represented.

Drawing is the art of representing the appearances of objects by imitation or copying, without the assistance of geometrical rules, and can only be gained by long practice and diligent observation. It has some resemblance to the art of writing, in which the learner is first taught to imitate the shapes of letters, and then to join them into syllables and words; and being possessed of those first rudiments, he attains by practice a freedom and neatness of hand to transpose, combine, vary, and adorn them, according to his fancy. In the same manner a young painter first learns to draw the easiest objects, and thence proceeds to the more difficult; he begins to copy single features from plaster models of the antique, as an eye, an ear, a nose, or a single limb, as a hand or a foot. When perfect in the several parts, he joins them together to complete an entire figure; and when he is master of the general outlines of the whole object, he disposes it in various postures, and then composes groups of figures in various attitudes and characters. An architect pursues the same method with regard to edifices, first learning to draw select parts separately, and thence to compose a perfect building; by this he soon acquires a ready method of drawing every object which presents itself to his view; and after he has provided himself with proper materials†, he is enabled to introduce all that is grand and beautiful into his design. But whatever excellence a painter may attain in the art of drawing, if he has not previously learned the rules of perspective, he will often be at considerable loss. In designing a piece which contains many figures at different distances and with considerable variety of attitudes, he may succeed when he copies from life, and when his drawings are an imitation of nature as he sees it before him, and the different effects of light and shade are exposed

* *Analytical Inquiry into the Principles of Taste.*

† I should particularly recommend young architects always to carry with them a sketch-book, and collect whatever appears picturesque and grand in different edifices; these they may combine in their own designs with great advantage.

to his view, which guides his pencil; but when the original design exists only in his imagination, and he has no unerring guide to follow, he will be likely to fall into great errors and inconsistencies. The effect of the whole will be unnatural and disagreeable, while perhaps he will not be able to discover where the fault lies, or how it may be remedied. The science of perspective will here be highly advantageous, by enabling him readily to discover his error, and teaching him how to correct it; by instructing him in what manner to supply the defects of his work, or retrench its superfluities; to marshal every figure on his canvas, and properly to protract or fore-shorten each; and, finally, by unerring rules, to give to every object its due apparent size, and its appropriate light and shade, according to its supposed situation.

By the science of perspective an architect also is taught to make such a drawing of his design as will appear both just and natural from any given situation, and to decide with certainty what will be the appearance and effect of his building from any station prior to its being erected, as well as if the edifice were really existing in the situation in which his imagination placed it. The knowledge of this cannot be attained without the aid of perspective; although the architect may possess the soundest judgment and the most extensive experience, nevertheless many objects will require a good eye and hand to complete or finish them; for it would be tiresome and endless to apply the rules of perspective to all the minutiæ, as the leafy capitals of columns and the ornaments in the entablatures, the infinite variety of folds in drapery, the boughs and leaves of trees, and the features and limbs of men and animals; much more to give them that roundness, softness, force, and spirit, that expression and grace which are requisite to make a good picture. These will not owe much to perspective, but will be principally indebted for their beauty and value to the taste and judgment of the painter.

Recourse must likewise be had to the painter's art in colouring, for producing his lineal objects a true imitation of nature; but the first importance is to determine rightly the positions and outlines of the several objects on the picture, to make them when coloured produce the desired effect: whence perspective and colouring must afford reciprocal assistance to each other. Instructions on this head, sufficient I hope to enable the young student to undertake any design however arduous, are given at the end of the work. Let him, however, recollect, that as no one can be a complete artist without a thorough knowledge of perspective, so those who are best acquainted with perspective will be extremely deficient, without understanding colouring, composition, and effect. Upon the whole, without skill in drawing a painter cannot do any thing, and without the knowledge of perspective he cannot draw any thing perfectly well. Without perspective a picture is drawn as it were by guess; it has no determinate points, or lines, or any other guide than the judgment of the eye. The forms and situations of the objects are not previously arranged, but left to be proportioned or diversified *ad libitum* in the progress of the work. This indeed is the common way in which some painters proceed, and it leaves them at liberty in their designs, or rather permits them to paint without any settled design at all. If a figure, for instance, appears too large for its distance, it is by a tint of light or shade brought forward by making that part of the ground on which it stands appear nearer; mountains are removed from place to place by raising or lowering their foundations, until at last they fix them as suits best the strength and tone of colour which they first gave them. As they have no fixed design by which to work, they can only make their eye the judge, and by it en-

deavour to correct what appears to be out of place; but frequently they only render the defect more glaring, and are compelled, after repeatedly unsuccessful trials, to throw that part into shade in order to keep it down, or to blot it quite out and substitute something in its stead. As they are frequently not sure of the correctness of what they intend, they are obliged to keep others as much in the dark as themselves, by studiously avoiding all regular figures and straight lines, and leaving the boundaries of their shadows quite vague and uncertain. Thus at length the piece is finished, and such painters are almost as ignorant of the true original of their performance as the greatest stranger; and if no obvious or gross faults appear in it, they are much more indebted to chance, than to the rules of the art which they profess. . . . . .

A great deficiency in the knowledge of perspective is frequently to be observed in historical compositions, which is much to be lamented in works of so high a class. Many painters avoid those architectural accompaniments which the subject demands, but which would discover their ignorance of perspective if introduced. They substitute a confused landscape or troubled sky; and sometimes the piece is filled up with an enormous curtain, placed in a situation where none but a mere painter would ever place it. Sometimes the scene is represented in a garden, that the difficulties of architecture and perspective may be avoided, when the transaction is well known to have taken place in a court or palace. A painter who is really acquainted with perspective, and has drawn his picture by its perfect rules, may transform it in any way he pleases; for nothing in his performance is ambiguous or uncertain, but what would appear so in nature. The true distance and original height and breadth of his figures being recollected, the same transaction may be represented as seen from another point of view; the subject still remaining the same, while infinite variety is given to the effect. The painter who works by the unerring law of perspective is in no danger of falling into absurdities; nor does he stand in need of those pitiful subterfuges which have been just mentioned, to cover his ignorance of the science. If any part of his drawing has not a good effect, he knows where and how to correct it, and has the pleasure of proceeding with certainty towards the accomplishment of his purpose, without the toil and anxiety of feeling out every step of his road, and not knowing in the end whether he is right or wrong, "like the blind groping their way, and uncertain of their path."

ERRATA.

Page 1, line 20, for *walls* read *walk.*
—— 31, — 23, for *hither* read *hithermost.*
—— 37, — 11, for *four columns* read *eight columns.*
—— 48, — 11, for *staircase* read *stone steps.*
—— *ib.* — 25, for *heavy* read *leafy.*

CONTENTS.

PRELIMINARY OBSERVATIONS, &c.

THE DIFFERENT KINDS OF PERSPECTIVE DEFINED,

ALL OF WHICH ARE PERFORMED BY THE SAME UNIVERSAL RULES.

LINEAL PERSPECTIVE is the representation of objects in outline, or lines bounding and terminating the parts which compose an object without light or shadow; and is divided into rectilineal and curvilineal.

ANGULAR PERSPECTIVE is, when the horizontal lines of the front and end of a building both converge to vanishing points, terminating in the horizon; and is then called angular or oblique perspective.

PARALLEL PERSPECTIVE is, when one front of a building or object represents a kind of geometricial elevation, having all its horizontal lines parallel, the end converging to a vanishing point in the horizon.

BIRD'S EYE or ELEVATED PERSPECTIVE is of two kinds, angular and parallel, and is used in drawing large extensive buildings, having spacious courts and promenades; as palaces, colleges, asylums, &c. The observer is supposed to be on an eminence, and looking down as from a steeple or mountain.

HORIZONTAL PERSPECTIVE is the representation of objects on a horizontal ceiling, the spectator standing on the floor below. If the observer were to lie with his back on the floor, and the ceiling and floor were conceived to be turned perpendicularly with the wall opposite, his feet answering to the ground plane, it would then be seen to be according to the same rules as parallel perspective. The ceiling of Whitehall Chapel is the finest specimen of this kind, painted by Sir Peter Paul Rubens.

PANORAMIC PERSPECTIVE is the representation of objects upon the inside of the walls of a rotundo, or circular building, the spectator moving round the centre of the same. If the walls were transparent as glass, and gummed over so as not to make them impervious to the sight, the objects seen through this medium would then, if traced on the surface with a pencil, represent, by their rays piercing through the glass, a panoramic view.

SPHERIC PERSPECTIVE is the representation of objects on the inside surface of a dome, as panoramic is on the inside of a cylinder, to which it has an analogy. The dome of St. Paul's is a very fine specimen of this kind of perspective, painted by Sir James Thornhill. The eye is considered as in the centre below, moving round a point or axis.

INCLINED PERSPECTIVE is the same rules applied to inclined planes, or pictures, painted to be placed in an inclined position.

THEATRICAL PERSPECTIVE is the application of perspective to the detached scenery of a theatre.

MILITARY PERSPECTIVE is a medley kind, used in drawing fortifications, or ramparts; it is partly geometrical and partly stereographical.

NAVAL PERSPECTIVE is nothing more than the application of perspective to a ship, the most beautiful to which it can be applied.

CATOPTRIC PERSPECTIVE is the representation of objects as seen by reflection on polished planes; as steel, water, mirrors, &c.

SCIAGRAPHIC PERSPECTIVE is the art of projecting shadows of objects from a luminous body; as the sun, a torch, candle, &c.

INVERSE PERSPECTIVE is the art of returning objects perspectively drawn, back to their original figure. It is chiefly of use when we find, by the disproportion of the parts, that we have proceeded wrong, and cannot see where the mistake lies, owing to the imperfection of sight: so by an inverse operation we can prove the truth, or detect the error, without going over the whole process again.

AERIAL PERSPECTIVE is the gradation of light and shade on various objects as they recede from the eye; for instance, a house a mile distant would be fainter in light and shade than one a quarter of a mile distant, and so in proportion, until the parts are become imperceptible.

ANAMORPHOSIS is a violent distortion in perspective, from too near a point of view, and from the injudicious attitude or situation of the object; but is perfectly true according to the laws of perspective, although the young draughtsman must carefully avoid it.

DEFINITIONS OF TERMS USED IN PERSPECTIVE,

INCLUDING THE DIFFERENT KINDS OF PROJECTION.

Projection is the delineation of objects transcribed on a plane surface according to certain principles: it is either ichnographic, orthographic, or scenographic; but when on a globe representing the celestial or terrestrial bodies, it is then spheric. These projections are made by a system of rays, or right lines, drawn from all the visible angles of the objects parallel to each other, or to the eye of a spectator; and where they are intercepted by a plane, there will be the points to delineate the figures that are lying beyond, and adjacent to, the intervening plane: the objects beyond are the originals, and the delineation on the plane is their image. If the objects are situated between the plane of projection and the observer, the diverging rays are then produced to that plane, which is then called a transprojection of the objects to the picture: if the rays converge from a circle or spheric body, terminating in a point at the eye, it is then called a cone of rays, the eye being the apex of that cone; but if the converging rays proceed from a square or cubic object, it is then called a pyramid of rays: the whole taken together is called an optic pyramid.

Ichnography is, when a system of parallel rays is drawn from every angle of the object to the ground plane; or, which is the same thing, it is a section of the rays made by a plane parallel to the horizon.

Orthography signifies the upright delineation of an object or front: it is obtained by a system of rays drawn from the object, parallel amongst themselves and to a vertical plane; and were the points of contact joined by lines, would represent the image of the object, or orthographic projection, commonly called an elevation.

Scenography is a perspective projection made on any surface, either curved or plane, by a cone or pyramid of rays projected or transprojected to the plane of delineation. It is, however, impossible to lay down rules for the distance; yet, I grant, that a moderate one is at all times best, since too near a view of the object causes distortion, and a very distant one often renders the perspective too tame: but the projection is scenographic, let the eye be far or near; and, whether the delineation be a surface or a solid, it is the same. This is the most pleasing of all projections, as it conveys a lively idea of all sorts of objects either in art or nature: and it is of great importance in drawing and representing designs of every kind, as edifices, sculpture, and historical subjects; or delineating the beauties of nature, as rivers, mountains, woods, animals, or whatever appears before us; and this it does in a manner the most pleasing to appearance of any sort of projection whatever: it is from hence painting, sculpture, and all the fine arts derive much of their beauty and splendour.

Seat is the space that an object would occupy on the ground plane.

Plan is the horizontal section of a building divided into compartments.

Plane is a perfect, even, regular surface, which is neither concave nor convex in any part, but agrees with the straight edge of a ruler applied any where to the surface.

Ground Plane is the ground itself, and, for convenience, is considered perfectly level: the objects to be drawn are placed on it, whereon also stand the observer and plane for delineation.

Plane of Projection is the paper or canvas stretched on a frame or board, making a plane surface: it may be supposed standing perpendicular to the ground plane, between the object

and the observer. Were lines drawn from the angles of the objects through the paper to the eye in right-line directions, the place where they pierce through the paper would be terminating points for the perspective representation: this is performed by rules, the original objects being given, which is the practice of perspective. Plane of delineation, plane of the picture, and transparent plane, are all synonymous terms.

Line of Projection is the line on which the plane of delineation is situated, or where the distance of the vertical lines are taken from, and transferred to the paper on which the picture is to be drawn; which is performed by rules on the paper lying horizontally, generating the same figure as would be obtained if the paper were placed perpendicularly on the line of projection and intersected by the optic rays.

Original Object is any object whatever, or the subject we are about to delineate.

Original Plane is any plane we are about to draw, whether planes on which the objects are situated, or plane surfaces of the original objects themselves.

Original Line is any line of an original object.

Intersecting Line is a line drawn from the seat of an original object to the line of projection, and generally parallel to one of the sides of the seat; but it may be drawn in any direction not tending to the eye of the spectator, as in that case it would be called a visual ray.

Intersecting Plane is a plane standing on an intersecting line: it is one of the most essential planes in perspective; therefore ought to be well understood, as it may be applied in every case, whether vertical or inclined.

Vertical Line is a line standing perpendicular to the horizontal line.

Vertical Plane is a plane standing erect on the ground plane.

Dividing Point is a proportional point obtained in the horizontal line, for dividing and proportioning the figures on a plane; and is calculated to facilitate the practice of perspective where parts are very tedious, as dentals, triglyphs, balusters, battlements, &c.

Principal Angle is the angle contiguous to the line of projection.

Horizon, or *Horizontal Line*, in perspective, is a line infinitely extended, drawn on the picture parallel to the line of projection, or ground line, the height of the eye of the spectator, whether elevated or depressed; and is supposed to be obtained by a horizontal plane passing before and from the observer's eye to the plane of the picture, or plane of delineation.

Point of View, or *Point of Sight*, is the station point, or fixed place of the eye of the observer viewing the object or objects to be drawn, and where the eye of the spectator ought always to be placed to look at a picture, for in no other point of view can a perspective picture be seen to advantage.

Visual Rays, in optics, signify imaginary rays of light, by which vision is supposed to be conveyed from the object to the eye of the spectator: in perspective, they are straight lines, imagined to be drawn from the eye to the object which it has in view.

Centre of the Picture is a point in the picture perpendicularly opposite the eye of the observer, or point of view, and is always somewhere in the horizontal line.

Distance of the Picture is the distance of the centre line from the plane of delineation, or line of projection to the station point.

Vanishing Point is that point in the picture to which lines converge, and which are the perspective representation of parallel lines in the original objects inclined to the plane of projection.

THE THEORY OF LINES AND PLANES.

PLANES, or lines parallel to the plane of delineation, have no vanishing points; but in such case the perspective representation of all objects so situated is similar to the originals.

Original planes or lines, however inclined to the plane of delineation, vanish in that point where a parallel line drawn from the eye would come in contact with the picture.

All original planes, or lines which are parallel to each other, but not to the plane of delineation, have the same common vanishing point.

The perspective representation of a straight line is a straight line in every position whatsoever.

The perspective projection of any number of lines that are parallel amongst themselves and to the plane of projection, are also parallel to each other.

Lines which are truly and strictly parallel in the geometrical original, will appear not to be parallel in the perspective, if oblique to the plane of delineation.

Parallel lines, at right angles to the plane of delineation, if indefinitely produced, will appear to the eye to meet in a point; because the optic angle subtended by the interval or distance between them at that indefinite prolongation, will become invisible.

If a line be parallel to the line of projection, its perspective representation on the plane of delineation will be parallel to the ground line also.

The perspective representation of all lines perpendicular to the ground plane, will, if projected to the plane of delineation, be perpendicular to the ground line.

The centre of the picture is the vanishing point of all lines perpendicular to the plane of delineation, or at right angles to the line of projection.

The centre of the picture is always where a perpendicular from the plane would project and touch the eye, or a line drawn from the eye, making a right angle with the plane of delineation, however situated.

The line drawn from the eye of a spectator to the plane of projection, producing a vanishing point, is parallel to the plane of the object for which it is a vanishing point.

Visual rays of all visible objects are radii of a sphere converging to the spectator, whose vertical gravity tends to the centre of the earth; and hence they are sometimes called radial lines.

Original objects in planes, which are parallel to the plane of delineation, have their representations similar to the originals, whether squares or circles; and hence all parallel sections produce similar figures.

The perspective representation of a circle on a vertical plane oblique to the plane of delineation, is an ellipsis, except in one certain point of view, in which its representation is likewise a circle.

Every circle appears an ellipsis, except when the axis of the eye is perpendicular to the plane of the circle and passes through its centre: for in that case only, the visual rays from the eye to every point in the circumference are equal; and, consequently, they generate a right cone: the axis of the eye being in the axis of the cone in every other position, the rays must form a scalene cone.

The perspective representation of a sphere or globe on a plane is an ellipsis, except when the centre of the picture coincides, or is in the centre of the sphere, and in that case only it is a circle.

All globes placed in a horizontal line parallel to the plane of delineation will be of an equal height, and however they are removed from the eye, whether above, below, or sideways, if equal each way from the centre, they will all be similar: the farther they are from the centre the more eccentric will be the ellipsis.

A spheric body always forms a right cone of rays with the eye, and the spheroidal contour is generated by the plane of delineation cutting the rays obliquely.

A circle always presents its shortest diameter to the eye in a direct line, unless the eye be perpendicularly opposite the centre, it being the section of a scalene cone. A globe, or dome, always shews its longest diameter in the said direction, if the rays are cut obliquely, it being the section of an equilateral cone.

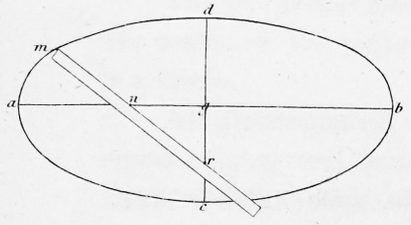
All conical sections, whether a right cone or an oblique cone, are no more than the perspective representations of the circular line of the base upon the plane of delineation, in various positions, seen by the eye at the vertex of the cone.

If a circle be described on the ground plane, and the plane of delineation be placed perpendicular without the circle, and a perspective projection of the circle were made on the plane of delineation, the plane being between the observer and the original circle, its representation would be an ellipsis; if the plane did not cut the rays subcontrary, in which case it would be also a circle.

If the plane of delineation were placed on the semidiameter of the circle perpendicular to the ground plane, the spectator standing on the line of the circle direct to the plane of delineation, and if the portion of the circle lying beyond the plane were perspectively projected on the plane of delineation, the image represented thereon would be a parabola.

If the plane of delineation were placed on the semidiameter of the circle perpendicular to the ground plane, as before stated, and the spectator were to approach within the circle, and a perspective projection of the circle lying beyond the plane were delineated on that plane, its image would then be a hyperbola.

PLATE 1.



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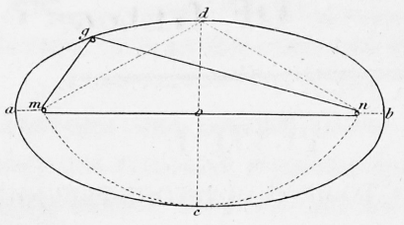

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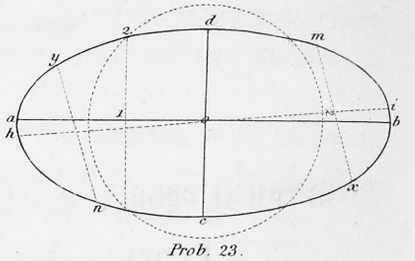

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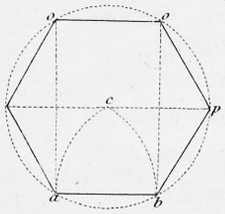

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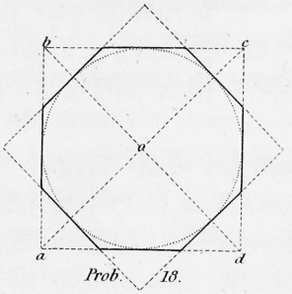

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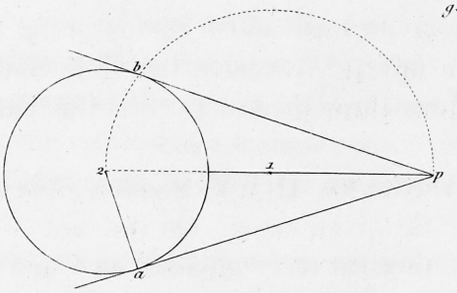

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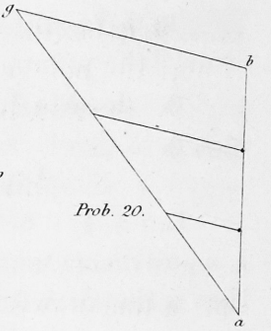

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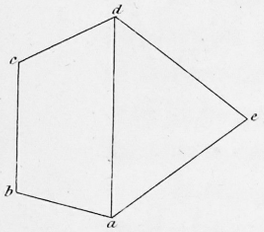

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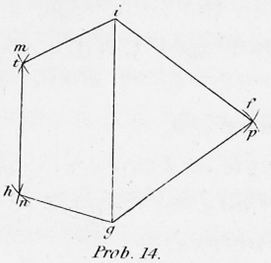

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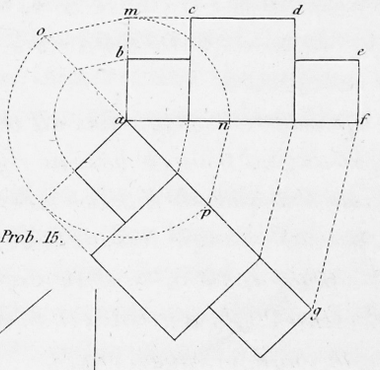

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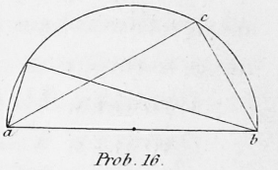

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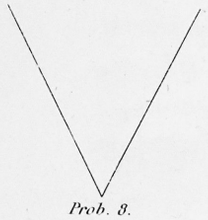

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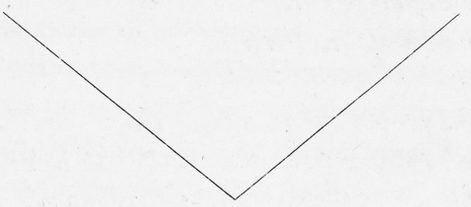

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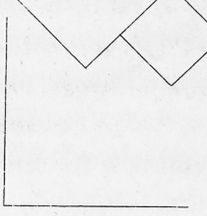

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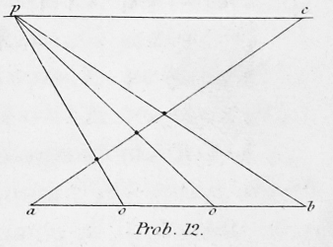

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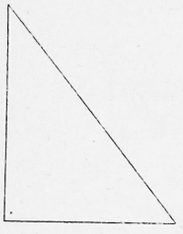

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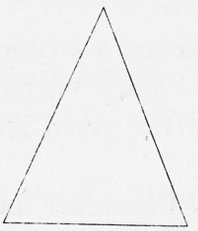

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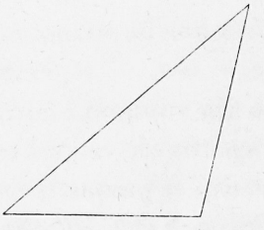

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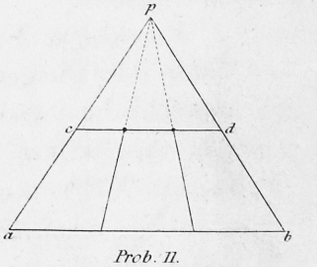

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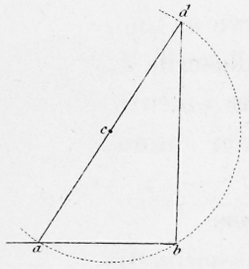

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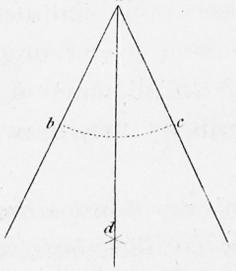

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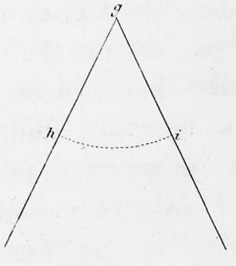

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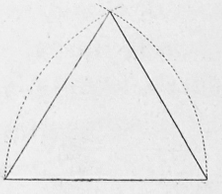

Prob. 4.

R. Brown del.

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T. L. Busby sculp.

ELEMENTS OF GEOMETRY.

PLATE I.

GEOMETRICAL PROBLEMS NECESSARY TO BE UNDERSTOOD PREVIOUS TO LEARNING PERSPECTIVE.

PROBLEM I.—*To erect a perpendicular upon the end of a given line.*

LET *a*, *b* be the given line, and *b* the point on which the perpendicular is to be drawn: assume the point *c* any where above the line, and with the distance *c*, *b* describe the curve *a*, *b*, *d*; draw a line through *a*, *c* to cut the curve above, then will *d*, *b* be perpendicular to *a*, *b*.

PROBLEM II.—*To divide a given angle into two equal angles.*

Let *a*, *b*, *c* be the given angle: set the foot of the compasses at *a*, and describe the curve *b*, *c* any distance; then set the compasses on *b*, and describe the curve *d* any distance, also *c*, *d*; then a line drawn from *a* to *d*, the intersection, will divide the angle required.

PROBLEM III.—*To transfer the angle a, b, c, fig. 2. or any other given angle.*

Let *g*, *h* be a given line: take the distance *a*, *b*, fig. 2. in the compasses, set one foot on *g*, and describe the curve *h*, *i*; then, with the distance *b*, *c*, fig. 2. mark the distance *h*, *i*; draw the line *g*, *i*, then is the angle completed.

PROBLEM IV.—*An equilateral triangle has all three sides equal.*

PROBLEM V.—*A right-angled triangle has one right angle and two acute ones.*

PROBLEM VI.—*An isosceles triangle has two sides equal and one unequal.*

PROBLEM VII.—*A scalene triangle has all three sides unequal.*

PROBLEM VIII.—*An acute angle is less than a square angle.*

PROBLEM IX.—*An obtuse angle is greater than a square angle.*

PROBLEM X.—*A right angle or square angle.*

PROBLEM XI.—*To divide a line in geometrical proportion to a line given.*

Let *a*, *b* be the given line, and *c*, *d* the line to be divided, drawn parallel to *a*, *b*: divide the line *a*, *b* into the number of parts intended; take the point *p* any where above the centre *a*, *b*; draw *b*, *p*, *a*, *p*; and the intermediate lines drawn to *p* will divide the line *c*, *d* into the proportion required.

PROBLEM XII.—*To divide a line in perspective proportion to a geometrical line.*

Let *a*, *b* be the geometrical line, and *a*, *c* the perspective one: draw the line *p*, *c* parallel to *a*, *b*, and let *p* be a dividing point in the supposed horizon; draw the given intermediate lines *o*, *o* to *p*, then will *a* . . . be the perspective divisions required.

PROBLEM XIII. *is a given geometrical or perspective object; and* PROBLEM XIV. *is the same transferred or copied from* XIII. *shewing how the same is to be done.*

Let *a*, *b*, *c*, *d*, *e* be the given object: take *a*, *d* and set it upon *g*, *i*; then take *a b* in the compasses with the pencil leg, set the foot of the compasses on *g*, and describe the curve *h*; then take *d*, *b*, and on *i* as a centre, describe the curve *n*; take *a*, *c*, and on *g* as a centre, describe *t*; take *d*, *c*, and from *i* describe the curve *m*; then take the distance *d*, *e*, and on *i* as a centre, describe the curve *f*; lastly, take *a*, *e*, and on *g* describe *p*; then draw *g*, *i* to the intersections, which will give the form of the annexed figure.

PROBLEM XV.—*To enlarge or diminish a drawing in proportion to a given one.*

Let *a*, *b*, *c*, *d*, *e*, *f* be the given drawing: set the foot of the compasses on *a*, and describe the curve *m*, *n*; draw the line *o*, *a*, *g* parallel to *m*, *n*; make *a*, *g* the length of the required drawing;

then join *f*, *g*, and draw the intermediate lines parallel, which will give their enlarged widths for the heights; set the compasses on *a*, and describe the curve *p*, *o*; then join *m*, *o*, and draw the intermediate lines parallel to *m*, *o*; circle them round *a*, and draw them parallel to *a*, *g*, which will give the heights proportioned to the widths.

PROBLEM XVI.—*If a semicircle is drawn, and a point taken any where in the curve, and if lines are drawn from that point to* a *and* b, *the angle will always be a right one.*

Let *a*, *b*, *c* be the semicircle: draw its diameter *a*, *b*; join *c*, *b*, *a*, and the angle at *c* will be a right one: the other is the same.

PROBLEM XVII.—*To describe an hexagon, one side being given.*

Let *a*, *b* be the given side: set the foot of the compasses on *a*, and describe the curve *b*, *c*; then set the foot on *b*, and describe *a*, *c*; then set the foot on *c*, and describe the circle *b*, *a*, *o*, *o*; draw *b*, *o*, *a*, *o* perpendicular to *a*, *b*, to cut the circle above; and *c*, *p* parallel to *a*, *b* will give the points to draw the sides of the hexagon.

PROBLEM XVIII.—*To draw an octagon to any given dimensions.*

Let *a*, *b*, *c*, *d* be the given diameters of the octagon: draw the diagonals *a*, *c*, and *b*, *d* will give the centre *o*; on *o* as a centre describe the circle to touch the square *a*, *b*, *c*, *d*; draw lines to touch the circle parallel to the diagonals *a*, *c*, *b*, *d*, which will give the octagon required

PROBLEM XIX.—*A circle being given, and two lines drawn from* p *to touch it, to find the point of contact.*

Let *a*, *b* be the circle, *p* the point, and *p*, *a*, *b* the lines drawn: produce a line from *p* to the centre 2; find the midway, as 1; then on 1, with the radius 1, *p*, or 1, 2, describe the arc 2, *b*, *p*; and where the curve passes through *b* will be the point of contact, which is at *b*. Or thus, draw a line at right angles to *a*, *p*, to touch the centre of the circle, which will give it also.

PROBLEM XX.—*To divide a line proportional to a given line.*

Let *a*, *b* be the line to be divided: draw the line *a*, *g* in any direction from *a*; set the original distances on the given line *a*, *g*; draw the line *b*, *g*, and the others parallel, which will give the proportion required.

PROBLEM XXI.—*To draw an ellipsis with a slip of paper to any length and breadth given.*

Let *a*, *b* be the longer, and *c*, *d* the shorter diameter, through which it is required to describe the ellipsis: take a slip of paper, any thing longer than half the longest diameter; take the length of *d*, *g*, and mark from *m*, *n* on the slip of paper; then take *b*, *g*, and mark from *m* to *r*; then, by moving the paper, keeping *n* on the line *a*, *b*, and *r* on the line *c*, *d*, at the same time marking points at *m*, will give points through which the curve is to be drawn.

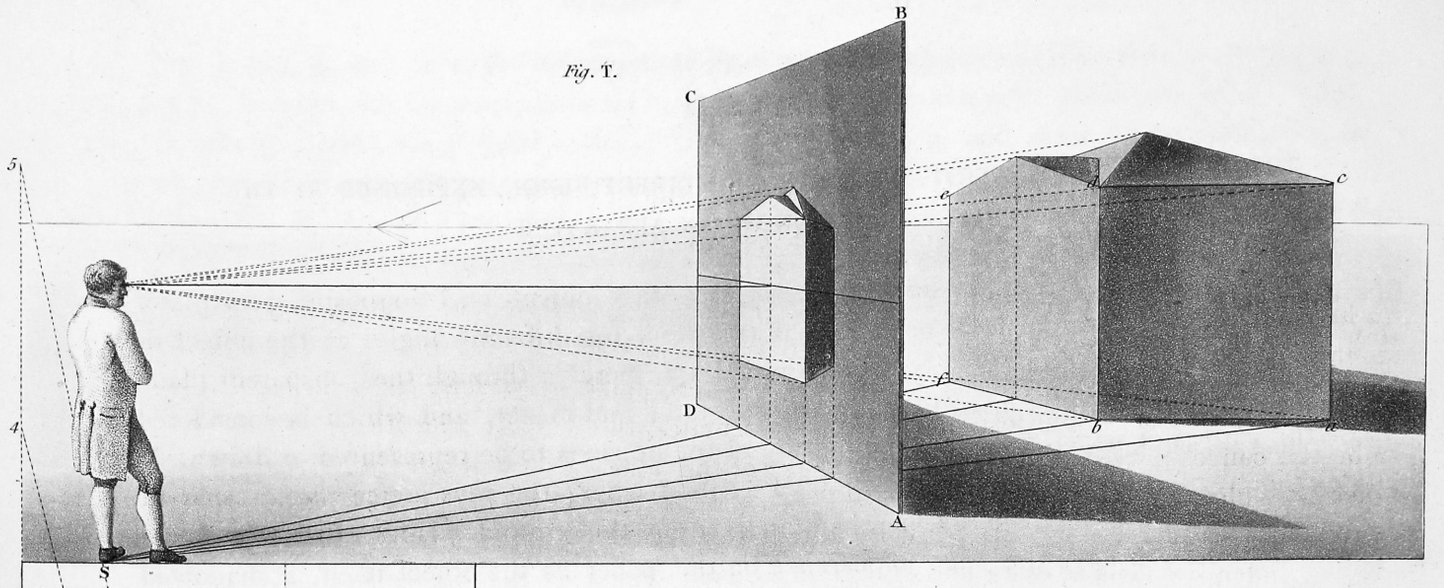
PROBLEM XXII.—*To describe an ellipsis with a string to any length and breadth.*

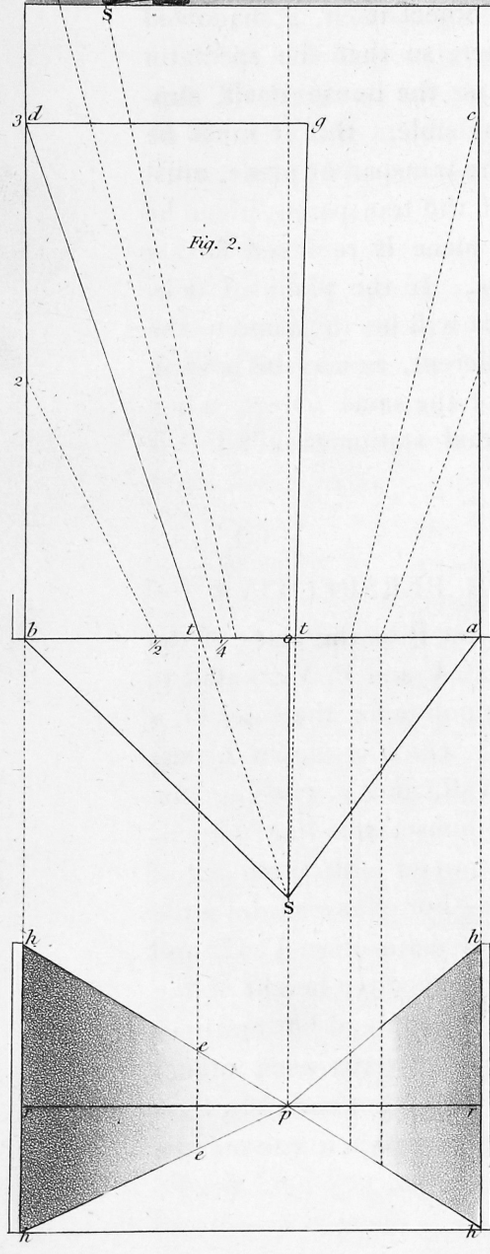
Let *a*, *b* be the major, and *c*, *d* the minor diameters, at right angles to each other: take *o*, *a* in the compasses, set one foot at *d*, and describe the dotted curve *m*, *n*; then, if pins be placed at *m*, *n*, and a thread tied round *d*, *m*, *n*, and a pencil put inside the string at *d*, and moved round as *g*, it will describe the ellipsis.

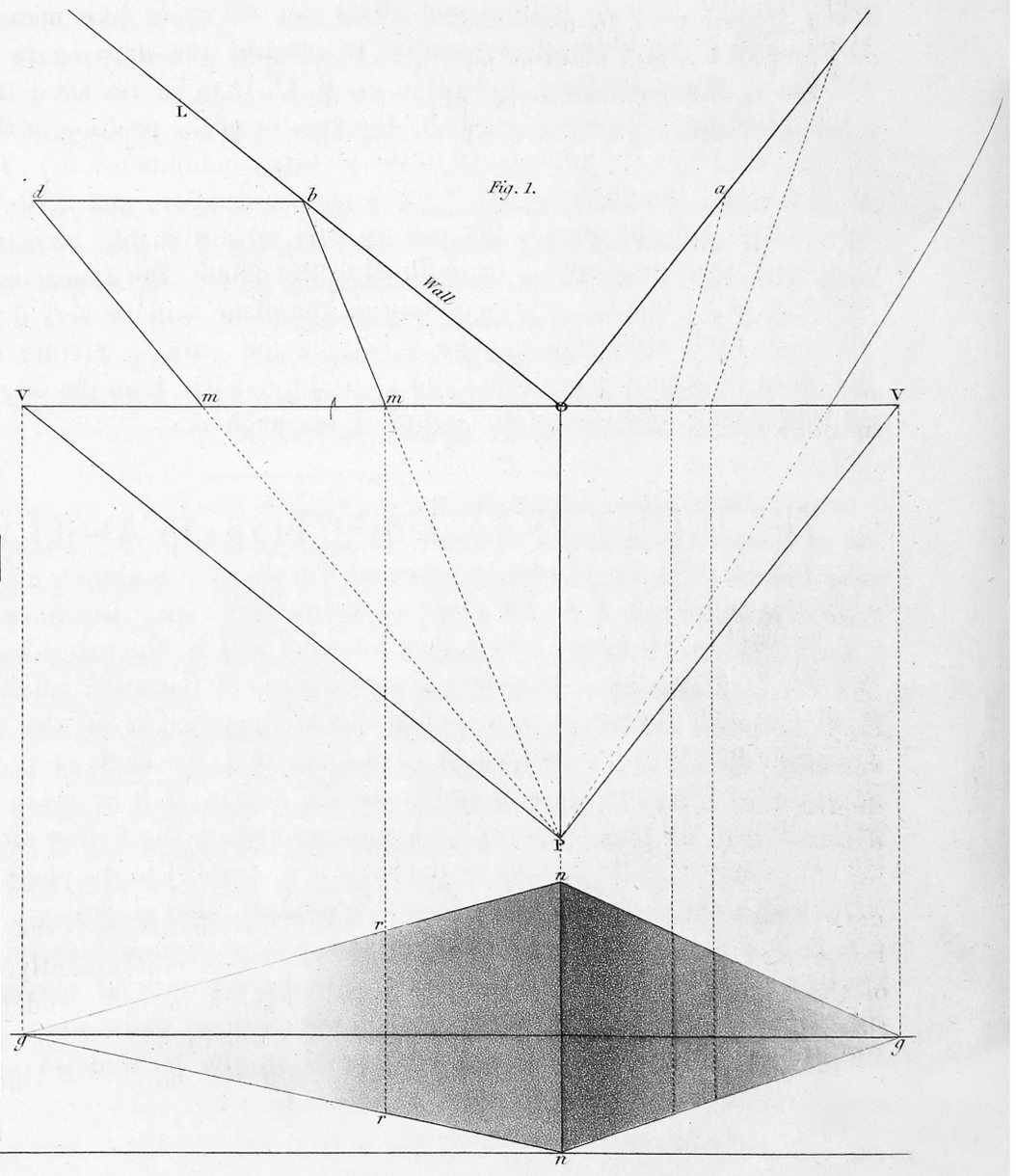
PROBLEM XXIII.—*An ellipsis being given, to find the longer and shorter diameters.*

Let *a*, *b*, *c*, *d* be the ellipsis: draw the line *x*, *m* in any direction, and the line *n*, *y* parallel to it; find the centre of the lines *x*, *m*, *n*, *y*, and draw the dotted line *h*, *i* through them; find the centre of the dotted line *h*, *i*, which will be the centre of the ellipsis; from the centre *o* describe a circle any size within the length of the ellipsis; draw the dotted line where the circle cuts the ellipsis, and find its centre; then a line drawn through *i*, *o* will be the longest diameter, and a line drawn through *o*, its centre at right angles, will be the shortest diameter, or axis.

PLATE 2.







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London, Printed for Samuel Leigh, 18 Strand, May 2nd 1811.

T. L. Busby sculp.

PLATE II.

THE THEORY OF PERSPECTIVE, RELATIVE TO DIRECT VISION, EXPLAINED BY THE REPRESENTATION OF AN APPARATUS.

LET *a*, *b*, *c*, *d*, *e*, *f*, Fig. T. be a house, or any other object, and supposing a spectator to be standing at S; and let lines or rays be drawn from the different angles of the object in contemplation to the eye of the spectator standing at S, piercing through the transparent plane A, B, C, D, which is interposed between the spectator and object, and which is considered to be the canvas or paper on which the picture of the house is to be represented or drawn. It must be evident, that if the points are joined by lines where the rays pierce the transparent plane (and which is obtained by perpendiculars from the ground plane), that the figure formed thereon will have the same appearance on the paper as the object itself, if shadowed and coloured true to nature, and affect the senses in like manner; so that the spectator standing at S would be so deceived as to imagine the drawing to be the house itself, supposing the other parts of the plane A, B, C, D to be rendered invisible. But it must be evident, that every change made by the eye, or of the position of the transparent plane, must change the view, the appearance of the picture, and dimensions. If the transparent plane be placed nearer the observer, the picture will be smaller; and if the plane is removed farther off, or nearer to the object, the picture will proportionably increase. If the plane of delineation is placed obliquely, or inclined to the object, the appearance will be the same to the observer at S; but the representation on the plane will be very different, as may be proved, although each alike will convey a correct and striking picture of the same object, when placed in their proper position, and viewed by an eye from the original station point: this is an ocular demonstration of the nature of perspective.

THE THEORY OF VANISHING LINES IN ANGULAR PERSPECTIVE.

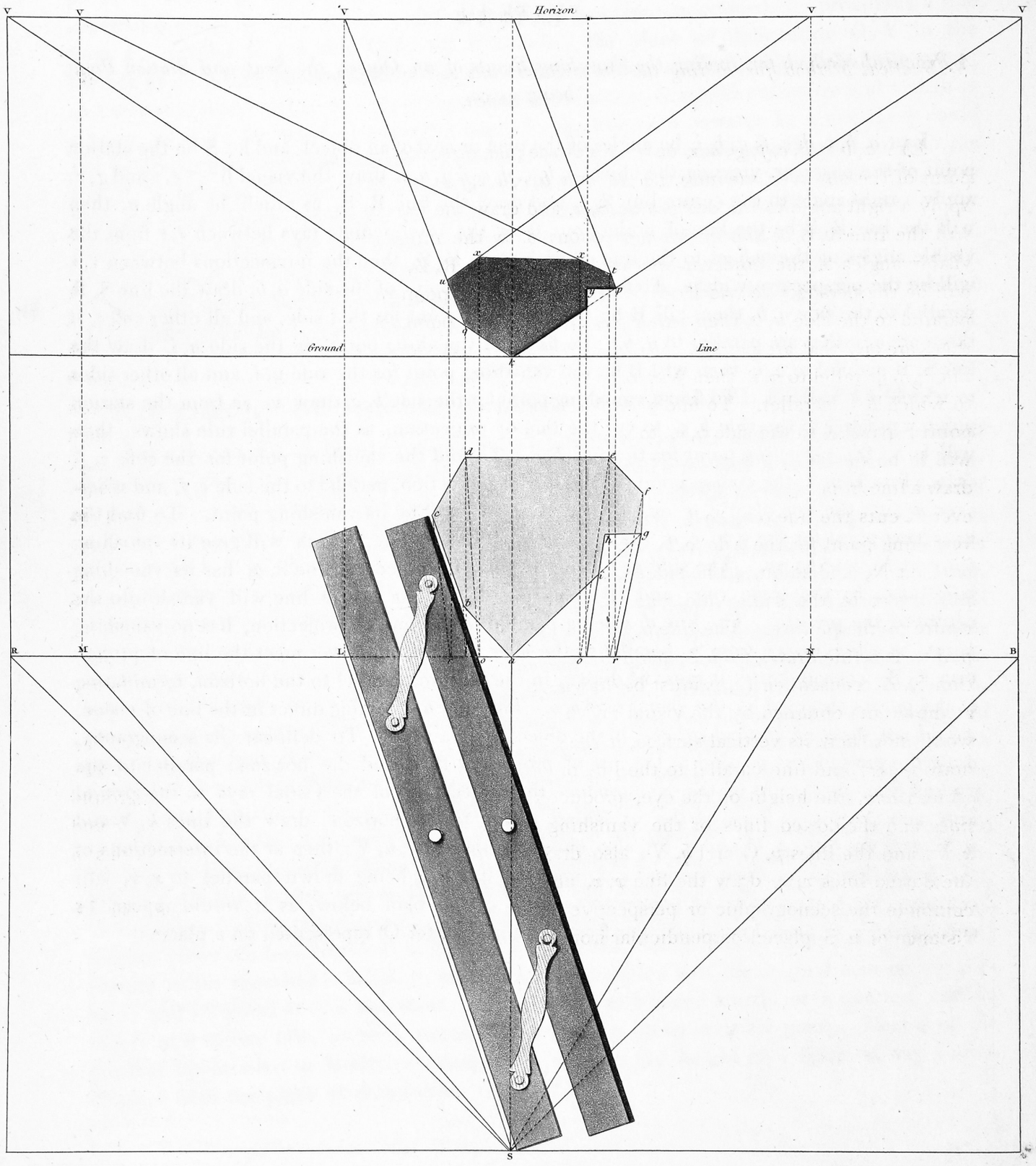
Let O, *a*, *b*, Fig. 1. be two extended walls of a building, and let P be the place of the observer, and V, O, V be the plane of delineation: draw the lines P, V and P, V parallel to the walls O, *a*, O, *b*, and where they intersect will be the vanishing points for the sides O, *a* and O, *b*: draw the perspective representation of the walls below, which is shown by the diagram; then the angle *n*, *n*, being the original height of the wall, and *g*, *g* being the vanishing points in the horizon, it is obvious that the angle of the house, standing perpendicular over the point O, will appear its real height, as it comes in contact with the plane of delineation; and that the line over *b* will diminish, being farther off:—For example, draw the line *b*, *d*, which is the height of the angle *n*, *n*, parallel to the plane of delineation V, O, and draw *d* to P, the station point; then it is evident, that *m*, *m* is the perspective height of the line *b*, *d*, and which agrees with the line *r*, *r* below; consequently, the top and bottom lines of the building will appear inclined and to have a mutual tendency towards each other: they must therefore be so represented on the plane of delineation. The point wherein they would meet, if produced, would be a point in the horizontal line perpendicular over the

point V, the height of the observer's eye, and which is expressed by the point *g* in the annexed diagram below; which point is obtained, as before-mentioned, by producing a line from P, parallel to the side O, *b*, till it touches the plane of delineation O, V in the horizon at *g*; which point would be the place of their union, and comprehends infinite space; and were the whole plane, *n*, *r*, *n*, *r*, continued on infinitely, it would concentre and vanish in a point, as at *g*: for, however extended might be the line O, *b* towards L, a visual ray could not be drawn from any point of the extended line O, L that could possibly fall in with the line P, V, because the line P, V is parallel to the line O, L; therefore the space from O to V is the representative space on the plane of delineation for the infinite extension of the plane over the line O, L. But however trifling might be the variation of a visual ray, as P, *d*, from the line P, V, were P, *d* produced, it would somewhere meet the extended line O, L; which could not be the case with producing the line P, V, because it is parallel to the line O, L, and parallel lines, though infinitely extended, can never meet.

THE THEORY OF VANISHING LINES IN PARALLEL PERSPECTIVE.

Let *a*, *b*, *c*, *d*, Fig. 2. be two parallel walls infinitely extended; and let *a*, *b* be the plane of delineation, and S the station point of the observer: produce the line S to the plane of delineation *a*, *b*, at right angles, then will S, O be the centre line of the picture: produce the lines *a*, O, *b* to *r*, *p*, *r*, the horizon in the figure below, and if lines be drawn from the top and bottom of the walls *h*, *h*, &c. to *p* in the horizon, it will give the perspective representation of the walls *a*, *c*, *b*, *d*, which converges to the point *p*, although they are perfectly parallel to each other. This will appear on investigation:—For example, let lines be drawn from 2, 3, 4, and 5, towards the point S; we shall then find the walls to appear constantly approaching each other towards the point or centre O, which, if produced to the diagram below, will give their respective inclinations and heights, as is seen by the dotted lines *e*, *e*, &c.; although the lines 2, 3, 4, and 5, would infinitely approach the centre O if continued, yet they can never pass it if carried on *ad infinitum*: and from this it follows, that all lines parallel to each other must meet in a line drawn parallel to themselves from the eye of the spectator to the plane of delineation. If a line be drawn from 3 parallel to the plane of delineation, and the original height of the wall, as *h*, *h*, is marked on the line 3, *g*, which is drawn parallel to the plane of delineation, and produced towards the station point S, then the distance obtained at *t*, *t* will be found to correspond to the height *e*, *e* below, which proves the declivity of the lines *h*, *p*, *h*, *p*. There is also a very valuable principle in this diagram, applicable to proportioning human figures in a landscape or interior views of a building:—For example, a figure at 2, which is as far behind the plane of the picture as the spectator is before it, makes its representation half the original size on the picture; and an object at 3 is one third, and an object at 4 is one fourth, or a quarter, and an object at 5 is one fifth, at 20 a twentieth, and so on to an invisible point. This is of the greatest importance in landscape painting, as it gives the height of a figure at any known distance from the plane of delineation.

PLATE 3.



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London, Printed for Samuel Leigh, 18, Strand, May 1, 1814.

T. L. Busby sculp.

PLATE III.

A Practical Method for finding the Vanishing Points of an Object, the Seat and Station Point being given.

LET *a*, *b*, *c*, *d*, *e*, *f*, *g*, *h*, *i*, be angles of the plan or seat of an object, and let S be the station point of the observer, viewing the object *a*, *b*, *c*, *d*, *e*, *f*, *g*, *h*, *i*: draw the visual lines *c*, *r* and *g*, *r*; apply a right angle to the centre line S, *a*, and draw the line R, B, to touch the angle *a*, then will the line R, B be the line of projection: draw the intermediate rays between *r*, *r* from the visible angles of the object to the line of projection R, B, then the intersections between *r*, *r* will be the perspective widths. To find the vanishing point of the side *a*, *b*, draw the line S, R parallel to the side *a*, *b*, then will R be the vanishing point for that side, and all other sides, if there are any that are parallel to *a*, *b*. To find the vanishing point for the side *a*, *i*, draw the line S, B parallel to *a*, *i*, then will B be the vanishing point for the side *a*, *i*, and all other sides to which it is parallel. To find a vanishing point for the side *b*, *c*, draw a line from the station point S parallel to the side *b*, *c*, to cut the line of projection, as the parallel rule shows, then will L be the vanishing point for the side *b*, *c*. To find the vanishing point for the side *e*, *f*, draw a line from S, the station point, to the line of projection, parallel to the side *e*, *f*, and wherever it cuts the line of projection, as it will at M, will be its vanishing point. To find the vanishing point for the side *c*, *d*, draw a line from S, as before, which will give its vanishing point at N, and so on. The side *g*, *f* being parallel to the centre line S, *a*, has its vanishing point at *a*, by the same rule, and all lines parallel to the centre line will vanish into the centre of the picture. The line *d*, *e* being parallel to the line of projection, has no vanishing point, as a line drawn from S, parallel to the side *d*, *e*, would never meet the line of projection R, B; consequently, it must be drawn, in the picture, parallel to the horizon, terminating at the points obtained by the visual rays *o*, *o*. The side *h*, *i* coming direct in the line of vision, would not shew its vertical surface, if the object were a solid. To delineate its scenography, draw the ground line parallel to the line of projection R, B and the horizon; parallel to the ground line, the height of the eye, produce the dotted lines of the visual rays to the ground line, and the dotted lines of the vanishing points to the horizon; draw the lines *k*, V and *k*, V, and the lines *p*, O and *q*, V; also draw the lines *t*, V, *u*, V; then at the intersections of the dotted lines *x*, *x*, draw the line *x*, *x*, and the line *p*, *y* being drawn parallel to *x*, *x*, will complete the scenographic or perspective figure of the plan below, as it would appear the distance of *a*, S placed perpendicular from the surface over O represented on a plane.

PLATE IV.

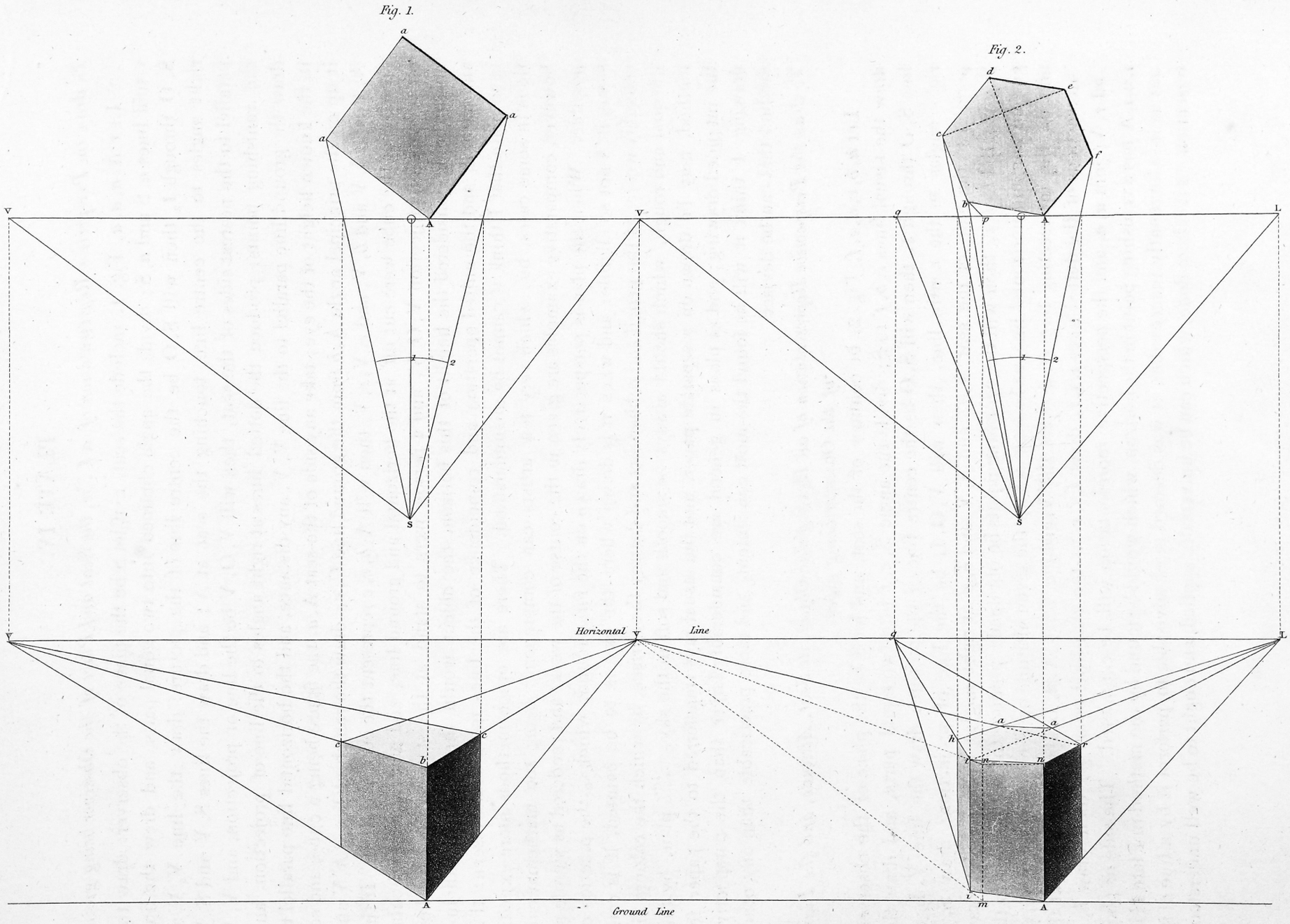
To draw the Perspective Representation of a Cube, the Seat and Place of the Observer being given.

LET A, *a*, *a*, *a*, Fig. 1. include the seat, and let S be the place of the observer: draw the visual lines *a*, S and *a*, S; divide the angle obtained into two equal parts, and draw the line S, O through 1, then will S, O be the centre line of the picture: draw the line V, V at right angles to the centre line, touching the seat at A; and draw the lines S, V and S, V parallel to the nearest sides of the seat, then will V, O, V be the line of projection, and V, V the vanishing points: produce the dotted lines at right angles to the line of projection, and draw the ground line parallel to the line V, V, any distance, and the horizontal line parallel to it, the known height of the eye; take any side of the seat A, *a*, the figure being a cube, and set it up on the principal angle A, *b* from the ground line C, *c*; draw the vanishing lines A, V and A, V, and *b*, V and *b*, V, and *c*, V, *c*, V, then will A, *b*, *c*, *c* represent the cube required. If the drawing of the cube were cut off at the horizontal and ground line, and placed perpendicular on the line of projection V, O, V, and a person were to stand at the station point S, their height being considered the height of this horizon, the object would then appear both just and natural, and the united operation and coincidence of the lines more readily seen: this is so plain that I think it cannot be misunderstood. There are other methods more expeditious in some cases, but which very few artists can comprehend, being too mathematical: however, comparative examples are given in the course of the work, and rendered as simple as possible. When the plan is perspectively drawn on the fore ground, which is the practice of some, it is not so eligible; and when it is drawn where the sky is to be painted, it is considerably worse, as the pencil and rubber dirt and destroy the surface, by which the colours lie unequal and rough, which should always be smooth and soft in the sky. The plan, by this method, may be drawn on a separate paper, and the visual rays transferred to the paper for the intended drawing; and as plans in general are considerably larger than the perspective drawing, I think it will be found the most convenient, and more practicable than any other method that can be devised.

To draw the Perspective Representation of an Hexangular Object, its Seat, Altitude, and the Place of the Observer being given.

Let *a*, *b*, *c*, *d*, *e*, *f*, Fig. 2. be confines of the seat, and let S be the place of the observer: draw the visual lines *c*, *b*, *f* to S; divide the angle S, *c*, *f* into two equal parts, and draw the line S, O through 1, then will S, O be the centre line of the picture: draw the line V, L at right angles to the centre line, then will V, O, L be the line of projection: draw S, L parallel to the side of the seat A, *f*, and S, V and *b*, *p* at right angles to S, L; also draw S, *g* parallel to *b*, *c*, then will the vanishing points be obtained: produce the dotted lines to the ground line and horizontal line, as before; set up the given altitude on the hither angle A, *n*; and on the intersecting line *m*, *n* draw the vanishing lines A, *n*, L and *m*, *n* to V; at the intersections of the dotted lines *i*, *i*, *r*, draw *i*, *i*, *r* to the vanishing point *g*; then draw *h*, L and *r*, V, join *a*, *a*, and the perspective representation will be completed. The side or plane *i*, *n*, *i*, A has a vanishing point in the horizon, which would be found by the method in Plate III.; but as it is frequently inaccessible, it was deemed most advisable to perform it by a line of intersection, as it is here done, which can be universally applied, and ought to be well understood.

PLATE 4.

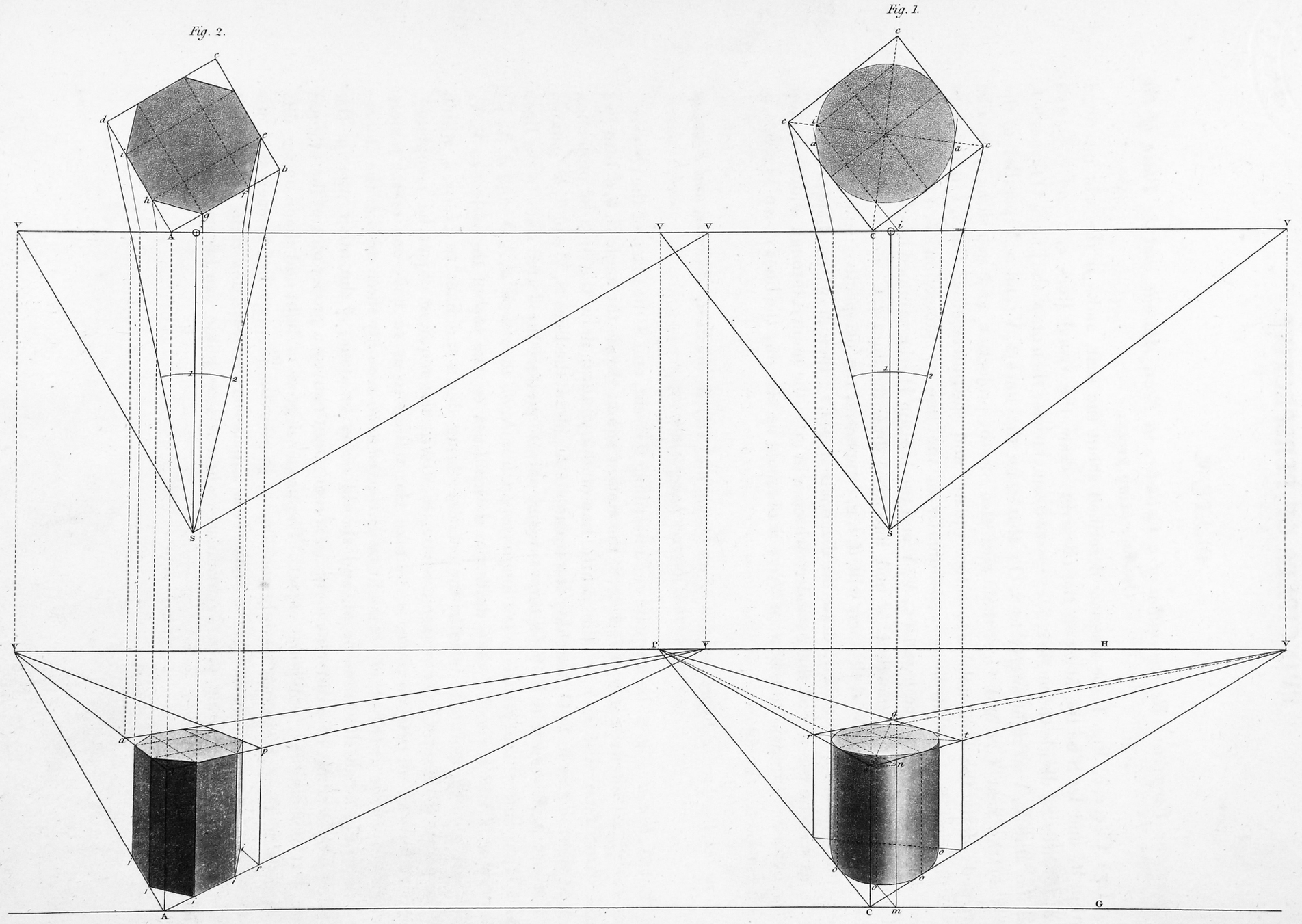


R. Brown del.

London, Printed for Samuel Leigh, 18, Strand, May 1, 1814.

T. L. Busby sculp.

PLATE 5.



R. Brown. del.r

London, Printed for Samuel Leigh, 18 Strand, May 1, 1814

T. L. Busby, sculp.

PLATE V.

To draw the Perspective Representation of a Cylinder, its Seat, Altitude, and the Place of the Observer being given.

LET C, *c*, *c*, *c*, Fig. 1. be a square described about the seat, and *a*, *a* the seat inscribed within it, and let S be the place of the observer: draw the visual lines *c*, S and *c*, S, and *a*, *a*, towards S; divide the angle *c*, S, *c* into two equal parts; then draw the line S, O through 1, and the line V, V at right angles to S, O; also draw the lines S, V and S, V parallel to the sides of the seat C, *c* and C, *c*, then will the line of projection and vanishing points be obtained: draw the diagonals across the square, and the intersecting line *i*, *i* parallel to C, *c*; produce the dotted lines perpendicular to the line of projection V, V; draw the ground line G any distance parallel to V, V and the horizon H, the assumed height of the eye; set up the altitude on the angle C, *d* and line *m*, *n*; draw the lines *d*, C and *m*, *n* to P; also draw *d*, V, C, V, and *r*, V, *t*, P, then will *d*, *t*, *g*, *r* represent the perspective square in which the cylinder is to be described: draw the diagonals *d*, *g*, *t*, *r*; then draw the diameters of the circle, as seen on the top of the cylinder, which will give the points through which the top of the cylinder is drawn: the bottom curve is obtained by bringing the lines down to *o*, *o*, *o*, *o*, which completes the figure.

To draw the Perspective Representation of an Octangular Object, the Seat, Altitude, and Place of the Observer being given.

Let A, *b*, *c*, *d*, Fig. 2. be a square circumscribing the seat, and S the place of the observer: draw the visual lines *b*, *e*, *f*, g, *h*, *i*, *d*, to S, the station point; divide the angle S, *b*, *d* into two equal parts, then will S, O be the centre line of the picture: draw the line of projection V, V at right angles to S, O, touching the square at A; draw the lines S, V and S, V parallel to A, *d* and A, *b*, then will V, V be the vanishing points: produce the dotted lines to the lines G and H, as before, and set the given height on the line A, *d*; then draw *d*, A, V and *d*, A, V; also draw *a*, V and *p*, *r* to V; then draw the dotted lines on the top of the object to V, V, which will give the points to inscribe the octagon: bring down the lines to *i*, *i*, *i*, *i*, *i*, which will be points to describe the octagon below, then will the required object be completed. The best view of an octagon tower is, to take the station so as to have one of the remote sides twice as wide as the other. It might be so viewed as to see only three sides of the object; but this would be an ill chosen point, and should never be done, if the other parts of the building would admit of a different view, as it would not convey a proper idea of the original figure, but of some other polygonal object. The proper degrees of light and shade on the different sides of the object must be duly considered, to give the proper relief to each side, for which rules are given at the end of the book. It is unnecessary to leave any thing of this kind to the choice of the young artist, particularly when a sure guide can be presented to his notice.

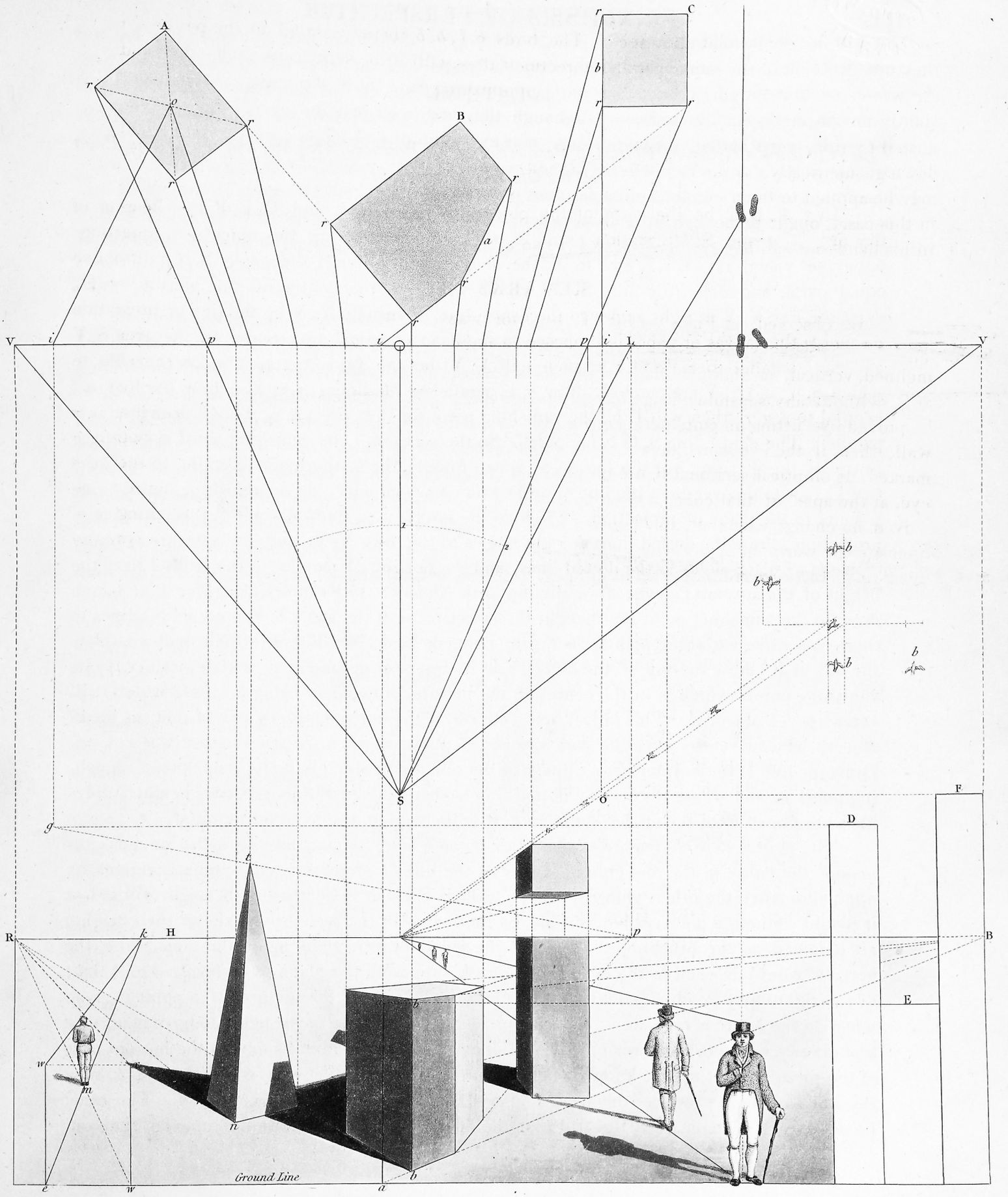
PLATE VI.

Process to draw a Group of Objects in Perspective, their Positions, Heights, and the Station Point of the Observer being given.

LET A, B, C be the seats of the objects to be viewed, and D, E, F the heights of the originals, and S the station point of the observer viewing the objects in question: draw the visual rays *r*, *r*, *r*, &c. to S, the station point; divide the angle S, *p*, *p* into two equal parts, and draw the line S, O, which will give the centre of the picture at O; draw the line V, V at right angles to the centre line, then will V, V be the line of projection on which the canvas or paper is supposed to stand: in a vertical direction, draw the lines S, V and S, V parallel to *r*, *r* and *r*, *r*, then will V, V be the vanishing points for the side to which S, V and S, V are parallel: draw S, L parallel to the line *r*, *a*, *r*, and draw the line *o*, *i* parallel to *r*, *a*, *r*, then will L be the vanishing point for the side *r*, *a*, *r*, and *o*, *i*, to which it is parallel. The centre line S, O being parallel to the seat *r*, *b*, *r*, its vanishing point is at O, the centre of the picture: but if a line were drawn from S, the station point, parallel to *r*, C, the seat C, it would never meet the line of projection; consequently, has no vanishing point, being parallel to the plane of projection. Produce the intersecting lines *r*, *i* and *r*, *i* to the line of projection; draw the dotted lines at right angles to the line V, V, and the ground line any distance at right angles to the dotted lines, and the horizon H parallel to the ground line, the height of the spectator's eye; draw the top of the object E to its intersecting line *a*, *a*, which draw to the vanishing point B; then, at the intersection of the angle *b*, *b*, produce the lines to their respective vanishing points, as already defined, Plate IV. Fig. 2. which will complete the object B: draw the top of the object F to its intersecting line at *o*, which produce to its vanishing point, which is in the centre of the picture, the object being parallel, which will complete the object C. This object being cut off at the horizon, shows a right line, as do all objects whatsoever so cut; the part suspended above shows a section where it was cut off. Draw the line D to the intersecting line *g* of the oblique pyramid, which produce to its vanishing point *p*, and where it cuts the dotted line *t*, there will be the perspective height; and if lines are drawn from the angles *n*, *n*, *n* to *t*, it will complete the pyramid required.

The figures here shewn are supposed to be on a level plane, and the artist on an eminence: the figure in the fore ground stands on the line of projection, consequently retains its original height; the other, going up the picture, is constantly decreasing in height, till at last it would come to a point, or be invisible, as the figures in the back ground shew: their heights are obtained as the other objects are. If the spectator were standing on the same plane, the horizon would descend to the eye of the figures, supposing the plane to be level. The height of any figure may be obtained without its plan, in any part of the picture, if a point is given whereon the figure is to stand:—For example, let *m* be the place of the figure to be drawn: take a point any where in the horizon, as *k*, and draw the line *k*, *m* from its foot to the bottom edge of the picture *e;* set up the known height of the figure on the line *e*, *w*, which draw to *k*, then the line *w*, *k* will pass over the head and give the height of the figure required. The other lines, *w*, *x*, R, demonstrate the truth of the operation. If the ground is uneven, the same

PLATE 6.



R.Brown del.

T. L. Busby scalp.

London, Printed for Samuel Leigh, 18 Strand, May 2nd 1824.

method will do, giving that allowance. The birds *b*, *b*, *b*, *b*, being parallel to the picture, if they are all flying in the same parallel direction, they will all be similar to each other and the same size; those flying off are constantly diminishing, and those flying forward are constantly increasing, as the lines shew. Although they are described in this plate, and delineated by rule, yet I am far from supposing, that every minutia in a picture ought to be laid down geometrically, as the task would be endless; but they are here given to shew how rules may be applied to them. If the student cannot depend upon the accuracy of his eye, which, in this case, ought to be his judge, and where he ought to have the compasses as well as in his hand, he will never be pre-eminent as an artist.

REMARKS.

It was observed, in Plate II. Fig. T. but, for want of room, was not there fully elucidated, that whatever change was made in the position of the plane of delineation, whether inclined, vertical, or oblique, that the appearance would still remain the same to the observer at S, without any sensible change having taken place in the plane of delineation. This may be proved by cutting an equilateral cone obliquely, and placing its sectional surface against a wall; then, if the eye were placed at the vertex, and the cone were removed away, having marked its elliptical sectional figure on the wall, the image there formed would appear to the eye, at the apex of that cone, a circular line; which must be evident, the angle having received no change whatever, but remains the same in either case: but to a spectator standing opposite the wall, the figure would appear an ellipsis. Hence arises the propriety of always drawing pictures according to the situation in which they are to be placed and viewed.

PLATE VII.

Given the Seat and Altitude of an Object, with the Place of the Observer, from thence to project its Perspective Appearance on a vertical Plane placed between the Object and the Observer.

LET *a*, *b*, *c*, *d*, Fig. 1. be the seat, and A, A the altitude, and let S be the place of the observer: draw the converging visual lines *b*, *d*, S, and the intermediate rays *a*, *o*, &c. to S; describe a curve any distance on S as a centre, say *i*, *i*; draw the line of projection V, V parallel to *i*, *i*, agreeably to the width of your required drawing, which is determinable on the extremity of the visual rays, as *x*, *x*, which will be the width; draw the line S, V parallel to *a*, *b*, and S, V parallel to *a*, *d* will be the vanishing points: produce the intersecting line *d*, *p* to the line of projection, and draw the dotted lines at right angles to the line V, V; draw the ground line parallel to V, V, and the horizon, the known height of the eye; set up the height on the intersecting line *h*, *h*, as is shewn by connection of the elevation; draw *h*, *h* to V, and *d* to V; then, at the intersection of the dotted lines *i*, *i*, *i*, *i*, *i*, *i*, draw lines to *u*, and the lines drawn from *n*, *n*, *n* to V will complete the projection required. The dotted line *d*, *i*, in the plan which is drawn parallel to the line of projection, is to prove the truth of the operation. Take the height of the lower elevation and set it to *d*, *i*, the plan; draw *d*, *i* to the station S; then will *x*, *i*, on the line of intersection, be the perspective height of the angle *t*, *i*, which you will find does, and must, perfectly coincide.

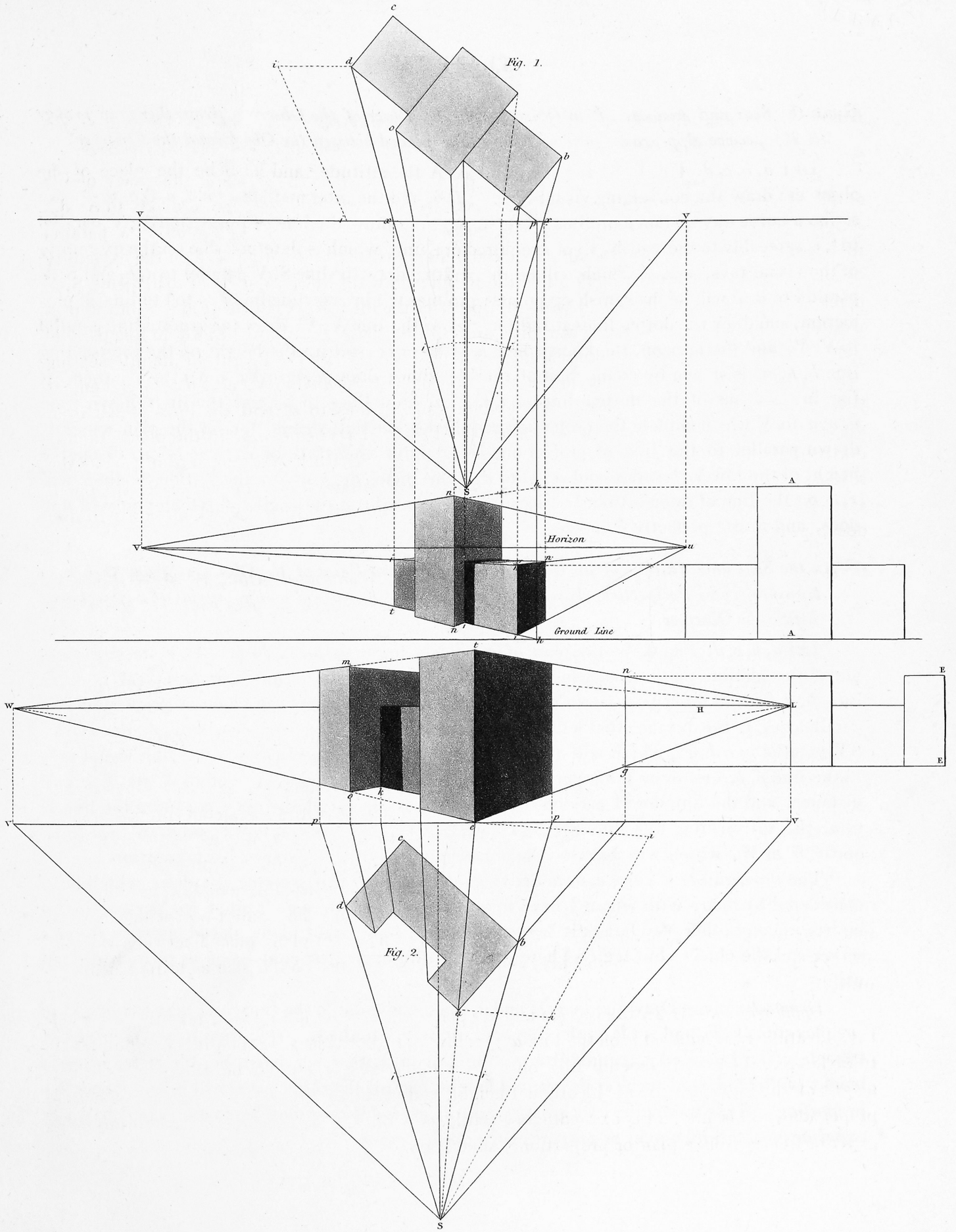
Given the Seat and Altitude of an Object, also the Station Point of the Observer, from thence to transproject its Perspective Appearance on a Plane placed vertically beyond the Object and before the Observer.

Let *a*, *b*, *c*, *d*, Fig. 2. be the plan of an object to be delineated, and E, E its elevation, and S the station point from whence the view is taken: draw the extreme visual rays, or lines *b*, *d*, S; and describe a curve any distance, as *i*, *i*; and draw the plane of projection *p*, *p* parallel to *i*, *i*, the distance that will bring your width to the required size, as *p*, *p*; draw S V, S V parallel to *a d*. *a b*, which will give the vanishing points: produce the diverging visual rays to the line *p*, *p*, and draw them perpendicular to the line *p*, *p*; draw the ground line E, *g* any distance, and the horizon H parallel to it, the known height of the eye; continue the line E to *n*, the intersecting line; draw L, *n*, *t* and L, *g*, *e*; then draw *e*, *t*, W, and draw *o*, *m* to L, and *k* from W, which will describe the object required in true perspective proportion.

The dotted lines *e*, *i* and *a*, *i* are drawn to demonstrate this seeming paradox; which is so considered by many with whom I have frequently contended, who cannot see perspective to be true, in any other way but as it is seen through a transparent plane placed between the observer and the object; but which I here submit with the greatest confidence as to its truth and utility.

Demonstration.—Draw the line *e*, *i* and *a*, *i* perpendicular to the line S, *e*; take the height of the elevation E, E, and set it on the line *a*, *i*; draw S, *i* to the line *e*, *i*: then it is evident, if the triangle *e*, *i*, S be raised perpendicular on the line S, *e*, that *e*, *i* must be the perpendicular height of the line *e*, *t*, as *a*, *i* is its original height, and all the other parts will be in perspective proportion. This method is exceedingly useful, as a drawing may be made to suit any size paper or frame, from a plan or proportional sketch given.

PLATE 7.

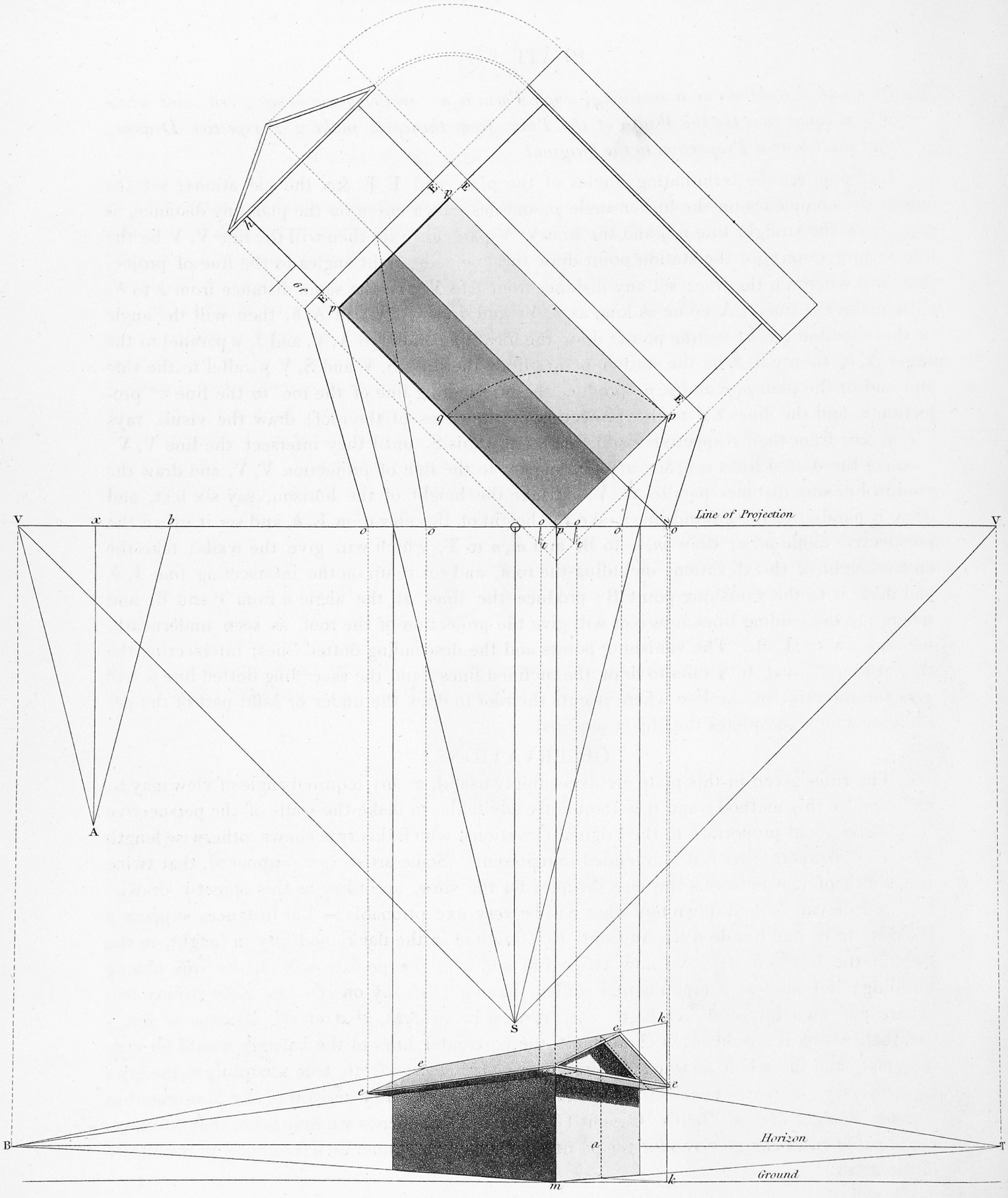


R. Brown del.ᵉ

T. L. Busbu sculp.

London, Printed for Samuel Leigh, 18, Strand, May 1, 1814.

PLATE B.



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London, Printed for Samuel Leigh, 18 Strand, May 1, 1814.

T.L. Busby sculp.

PLATE VIII.

The Plan and Elevations of a Building, whose Form is a Parallelogram being given, and whose Side is equal to twice the Width of the Plan, from thence to make a Perspective Drawing that shall bear a Proportion to the Original.

LET p, p, &c. be terminating angles of the plan, and E, E, &c. the elevations; set the foot of the compasses on the hither angle p, and describe a curve on the plan any distance, as q, p: draw the straight line p, q and the line V, V parallel to it, then will the line V, V be the line of projection: for the station point draw the line x, at right angles to the line of projection, any where on the line; set any distance from x to V, and the same distance from x to b; then make the line x, A twice as long as b, V, and draw A, V and A, b, then will the angle be the direction for the station point: draw the line S, p parallel to A, V, and S, p parallel to the angle A, b, then will S be the station point: draw the lines S, V and S, V parallel to the side and end of the plan p, p and p, p; produce the intersecting line of the roof to the line of projection i, and the lines t, t to the projection of the eaves of the roof; draw the visual rays o, o, o, &c. from their respective visible angles towards S, until they intersect the line V, V; produce the dotted lines o, o, &c. at right angles, to the line of projection V, V, and draw the ground line any distance parallel to V, V; take the height of the horizon, say six feet, and draw it parallel to the ground line; take the height of the elevation E, h, and set it up on the perspective angle m, n; draw m, n to B, and m, n to T, which will give the walls: take the entire height of the elevation, including the roof, and set it up on the intersecting line k, k, and draw it to the vanishing point B; produce the lines at the angle n from T and B, and where the descending lines intersect will give the projection of the roof, as seen underneath, which draw to T, B. The vanishing points and the descending dotted lines, intersecting the roof at e, e, e, e, will be points to draw the inclined lines; and the ascending dotted line a will give the direction of the line where it cuts the roof to draw the under or soffit part of the pediment, which completes the object required.

OBSERVATIONS.

The rules given in this plate are exceedingly useful, as any required angle of view may be obtained by this method; and it is frequently advisable, to make the walls of the perspective drawing in equal proportion to the original elevations, which this rule shews, otherwise length may be destroyed, which it is intended to represent. Some artists have supposed, that twice the width of the picture is the best distance for the view, according as this object is drawn; but no rule can be laid down but what will be very exceptionable:—For instance, suppose a building to be one hundred feet in front, two hundred in the flank, and fifty in height, in the form of the heathen temples; now twice the width of the picture will do for this oblong building: but suppose a monumental edifice, having a balcony on the top, to be twenty feet square and two hundred feet high; then it must be evident, that at the distance of forty-two feet, which it would be, or thereabout, the horizontal lines of the balcony would be very distorted, and the whole appear tumbling down; although perfectly true according to the laws of perspective, however near, but injudicious. This is evidently verified in the Monument at London Bridge, and St. Paul's, Covent-Garden; and from hence we may infer, that no unexceptionable rules can be given for the point of distance, but must be left entirely to the choice of the artist.

PLATE IX.

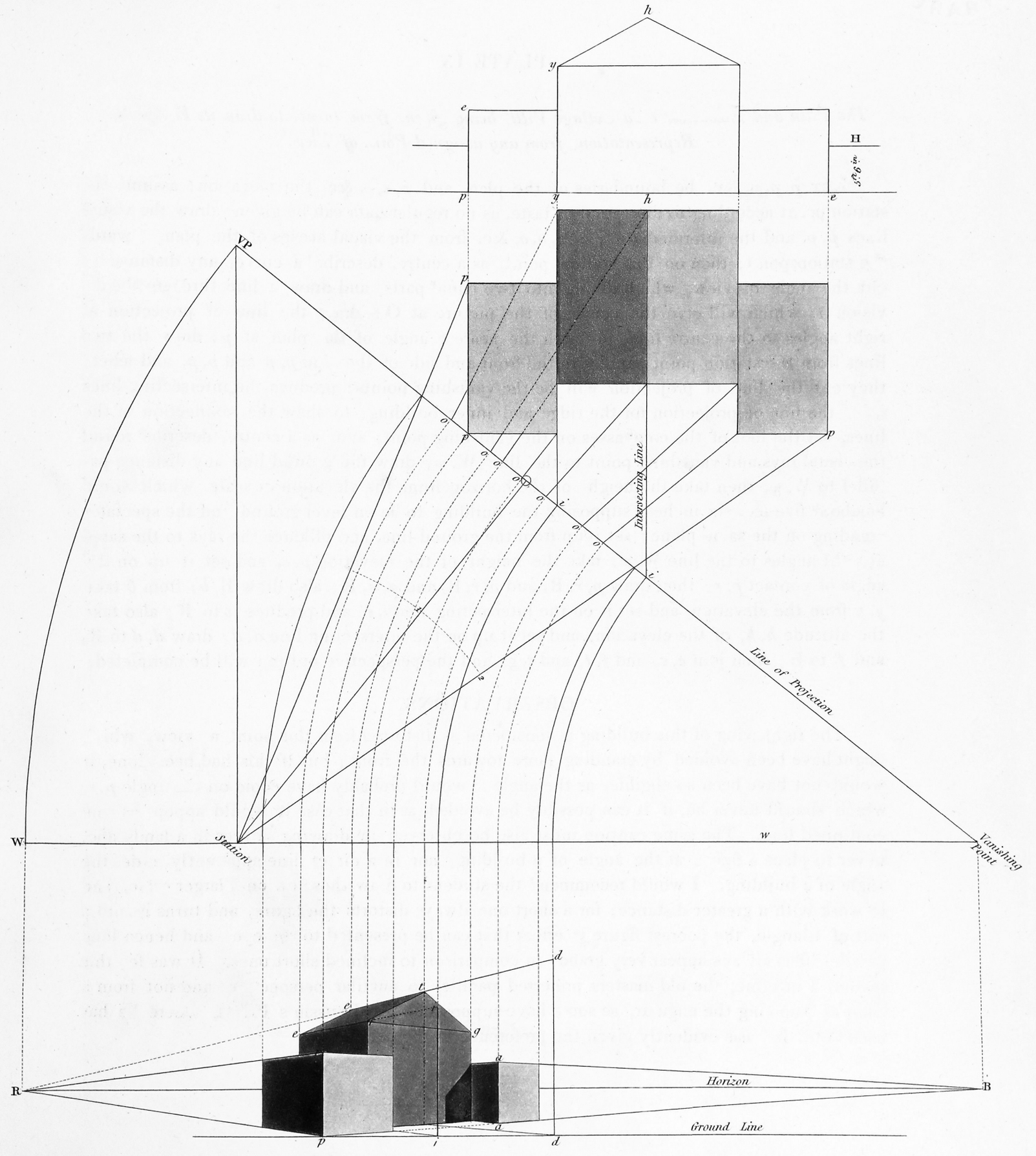
The Plan and Elevation of a Cottage Villa being given, from thence to draw its Perspective Representation, from any assigned Point of View.

LET *p*, *p*, *p*, &c. be boundaries of the plan, and *p*, *e*, *e*, &c. the elevation; assume the station point according to discretion or taste, as no regular data can be given: draw the visual lines *p*, *p*, and the intermediate rays *o*, *o*, *o*, &c. from the visual angles of the plan, towards the station point; then on the station point, as a centre, describe a curve, any distance to cut the angle of view, which divide into two equal parts, and draw a line through the division 1, which will give the centre of the picture at O: draw the line of projection at right angles to the centre line, to touch the nearest angle of the plan at *p*; draw the two lines from the station point parallel to the front and side of the plan *p*, *p* and *p*, *p*, and where they cut the line of projection will be the vanishing points: produce the intersecting lines *i*, *i* to the line of projection for the ridge and inner building; to shew the connection of the lines, set the foot of the compasses on the vanishing point; and, as a centre, describe round the visual rays and vanishing point to the line W, *w*; draw the ground line any distance parallel to W, *w*, then take the height of the horizon from the elevation or scale, which would be about five feet six inches, supposing the building to be on level ground and the spectator standing on the same plane; set it up from the ground line, and produce the rays to the same at right angles to the line W, *w*; take the height of the elevation *p*, *e*, and set it up on the angle of contact *p*, *r*; then draw *p*, *r*, R, and *p*, *r*, B, and *a*, *a*, R; also draw B, *b*; from *b* take *y*, *y* from the elevation, and set it on the intersecting line *i*, *i*, and produce it to R; also take the altitude *h*, *h*, of the elevation, and set it up on the intersecting line *d*, *d*; draw *d*, *d* to R, and *f* to B; then join *e*, *e*, and *f*, *t*, and *t*, *g*, and the perspective outline will be completed.

OBSERVATIONS.

The right wing of this building is considered as distorted from this point of view, which might have been avoided by standing more towards the front; but if this had been done, it would not have been so eligible, as the angle *e* would probably have come on the angle *p*, *r*, which should never be, if it can possibly be avoided, as in that case it would appear as one continued line. The same caution must also be observed in drawing figures in a landscape, never to place a figure at the angle of a building, nor in a direct line apparently under the angle of a building. I would recommend the student to draw those off on a larger scale, and to work with a greater distance; for a short one always distorts the figure, and turns it into a sort of triangle, the poorest figure in effect that can be presented to the eye: and hence long parallel lines always appear very grand, in comparison to inclined short ones. It was for this reason, I imagine, the old masters preferred parallel to angular perspective, and not from a want of knowing the angular, as some have supposed.—See Poussin's Prints, where he has used both, but has evidently given the preference to the parallel.

PLATE 9.

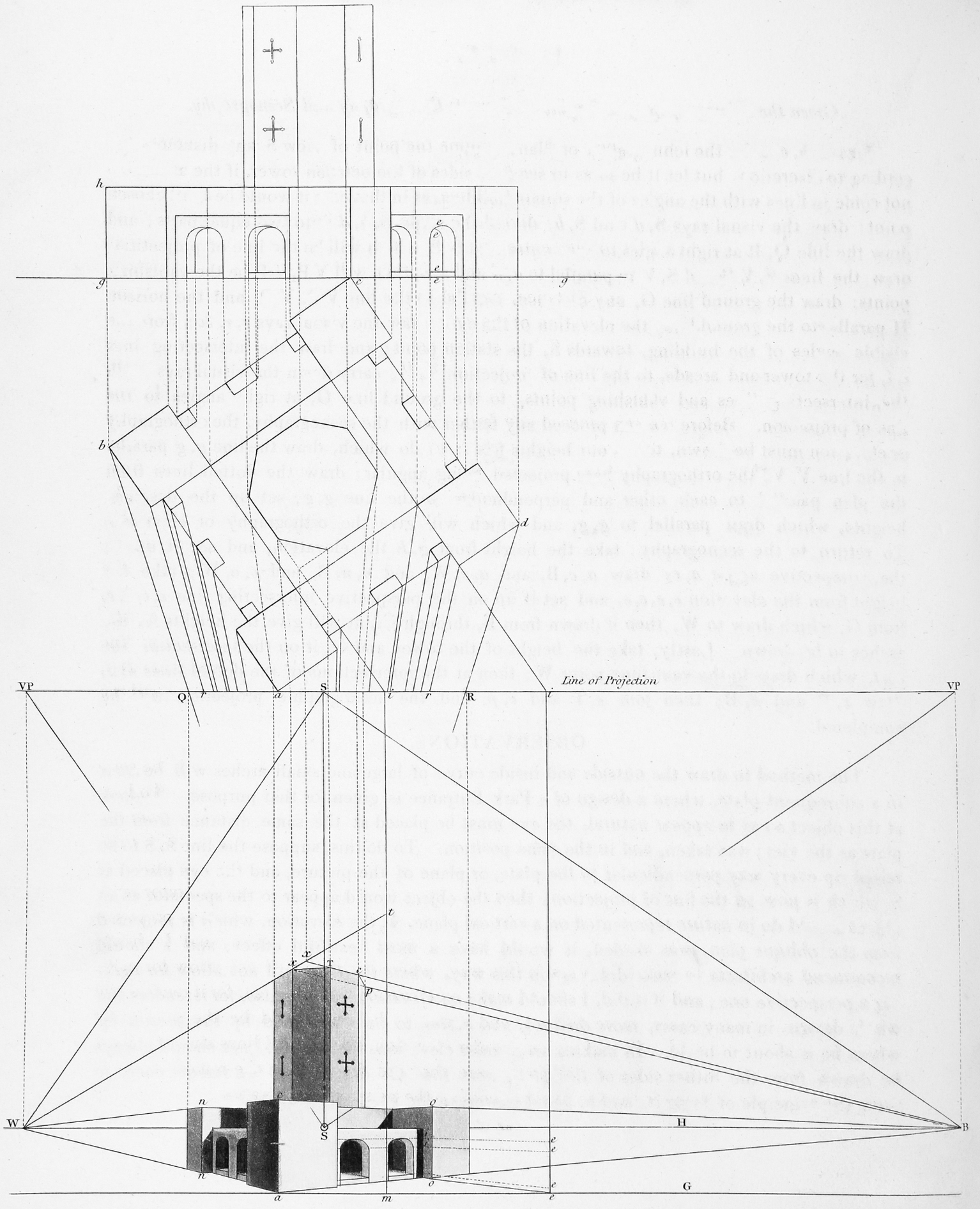


R.Brown del.t

London, Printed for Samuel Leigh, 18 Strand, May 2nd 1814.

T.L. Busby sculp.

PLATE 10.



R. Brown del.

London, Printed for Samuel Leigh, 18, Strand, May 1, 1814.

T. L. Busby sculp.

PLATE X.

Given the Ichnography of a Depôt, to draw its Orthography and Scenography.

LET *a*, *b*, *c*, *d* be the ichnography or plan; assume the point of view S any distance, according to discretion, but let it be so as to see four sides of the octagon tower, if the angles do not come in lines with the angles of the square building, as in that case it would be an ill chosen point: draw the visual rays S, *d* and S, *b;* divide the angle S, *b*, *d* into two equal parts; and draw the line Q, R at right angles to the centre line S, S, which will be the line of projection: draw the lines S, V P and S, V P parallel to *a*, *d* and *a*, *b*, then will V P, V P be the vanishing points: draw the ground line G, any distance, parallel to the line V P, V P, and the horizon H parallel to the ground line, the elevation of the eye; draw the visual rays *r*, *r*, &c. from the visible angles of the building, towards S, the station point; and draw the intersecting lines *i*, *i*, for the tower and arcade, to the line of projection V, V; carry down the visual rays, with the intersecting lines and vanishing points, to the ground line G, at right angles to the line of projection. Before we can proceed any farther with the scenography, the orthography or elevation must be drawn, to get our heights from: to do which, draw the line *g*, *g* parallel to the line V, V, the orthography here projected being angular; draw the dotted lines from the plan parallel to each other and perpendicular to the line *g*, *g;* set up the designed heights, which draw parallel to *g*, *g*, and which will give the orthography or elevation. To return to the scenography: take the height from *g*, *h* the elevation, and set it up on the perspective angle *a*, *c;* draw *a*, *c*, B, and *a*, *c*, W, and *n*, *n*, B, and *o*, *o*, W; take the height from the elevation *e*, *e*, *e*, *e*, and set it up on the perspective intersecting line *e*, *e*, *e*, *e*, from G, which draw to W, then if drawn from B, through *i*, *i*, it will give the heights for the arches to be drawn. Lastly, take the height of the tower and set it on the intersecting line *m*, *t*, which draw to the vanishing point W; then at the intersections of the dotted lines *x*, *x*, draw *x*, B and *x*, B; then join *x*, T and *c*, *p*, and the scenographic projection will be completed.

OBSERVATIONS.

The method to draw the outside and inside curve of large and small arches will be seen in a subsequent plate, where a design of a Park Entrance is given for that purpose. To look at this object so as to appear natural, the eye must be placed at the same distance from the plate as the view was taken, and in the same position. To do this, suppose the line S, S to be raised up every way perpendicular to the plate, or plane of the picture, and the eye placed at S, which is now on the line of projection; then the object would appear to the spectator as an object would do in nature represented on a vertical plane. If the elevation, which is projected from the oblique plan, was shaded, it would have a most beautiful effect; and I should recommend architects to make drawings in this way, where the time will not allow for making a perspective one; and if it did, I should make an elevation this way also, for it renders the whole design, in many cases, more distinct, and easier to be understood by the person for whom he is about to build. In making an angular elevation, the vertical lines should always be drawn from the hither sides of the plan; here they are drawn from the remote ones, to shew the principle of doing it, and to avoid confusing the perspective operation.

PLATE XI.

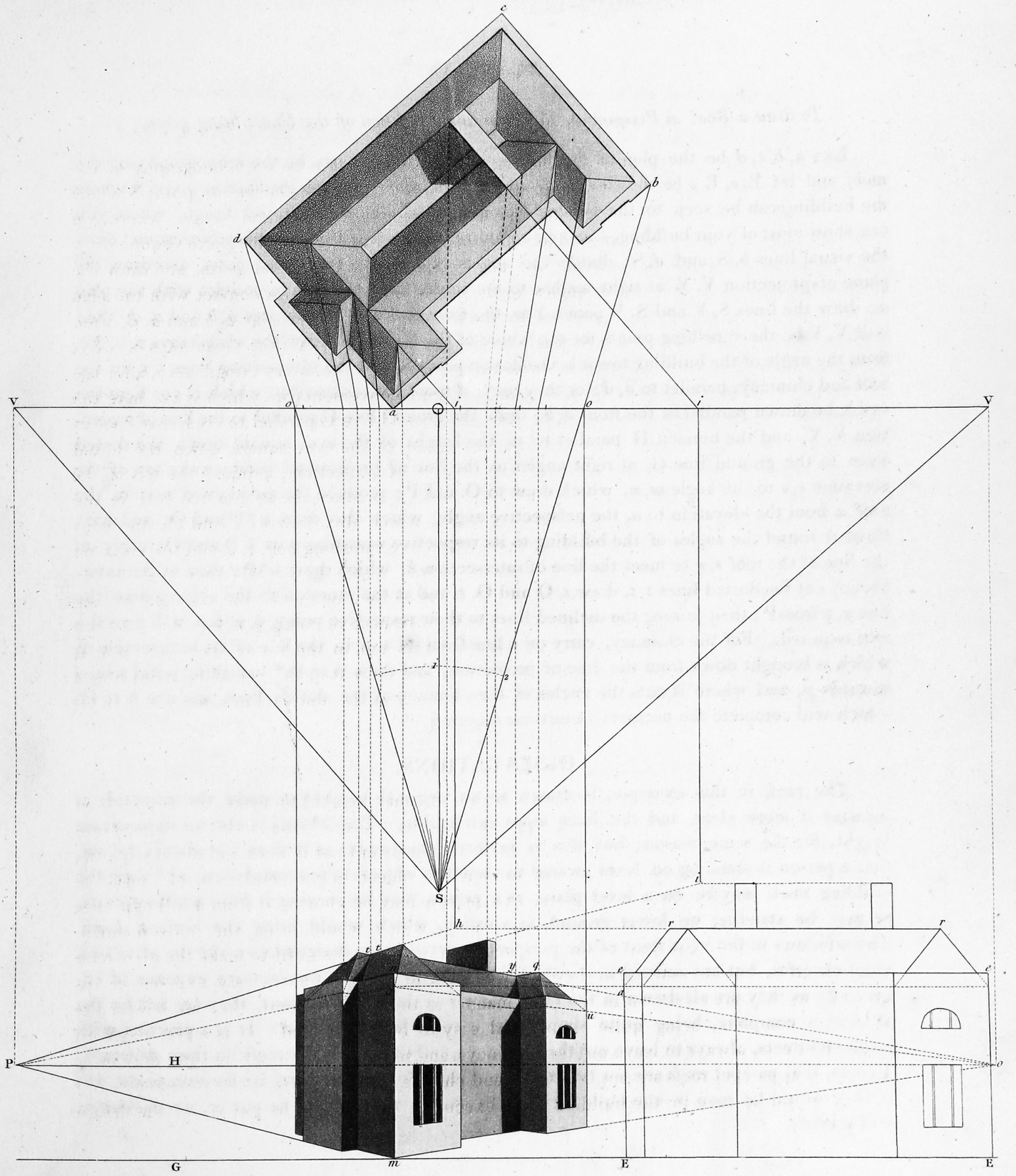
To draw a Roof in Perspective, the Plan and Elevation of the House being given.

LET *a*, *b*, *c*, *d* be the plan of the house, and the inner parts be the ichnography of the roof; and let E, *e*, E, *e* be the elevation, and *r*, *r* the roof; assume the station point S where the building can be seen to the greatest advantage,—for an architectural design, where you can show most of your building,—and for a picture, where it will look most picturesque: draw the visual lines *b*, S and *d*, S; divide the angles S, *b*, *d* into two equal parts, and draw the plane of projection V, V at right angles to the centre line, to come in contact with the plan *a;* draw the lines S, V and S, V parallel to the front and end of the plan *a*, *b* and *a*, *d*, then will V, V be the vanishing points for the whole of the building: draw the visual rays *o*, *o*, &c. from the angle of the building towards the station point S, and the intersecting lines *i*, *i*, for the roof and chimney, parallel to *a*, *d;* or they may, if more convenient (but which is not here the case), be drawn parallel to the front *a*, *b;* draw the ground line G parallel to the line of projection V, V, and the horizon H parallel to it, the height of the eye; square down the dotted lines to the ground line G, at right angles to the line of projection; produce the top of the elevation *e*, *e* to the angle *m*, *n*, which draw to O and P; produce the ascertained seat of the roof *a* from the elevation to *a*, the perspective angle, which also draw to P and O, and continue it round the angles of the building to its respective vanishing points P and O; carry on the line of the roof *r*, *r* to meet the line of intersection *h*, which draw to P; then at the intersections of the dotted lines *t*, *t*, draw *t*, O and O, *t*, and at the junction of the angle *y* draw the line *y*, *q* from P; then joining the inclined lines to their respective points *q*, *u*, &c. will give the roof required. For the chimney, carry on a line from its top to the line of its intersection *i*, which is brought down from the line of projection, and draw it to the vanishing point from *i* towards *p*, and where it cuts the angles of the chimney at the dotted lines produce it to O, which will complete the perspective outline required.

OBSERVATIONS.

The roof, in this example, is drawn to an unusual height, to make the principle of drawing it more clear, and the lines more intelligible. The horizon is also an immoderate height, for the same reason; but this is perfectly consistent, as it does not always follow, that a person is standing on level ground to view the object in contemplation, although the building itself may be on a level plain, as a person may be viewing it from a hill opposite, or may be standing on lower ground, as a valley, which would bring the horizon down. The windows in the light front of the perspective drawing are designed to make the plate look more cheerful, but are omitted in the shadowed side, to prevent unnecessary expence of engraving: as they are all drawn in the same manner as those of the front, they are left for the student to complete, being quite simple and easy to be understood. It is a practice with some architects, always to leave out the chimneys, and sometimes the roofs, in their drawings: I grant, that parapet roofs are not beautiful, and chimneys not uniform are no ornaments, but if they would be seen in the building when executed, they should be put in, or the design will mislead.

PLATE II.

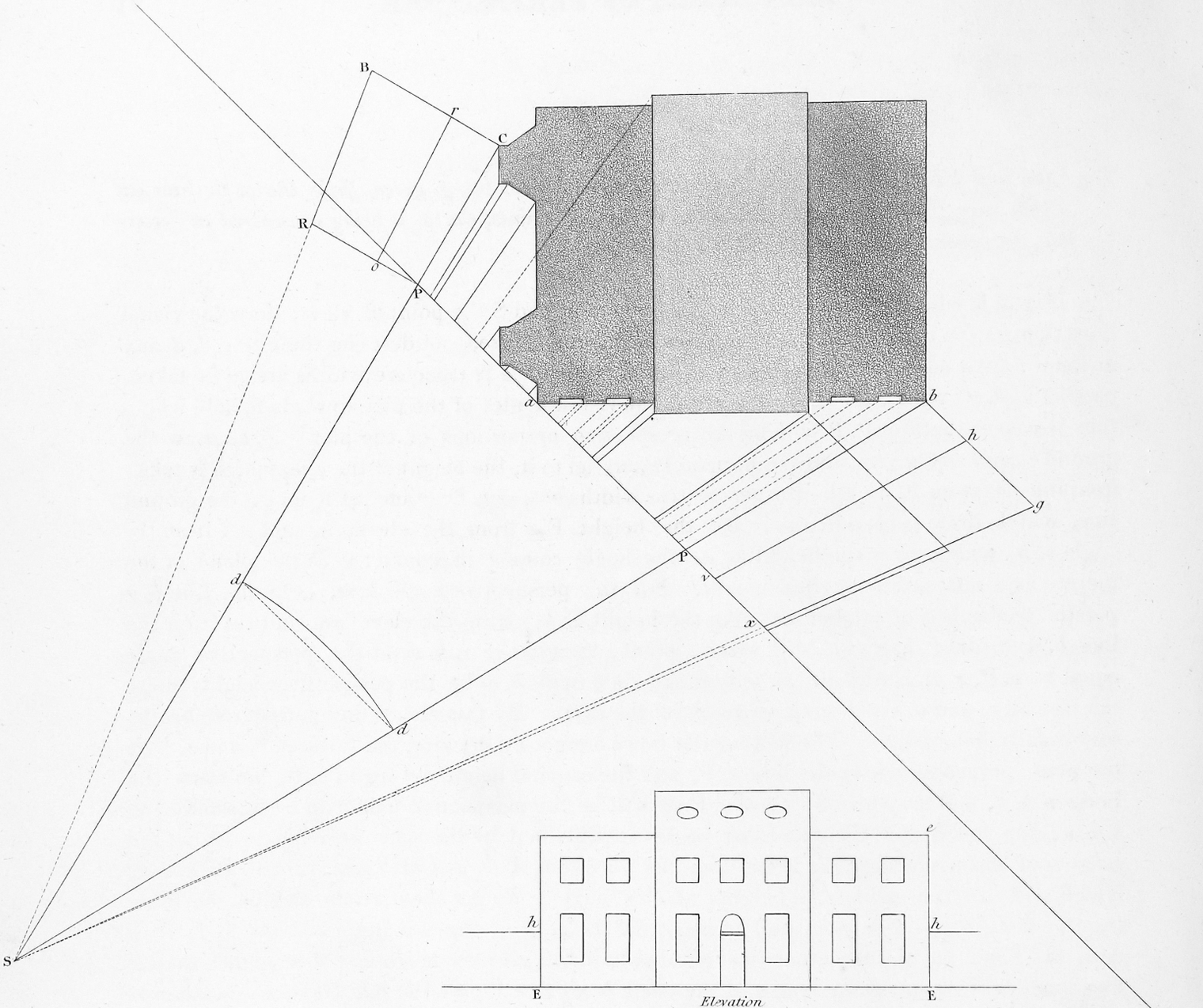


R.Brown del.

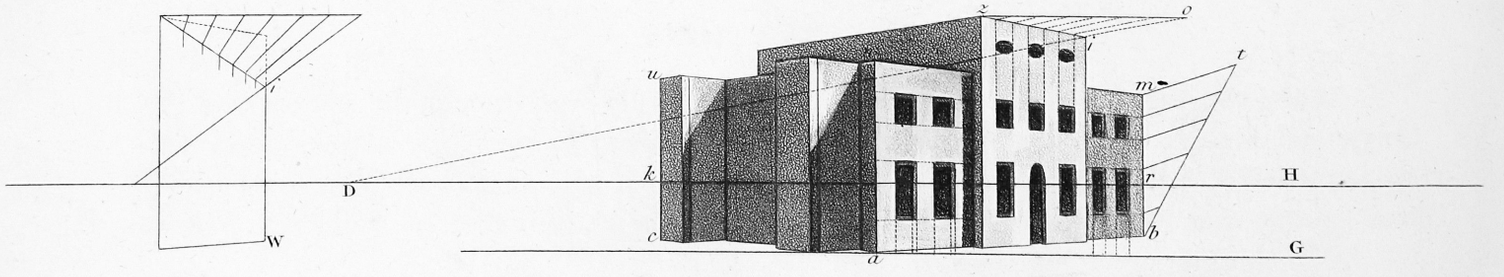
T. L. Busby sculp.

London, Printed for Samuel Leigh, 18 Strand, May 2nd 1814.

PLATE 12.



Elevation



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London, Printed for Samuel Leigh, 18, Strand, May 1, 1814.

T. L. Busby sculp.

PLATE XII.

The Plan and Elevation of a Villa, with the Point of View being given, from thence to draw its Perspective Representation, without the Vanishing Points, the same being considered inaccessible, or extending beyond the Length of the Room.

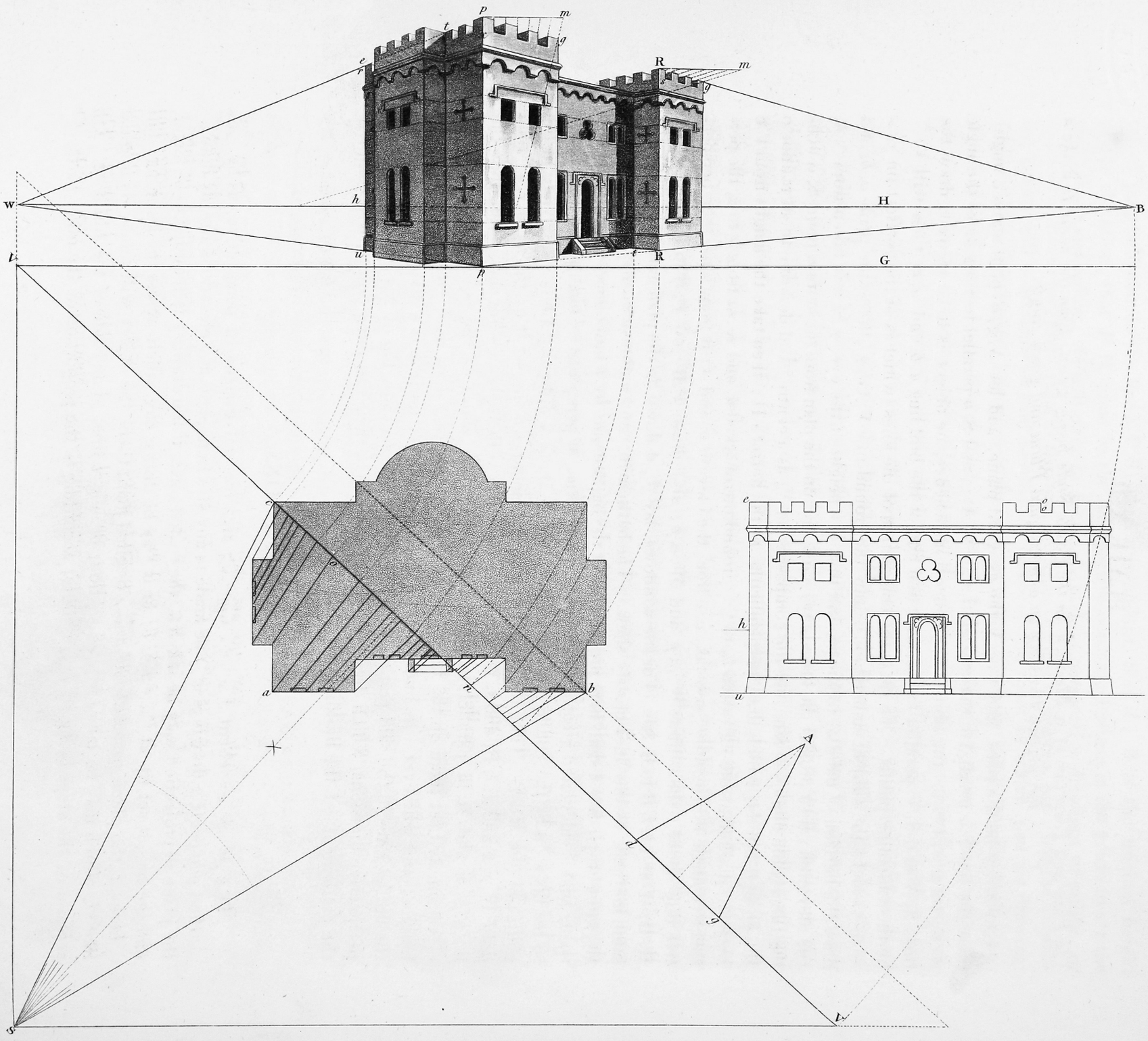
LET *a*, *b*, *c* be the plan, and E, E the elevation, and S the point of view: draw the visual lines S, *b*, *c*; set the foot of the compasses on S, as a centre, and describe the curve *d*, *d* any distance; draw the line of projection *p*, *p*, on which the perspective widths are to be taken, parallel to *d*, *d*; then draw visual lines from the visible angles of the plan towards S, and where they intersect the line P, P will be the perspective proportions of the plan *a*, *b*, *c*; draw the ground line G any where, and the horizon H parallel to it, the height of the eye, which is taken from the elevation E, *h*; take the perspective widths between P, P and set them on the ground line, which draw perpendicular; take the height E, *e* from the elevation and set it on the angle *a*, *n*, which gives the height at *a*; the angle coming in contact with the plane of the picture at *a* retains its original height. For the perspective angle *b*, *m*, draw the line *b*, *g* parallel to the line of projection; take the height E, *h*, *e* from the elevation, and set it on the line *b*, *h*, *g*; draw *h*, *g* to S, the station point; then make *r*, *b*, *m* at the perspective angle equal to *v*, P, *x* at the plane of projection, then will *b*, *m* be the perspective height: draw the line *m*, *n*, and *a*, *b* will give so much of the front. By this means any perspective height may readily be obtained. The hexangular bows are got by drawing the lines P, R and *c*, B at the plan, perpendicular to the line *c*, P, and the original height set up at *c*, B, including the horizon *h*, *h*, and drawn to S; then *o*, P, R will be the perspective height to be transferred to *k*, *c*, *u*: the heights of the remaining angles are obtained by the same principle. To get the heights of the windows, take them from the elevation E, *e* and set them on the angle *a*, *n*, which will be their respective heights at this angle. To get them at the angle *b*, *m*, draw the line *b*, *t*, in any direction, and transfer the heights of the windows on this line; then draw the line *t*, *m*, and the other lines parallel to it will give the heights at this angle; then if lines are drawn from the angle *a*, *n* to the angle *b*, *m*, it will give the heights of the windows: their widths may also be obtained without the plan, by drawing a line parallel to the horizon, as *z*, *o*, and the widths set on it and drawn through the angle *i* to cut the horizon, then the point D, where it intersects, will be the directing point for the divisions on the line *z*, *o*, to be drawn, which will give the widths required.

OBSERVATIONS.

When the intersections of the lines *z*, *i*, *o* are not easily seen through the acuteness of the angle and distance of the dividing point D, the line *z*, *i* may be made more obtuse to the perpendicular line *i*, W, as the annexed diagram shows, which will bring the dividing point nearer, and equally true. For demonstration of the perspective heights, imagine the triangle S, P, *c*, B,

raised perpendicular to the line *c*, P, S; then it is evident, that if *c*, B is the original height of the elevation, that P, R must be the perspective one: the horizon is the guide to set the parts above and below. It will often be found, in making perspective drawings of public, or extensive private buildings, such as theatres, asylums, colleges, palaces, &c. that the vanishing points will sometimes extend beyond the limits of the room in which you are drawing. I speak from experience, having had the two extreme vanishing points twenty feet apart, which obliged me to devise this method, and which I always draw by when I have not sufficient room for the vanishing points. In practice, the plans of buildings are always to be drawn on a separate sheet of paper, and the visual rays transferred for the perspective drawing; but in most of these plates they are both drawn on the same, to shew their connection more clearly. For facility in transferring the visual rays, it is best to lay the edge of a slip of paper along the line of projection, and draw the visual rays on it; then by marking with a pencil the perspective inclinations of the top or bottom lines of the building between the visual rays, and denoting by circles what are columns; to avoid mistake and confusion, you may then transfer it to the sheet of paper for the intended drawing, and square them on it. I very frequently, when I am making a perspective drawing on antiquarian paper, for convenience, draw the plan on a small sheet, to a lesser scale, and double all the distances and heights in the perspective drawing, which is equally true and very little more trouble, as the measures may be taken off by the proportionable compasses; or the proportions may be enlarged to any required size by the 20th geometrical problem: but whenever the vanishing points extend beyond the length of your board, slips of wood must be screwed on to receive them, and a long rule be made use of to draw the inclined lines.

PLATE 13.



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London, Printed for Samuel Leigh, 18 Strand, May 2nd 1814.

T. L. Busby sculp.

PLATE XIII.

The Plan and Elevation of a Mansion in the Castle Style being given, from the same to make a Perspective Drawing on any assigned Plane and given Angle.

LET a, b, c be the plan, and V, c, V the assigned plane, and let A, g, d be the given angle: draw the line S, c parallel to the side of the angle A, g, and S, b parallel to the side of the angle A, d, then will S be the point of distance from whence the object is to be viewed: draw the lines S, V and S, V parallel to the front and end of the building a, b and a, c, then will V, V be the vanishing points. To shew the connection of the lines (which is of the greatest importance to make the subject understood), draw the ground line V, G parallel to the plane a, b, and draw the horizon H parallel to the ground line, the height of the eye, which is taken from u, h, the elevation; transproject the visual rays n,a,o, &c. on the plan from the station point S, touching the visible angles a, &c.; set the compasses on V, as a centre, and describe them round to the ground line G, which draw perpendicular to the horizon H; then take the height from the horizon, marked at the elevation h, to the ground line marked u, and set it from h to u, the perspective angle downwards; also take h, e from the elevation, and set it from h to e, the perspective one above; then draw W, u, p and W, e, p; also draw P,B and P, B to B; then draw R, R, W and t, t, B to B, &c. For the windows, lay them down on the plan and proceed by the same method, as the lines clearly shew. The battlements and embrasures may be obtained in the same way; but I shall here proceed to get the battlements by a much more expeditious method, that is calculated greatly to facilitate the practice of perspective: but its principle is not so readily seen by the young student as the other method, a difficulty I hope to obviate in the course of the work. Take the height of the battlement o, o and set it on the angle r, e; then draw W, r, x and x, s, B, and s, W, and so round will give the height. For the width, draw the lines p, m and R, m parallel to the horizon; take the width of the battlements from the elevation, and set them on the line p, m and line R, m; then draw m, g and m, g to cut the horizon, and wherever the lines come in contact with the horizon is a dividing point; draw the dotted lines to the said points, and where they intersect the top of the wall will be the perspective divisions, which drawn perpendicular and to their vanishing points, will complete the battlements of the building required.

OBSERVATIONS.

This is an excellent rule for drawing architectural designs in perspective, as by this method perspective drawings may be made to any size from plans and elevations already drawn: the plane of projection may be taken at the dotted lines, if the drawing is required to be larger, and the height set up at the angle b; or it may be drawn any where across the building; but wherever the plane passes through the original plan, there the object will retain its original height, which may be taken for the section, or height line, at any side of the building. On account of the steps being so very minute, according to the proportion of the other parts, the

method is shown in another plate where the plan admits of their being larger and more distinct: and this will account for a number of plates being necessary to make the science of perspective clearly understood; for when a number of parts are crowded into one design, the whole becomes confused and discouraging, by which the student is literally lost in a labyrinth.

The architectural student must observe, that when a building is accompanied with landscape and figures (as it must be, otherwise it will be building castles in the air), that the centre of the picture should then be laid down in the centre of its horizontal length; and, of course, must be in the horizontal line, whether it be a long or upright drawing. This will carry its own consistency along with it, as we should reasonably station ourselves directly, or nearly, opposite the centre of a picture to view it. This rule is exceptionable in internal views and in a direct view of a street; here one third is generally allowed for the centre. We may very frequently see the greatest absurdities committed in drawings, for want of this consideration. A square building, for instance, is sometimes represented singly, with one front parallel to the plane of delineation and the other vanishing into the horizon, without any other object in the picture to balance it; and sometimes the vanishing point is at or near the edge of the drawing. I never see a picture of this kind but it always offends my eye for want of the other part, which appears to have been disjointed or cut off. This is what artists call a half picture, which will be more fully exemplified when we come to parallel perspective.

REMARKS.

It has been observed, that a circle seen obliquely would generate to the eye an oblique cone of rays, and always present one of its diameters apparently shorter than the other, in a direct visual line to the eye. This is a circumstance which ought to be particularly noticed; and as it is a figure of some importance, I shall here point out the erroneous ways in which it is generally drawn, that the young student may avoid them; but shall defer the demonstration and rule for drawing it to a subsequent plate:—For instance, if a square tower is represented in a picture, with its two visible fronts oblique to the plane of delineation and vanishing into the horizon, each side having a clock or circular window, its elliptical appearance is generally represented with its shortest diameter horizontal, and the longer one vertical; which never is true, unless the horizontal line passes through the centre of the original circle. Others have supposed, that the longer diameter should be drawn vertical, but that the shorter should be drawn to the vanishing point of that side of the tower in which it is placed; both of which are erroneous: for the circle in this position, which would appear an ellipsis, will have its minor diameter inclined, or in a direct line to the eye, and the major diameter would be at right angles to it; consequently they will both be inclined to the plane of the picture. This is always the case when the circle is seen in an oblique plane, placed either above or below the horizontal line.

PLATE 14.

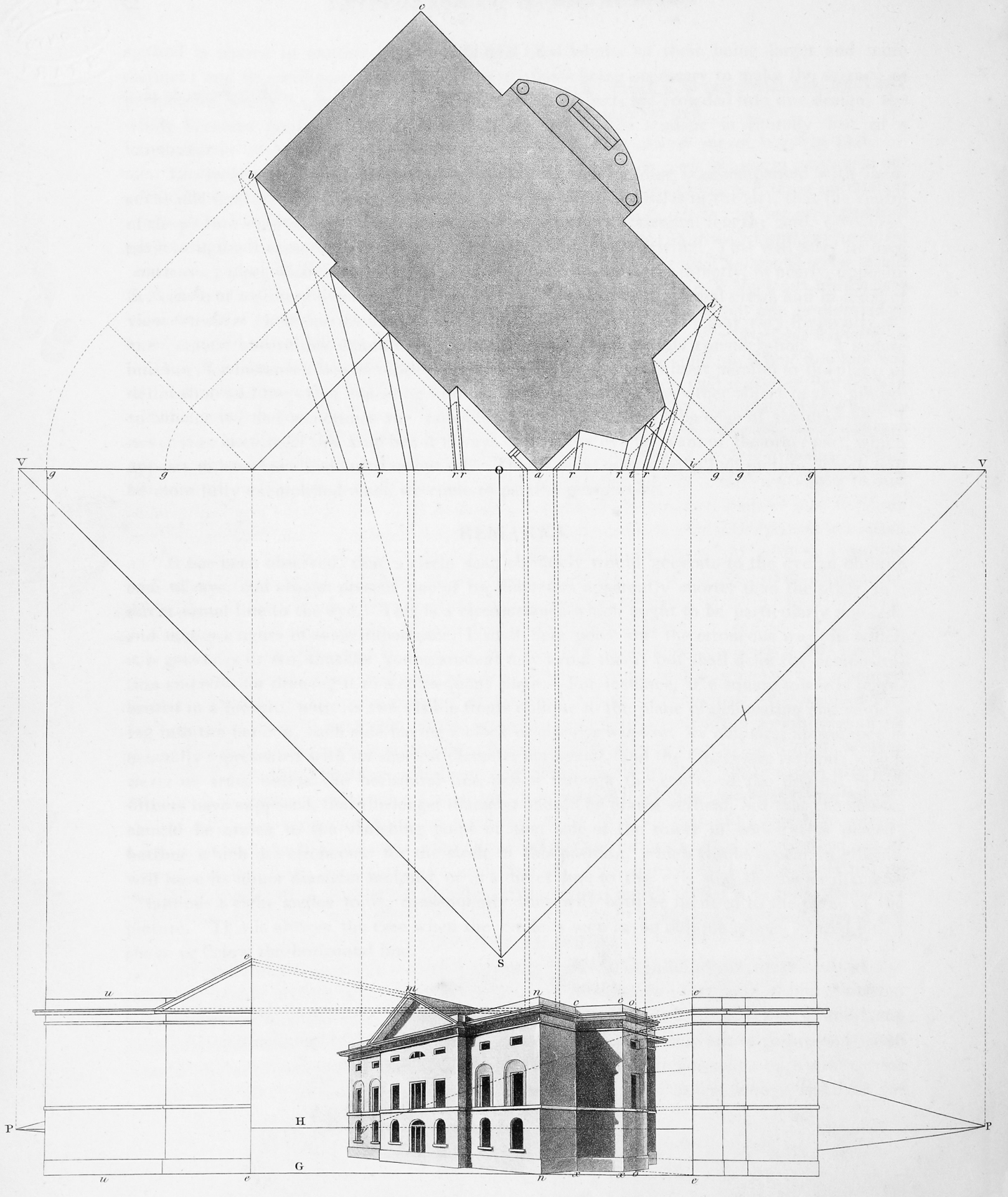


PLATE XIV.

The Plan and Elevations of a House, having a Cornice and polygonal Bow, being given, to shew how the same is to be perspectively represented.

LET *a*, *b*, *c*, *d* be the seat or plan of the house, and let *e*, *e*, *e*, *e* be the outlined figure of the elevation, produced from the dotted lines *g*, *g*, &c. which is seen by construction: take the station point S at any discretional distance, but let it be so much towards the end of the building as to see part of the remote side beyond the bow, otherwise a great part of the magnitude of the building will be lost, and it will not convey so perfect an idea of the figure of the house when separated from the plan; draw the lines S, *b* and S, *d* from S, including the whole seat within the angle S, *b*, *d*; then draw the line S, O through the middle of the angle S, *b*, *d*, as heretofore, and the line of projection at right angles to it, coming in contact with the angle *a*; produce the lines S, V and S, V to the line of projection, and parallel to the hither sides of the seat *a*, *b* and *a*, *d*, then will V, V be the vanishing points for all lines parallel to *a*, *b* and *a*, *d*: draw the visual rays *r*, *r*, *r*, &c. from the visible angles of the plan direct towards S, the station point; then draw the ground-line G parallel to the line V, V, any distance, and the horizon H parallel to it, the supposed height of the eye; produce the visual lines *r*, *r*, *r*, &c. and the vanishing points V, V to the ground-line G and horizon H, at right angles to the line of projection; then, for the perspective object, produce the top and bottom lines of the elevation *u*, *u* to the adjacent angle *n*, *n*, which, drawn to P, P, will give the perspective inclinations of the right-angled part of the building: for the polygonal projection, produce an intersecting line from the seat *i*, *i* and the visual ray *t*, which carry down to *e*, *e* and *o*, *o*; then advance the dotted lines *e*, *e* towards the point P, on the left hand, until they meet the line *o*, *o*, which will give the height of the bow at their junction: then the top and bottom of the bow will be obtained by drawing the lines to and from P, on the right hand, through *o*, *o*, to meet the descending visual rays. The surface, *c*, *c*, *x*, *x*, is accomplished by drawing the lines *c*, *c*, *x*, *x* where the descending visual rays would intersect the inclined lines *n*, *c*, *n*, *x*, and *o*, *c*, *o*, *x*. To represent the cornice, lay down its projection in plano around the seat, and let lines be drawn to the perspective object from its section where the cornice is cut off at the angle *a*; then if the horizontal cornice is produced to the angle *n*, to meet the dotted lines, it will give points in the inclined lines, which may be drawn to their vanishing points. The cornice round the bow, and the windows in it, are done in the same manner, with the difference of drawing the lines *e*, *e* to P, on the left hand, to which they converge. The cornice in the pediment *m* is the same in description as the bow, therefore it is needless to describe it; but observe, the lines are tending to the right-hand vanishing point: the line S, *z* gives a vanishing point at *z* for the distant return of the soffit of the cornice in the bow, and which has been defined in Plate III.

OBSERVATIONS.

In this design, the building is intended to have a portico with coupled columns at the front entrance, and to have three windows in the height of the end *n*, *x*, and the side of the polygonal bow *x*, *c*, *x*, *c*, &c. I should advise the student to draw them off, and to complete the designs according to the descriptions, and likewise to shadow and colour them when the lines are performed, as a pleasing and essential advantage will thereby be obtained, that of embodying his linear figures, and of acquiring a freedom of shadowing and tinting at the same time.

PLATE XV.

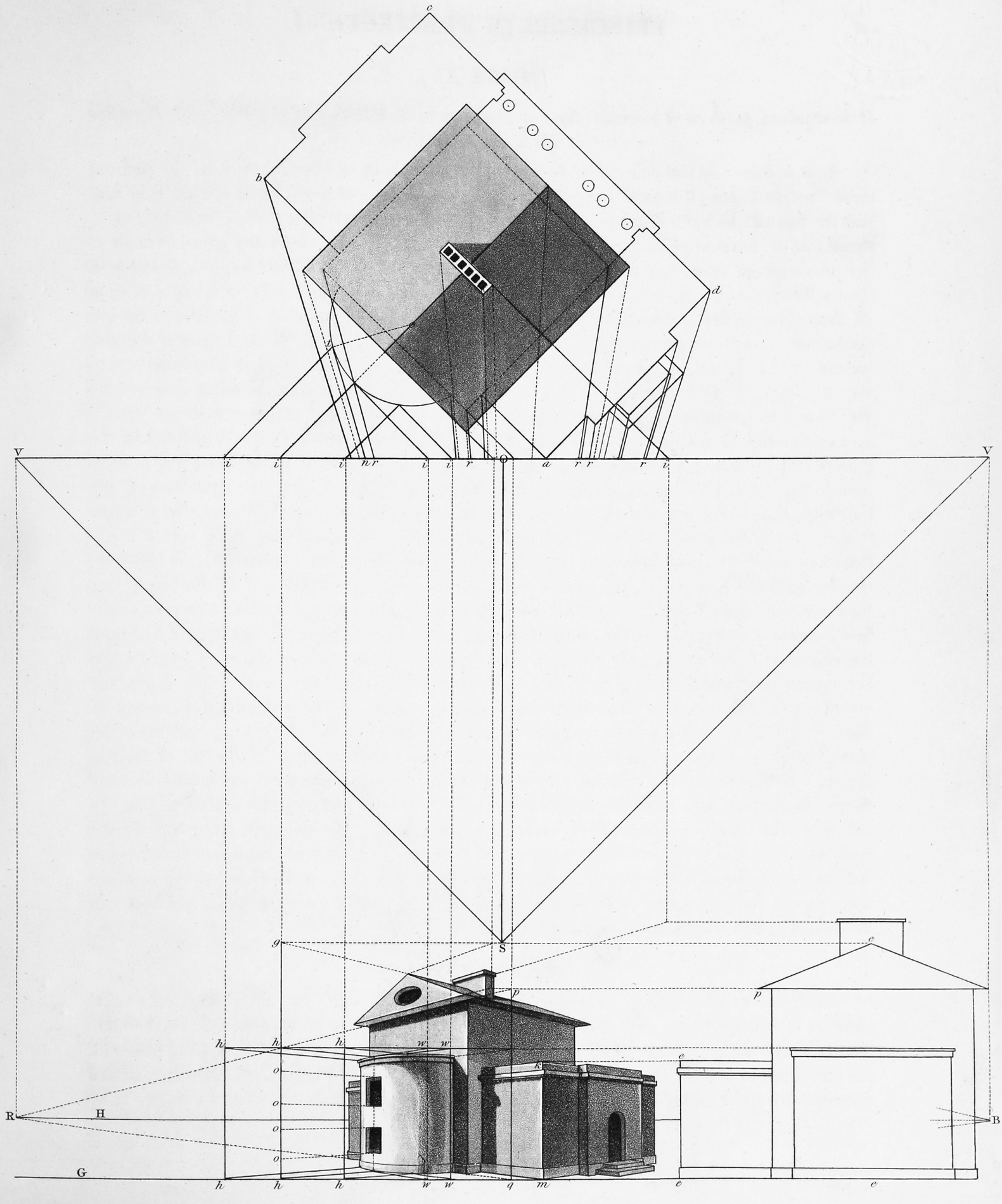
It is required to draw a circular Bow in Perspective, the Outline of the Plan and Elevation of the House being given.

LET *a, b, c, d* be the plan of the house, and *e, e, e, e* be the elevation: assume the point of view S where you can have the best prospect of the house; then draw the angle of view S, *b*, S, *d*, and the centre line S, O through the centre of the said angle of view; also draw the line of projection V, O, V at right angles to the centre line, and in contact with the adjacent angle of the plan *a;* then draw the lines S, V and S, V parallel to the sides of the house *a, b* and *a, d*, then will V, V be all the vanishing points of this object: draw the visual rays *r, r, r*, &c. from all the angles of the house that would be seen by the spectator standing at S towards S, and ending on the line of projection, then will the rays *r, r, r*, &c. be the vertical lines of the perspective building, which are to be projected on the plane of the picture and perpendicular to the line V, O, V. Now to represent this on the paper lying horizontally and detached from the plane of projection, first, draw the ground line G any sufficient distance from the station S, and parallel to the line of projection V, O, V, and make the horizon H parallel to the ground line G, the height of your eye; i. e. if supposing yourself to be about five feet six inches high, and the ground on which you stand rises a foot higher than the base of the building, your horizon would then be six feet six inches from the base upwards, and if below or down hill, *vice versa*. For the bow, draw any number of intersecting lines, as *i, i, i*, &c. from its seat: but two of them are requisite to be produced from a certain place in the seat; the one from the centre *o* to the plane of projection, which gives the seat of the height line for the windows over that line; the other is, where a visual ray would become a tangent to the bow, which is at *t*. To find the point of contact of the visual line *t, n*, at *t* draw a line from the centre *o* of the bow at right angles to the ray *n, t*, which is soonest done with a right angle set square, and which will give it at *t*. For the perspective elevation, bring down the visual rays and intersecting lines with the vanishing points to the ground line G; carry on the wing of the elevation *e* to the angle *k, m*, which, if drawn to the vanishing points R and B, it will give the perspective of those parts. For the main building, carry on the line of the roof *p, p, p*, and the base of the building *e, e*, to *q;* then if lines are drawn from the intersections of the perpendiculars *q, p, p* to the vanishing points R and B, it will give the central part of the building: the roof is obtained by drawing the line *g* to B. For the bow, draw the height lines *h, h, h, h, h, h* to B, and the heights *w, w, w, w* to R, then at their angles of concurrence will be points through which to draw the curves of the bow. For the windows in the bow, set them on the line *o, o, o*, &c. and produce them to B, and where they intersect the bow will be their heights; which are all the essential parts of the building.

OBSERVATIONS.

In drawing the curves of a circular bow, it is best to perform the whole elliptical or oval contour in pencil, on the top and at the bottom of the bow, as its defects will be the more readily seen, and accurately guide the other curves of the cornice. It is by finding points in the curvature of regular or irregular figures, that their apparent forms are obtained; nor can there be any other method devised by which that end can be effected.

PLATE 15.



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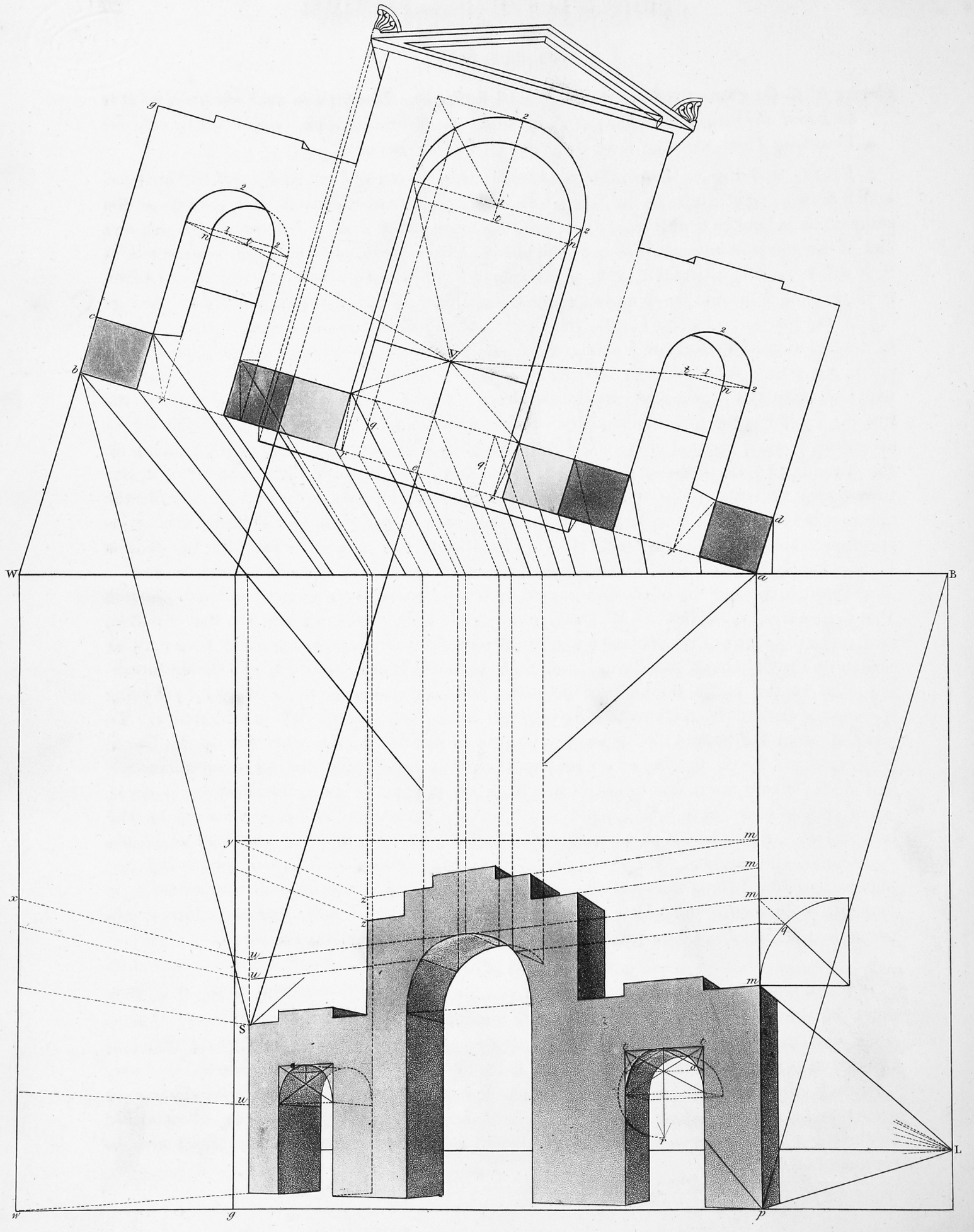
London, Printed for Samuel Leigh, 18 Strand, May 2nd 1814.

T.L. Busby scalp.

PLATE 16.



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T.L. Busby sculp.

PLATE XVI.

Having given the Plan of a Park Entrance, with its known Elevation, to shew how the same is to be drawn in parallel and oblique Perspective; the oblique one being performed by only one Vanishing Point, the other being at an impracticable Distance.

FIRST, to delineate the parallel view from *a*, *b*, *c*, *d*, the seat or plan, find the centre *e*, which draw at right angles to the line *a*, *b* (this view being intended to be seen direct); set the compass on *a*, and extend it to *b;* then, with the distance, describe a curve at S, keeping one foot of the compass on *a;* then, from *b* to S, also describe a curve, and where they intersect, as at S, it will form an equilateral triangle with the lines S, *a*, *a*, *b* and *b*, S, which is the greatest angle, or the nearest point that we should approach to the object, it being an angle of sixty degrees: let *a*, *b* be the line of projection for this view, and to which draw the dotted visual lines *r*, *r*, *r*, &c. in the direction of S, the station point; then draw the same perpendicular to the line *a*, *b*, from *r*, *r*, *r*, &c. which will be the perspective proportion of the visible length and thickness of the wall seen through the gateways: for the elevation, set up the height of the known angle on the line *dg*, *cg*, for as the plane touches the plan it no way diminishes; describe the hither arches according to their original form, which is here a portion of a circle, as 1, 2, 1, 2, &c.; then for the introdus, or soffit of the arches, draw the lines 1, V, 2, V, &c. from their butments 2, 2, &c. towards the vanishing point V; then on *t*, *t*, *t* as centres, and *t*, *n*, *t*, *n*, *t*, *n* as radii, describe the opposite curves, which completes the arches: the Grecian pediment may be developed by inspection, which completes the lineal view of the park entrance in this position. For the oblique view, assume the station P, as has been observed, discretionally, but it is best to have a view through the opening of the distant gate, as it has a more lively appearance; draw the line P, *a* perpendicular, and the line W, B at right angles to it, then will W, B be the line of projection, and *a* the centre of the picture, considering the accompaniments, as a group of trees or other objects on the right hand, to balance it: drawing the line P, B parallel to *a*, *d*, will be the vanishing point for the visible thickness of the walls: but the vanishing point for the front *a*, *b* being immensely distant, compels us to have recourse to another method, which will appear. To proceed: draw the ground line P and the horizon L parallel to each other and to the line of projection; set up the heights on the principal line P, *m*, *m*, &c. and the intersecting lines *g*, *y* and W, X; then if the height lines between W, X and *g*, *y* are drawn to the vanishing point L, where they intersect at *u*, S, *u*, *u*, and *z*, *z*, will be their perspective latitudes; then if joined by *m*, *z* and *m*, *u*, &c. it will give the perspective declivity of the converging lines, and which is a most convenient method. For the portal of the carriage-gate, the lines are brought from the plan and produced along the soffit towards L, which gives its curvature. The extrodus of the foot-gate is obtained by the figures subjoined to it; *o*, *o* are points in the curves, and which are obtained by the lines *t*, *r*, *t*, *r*, at their intersections *o*, *o*, which completes the views.

OBSERVATIONS.

When arches are situated in a vertical plane parallel to the plane of delineation, they must be drawn strictly geometrical in the picture, according to their decreased dimensions, and in proportion to their distance from the picture; but when they are drawn as situated in planes oblique to the plane of delineation, they will then be ellipses, and vary from each other in proportion to their distances from each other. Stags' heads would be very proper to be used in the frieze or metopes, if an order were introduced, and surmounted on the top with a figure of Diana, the goddess of hunting; the gates or rails might also be composed of darts, &c.

PLATE XVII.

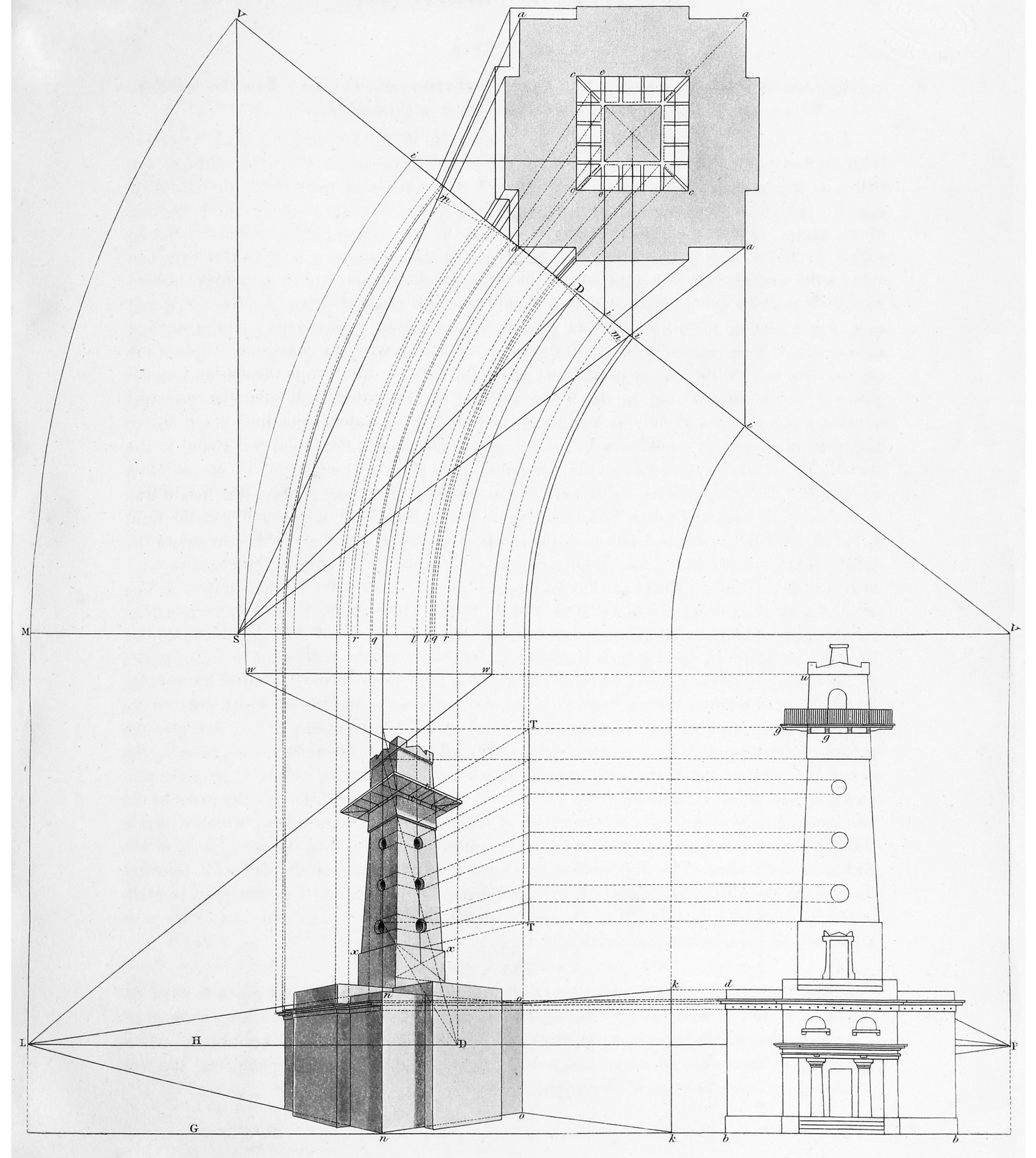
Having given the Plan and Elevation of a Shot-Manufactory (or a Pagoda), from thence to draw its pyramidic Tower and Gallery in Perspective.

LET *a*, *a*, *a*, *a* be the seat of the base or ground plan of the building, and *b*, *b* the elevation; and let *c*, *c*, *c*, *c* be the plano or projection of the gallery, laid down in the centre of the seat *a*, *a*, &c.; and let *e*, *e* be the ichnography of the cantalivers taken from the elevation *g*, *g*, &c.; also draw the projection of the cornice around *a*, *a*, in order to obtain the projection of the angles. For the perspective object, assume the station point S discretionally, but be sure to avoid its being in the plane of the adjacent and remote angles *a*, *a*, as in that case, one side of the tower would be a duplicate of the other, exhibiting only a dull monotony, instead of falling into the picturesque, which it should do. To proceed: draw the lines S, *a* and S, *a*, which include the angle of view; then on S, as a centre, describe the curve *m*, *m*, any distance, and draw the line V, V parallel to *m*, *m*, in contact with the contiguous angle of the seat *a*, then is V, V the line of projection; and if the lines are drawn from the station S to the plane of projection, parallel to the hither sides of the seat, they will give the principal vanishing points: extend the line V, S to M, and produce the intersecting lines *a*, *i*, *i*, &c. to the plane of projection; then from V, on the right hand, revolve the visual rays round to the line V, M, which carry down to the horizontal line H and ground line G, as has been explained. For the base or lower part of the building, you may produce the height line *b*, *d* to the principal angle *n*, *n*, and from thence draw it back to P, which will give the front *n*, *o*, *n*, *o*; or if the height is drawn from the intersecting line *k*, *k* to L, it will also obtain the height of the intersection of the visual rays *o*, *o*: for the tower, bring down the visual rays *r*, *r* to *x*, *x*, which will give its base; and for its top, produce the line *u* to W, W, the intersecting line of the top of the tower; then draw W, L and W, P, and where the lines form an angle will be the perspective height of the geometrical point *u*: produce the visual rays *q*, *q* to the sloping lines W, L and W, P, then at their intersections will be the points to draw the battering angles of the tower. For the gallery, carry on the line *g* of the elevation to the central intersecting line T, T; also produce the windows or loop-holes to the same line, from which draw to the vanishing point L, then the corresponding visual rays *l*, *l*, intersecting at *t*, *t*, will give the perspective positions of two points in the underneath part of the soffit of the gallery, the one at the body of the tower, the other at the edge of the planceer, which, if lines are produced to the point P, will give the perspective of the balcony. To get the place of the windows, draw a line from *t* to the centre of the dotted cross lines below, which will pass through their centres, then if carried round by the vanishing points to the other side, it will find them there also. The lines tending to D are vanishing lines of the diagonal, shewing, the same as the other method, how to get the balcony, but which is not so accurate. It is obtained by drawing a line from S to D, parallel to the diagonal line *a*, *c*: and thus are the principal parts of this inclined figure explained.

OBSERVATIONS.

The portico and palladian windows, with the Grecian door above, are given to shew the intention of the design, and for the student to add to the perspective drawing, thereby encouraging him in his pursuit, by giving him a foretaste of the result of his labours; and as an instance, that while he is applying rules upon seemingly uninteresting subjects, the same do extend to irregular or picturesque ones.

PLATE 17.



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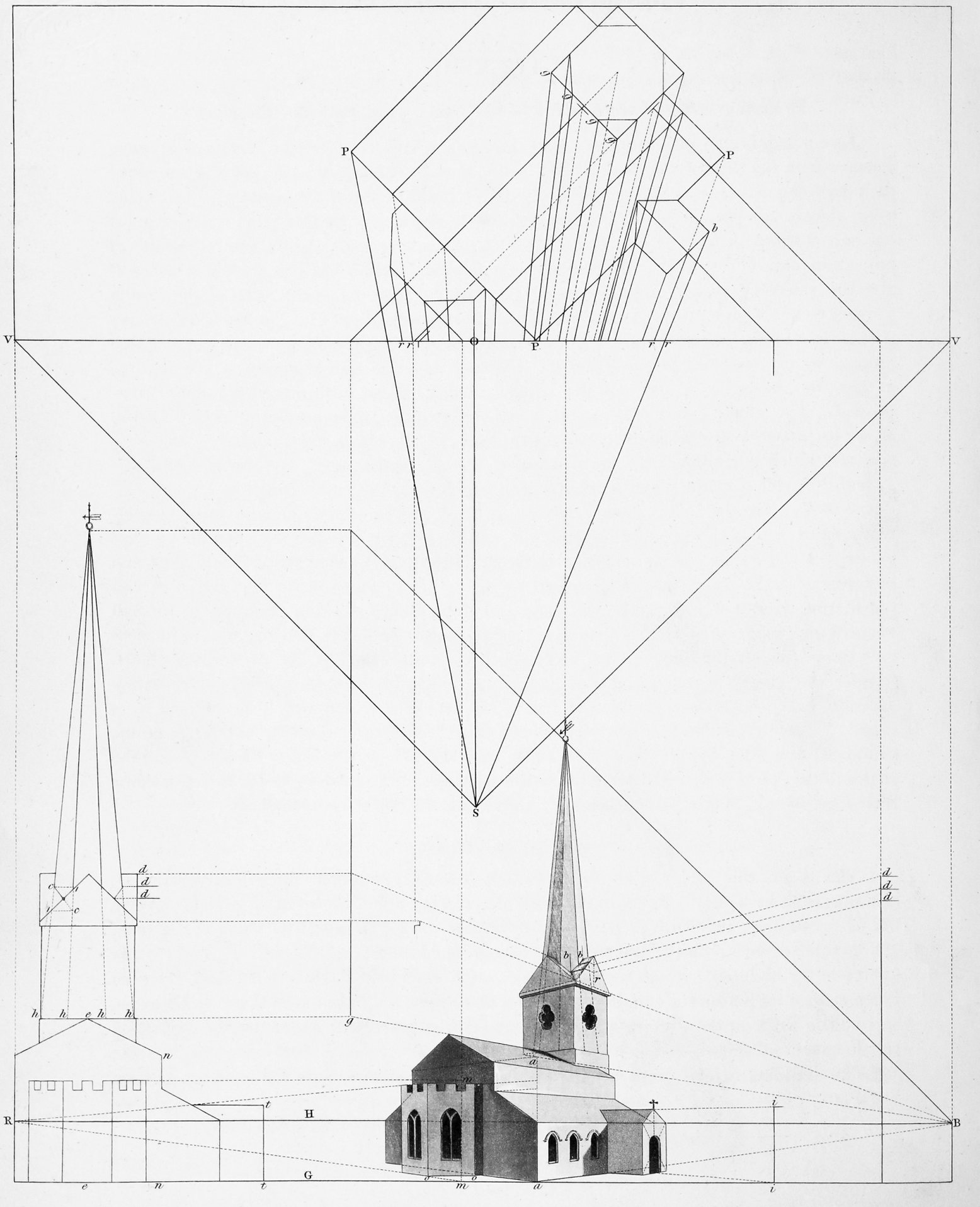
London, Printed for Samuel Leigh, 18 Strand, May 2nd 1814.

T.L. Busby sculp.

PLATE 18.



R. Brown del.t

London. Printed for Samuel Leigh, 18 Strand, May 2d. 1814.

T.L. Busby sculp.

PLATE XVIII.

To draw a Village Church in Perspective from a given Plan and Elevation.

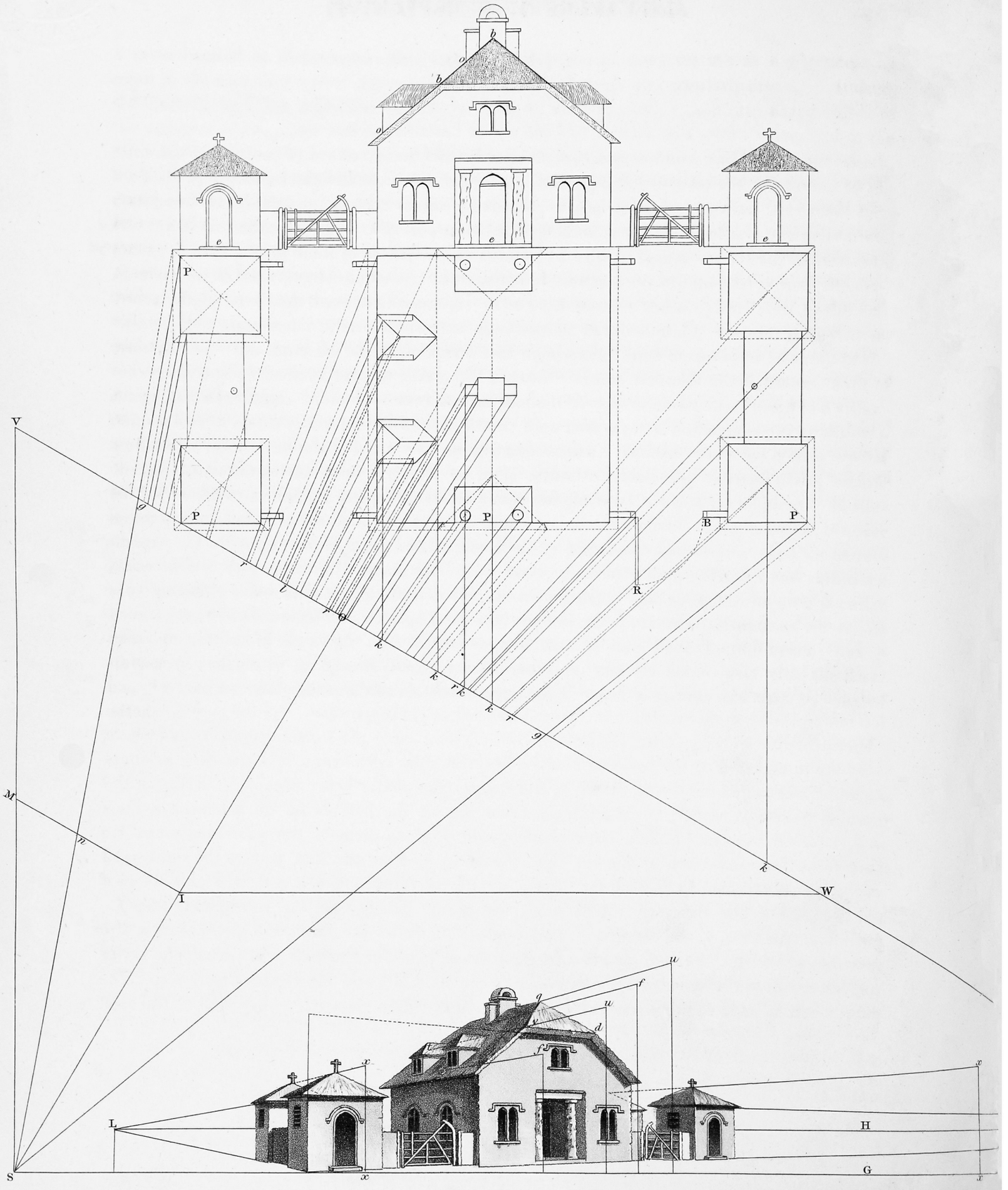
LET *p*, *p*, *p* be the plan, and let *e*, *e* be the given elevation: take the station S at some distance from the plan of the church, but take it so as to see four sides of the octagon spire; then draw the visual lines S*p*, S*p*, and the line S, O, to the centre of the picture; i.e. supposing other objects, as a parsonage-house or tomb-stones, to accompany it, this being considered but one part of the picture; produce the line V, V at right angles to the centre line for the line of projection, and the lines S V, S V parallel to the flank and altar end of the church, which will give the vanishing points: draw the visual rays *r*, *r*, &c. from the visible parts of the church towards S, which produce to the horizontal and ground lines G and H. For the body, or nave part of the church, take the height of the elevation and set it on the contiguous angle *a*, *a*, which produce to the vanishing points R and B. The roof over the aisle represents a straight line at the eaves, being in the plane of the horizon, which by that occurrence is already accomplished. The chancel end of the church is performed by producing the original height to *m*, *m*, its intersecting line, and thence drawn back to R, which being joined at the lines *o*, *o* (and which is acquired from the visual rays), completes this part. The roof is drawn from *g*, and the gable over the porch is taken from *t*, *t*, and set on the intersecting line *i*, *i*, and produced to R. For the tower, always let the inclined angles of the quatrefoil windows correctly point or tend to the vanishing points R and B, a figure which is too often drawn erroneously. For the spire and its lodgment on the pediment (a part apparently difficult), first find its butment in the elevation, which is done by taking the measures at the plan *g*, *g*, *g*, *g*, and transferring them to *h*, *h*, *h*, *h*, the elevation, and from thence drawing them up to the ball beneath the vane; then if the lines 1, *c*, 1, *c* are drawn parallel to the base where the spire cuts the pediment, the line *c*. will be its geometrical butment. For the perspective object, transfer the geometrical points *d*, *d*, *d* to the intersecting line *d*, *d*, *d*, which produce to the vanishing point R, to meet the central line of the pediment *r*, and which is obtained by a visual ray brought down from the plan above; then from B carry them up to the line of the pediment, and from thence draw them to R; then the perspective centre lines *b*, *b*, and the angles of the spire, which will come in contact with the lines vanishing to R, will determine their junction or points of concurrence: and thus is the object accomplished.

OBSERVATIONS.

The idea of this picturesque object (which is here represented upon true principles), was suggested by a similar figure in the work of a recent author, the spire of which is greatly out of proportion: its lateral pressure is at the top of the tower instead of being at the base, and its intersections with the pediments are also quite erroneous. Personal criticism is quite foreign to my intention; for all human productions must ever be liable to error, and I feel so much respect for the author's talents as an artist, that I must beg to be excused giving his name. In Uvedale Price on the Picturesque, I find my opinion supported, respecting the proportion and lodgment of spires; and as it may not be uninteresting here, I shall insert the passage: —" The building which gives most consequence to a village, and distinguishes it from

a mere hamlet, is the church, that forms its most conspicuous feature at a distance, and often in the near view a central point, round which the houses are irregularly disposed. Indeed, the church, together with the church-yard, is, on various accounts, an interesting object to the villagers of every age and disposition: to the old and serious, as a spot consecrated to the purposes of religion, where the living Christian performs his devotions, and where, after death, his body is deposited near those of his ancestors, and departed friends, and relations; to the young and thoughtless, as a place where, on the day of rest from their labour, they meet each other in their holiday clothes. Of the most conspicuous part of churches there are various forms; among which, none is perhaps more suited to a village than a tower with battlements. A tower, in its most simple, unvaried, unornamented state, always strikes and pleases the eye; it also admits of a high degree of ornament. The battlement is the simplest break to the uniformity of a mere wall; it is sufficient to give variety to the summit, without injury to its massiveness. On the other hand, pinnacles and open work, such as are seen in many of the towers of our cathedrals, are the most striking specimens of richness and lightness, both of design and execution. They are, however, on account of that richness, less suited to a village than to a city, yet will not bear to be simplified; for where a plain pinnacle is placed on each corner of a tower, the whole has a very meagre appearance. Indeed, when we consider what are the chief characteristics of the style of architecture to which they belong, plain, simple Gothic is almost as great a contradiction as plain, simple intricacy and enrichment. Battlements are not liable to the same objection as pinnacles, for their effect, though simple, is never meagre. The battlemented tower admits also of many picturesque additions, such as turrets rising above, or projecting beyond, the main body, most of which additions and variations were probably taken from similar ones in the ancient castles. The spire has its own peculiar beauty, though of a very inferior kind to that of the tower: yet there are situations where the spire, on account of its height and for the sake of variety, may have the preference; but as its beauty consists in its height, its gradual diminution, and its connection with the base, nothing can be more absurd than a short spire stuck upon a tower, and that by way of ornament."

PLATE 19.



R. Brown del.t

London Printed for Samuel Leigh 18 Strand May 2.d 1814.

T.L. Busby sculp.t

PLATE XIX.

Having given the Elevation and Plano of a double Cottage, appropriate for a Gardener and a Gamekeeper, from thence to draw its Perspective Representation.

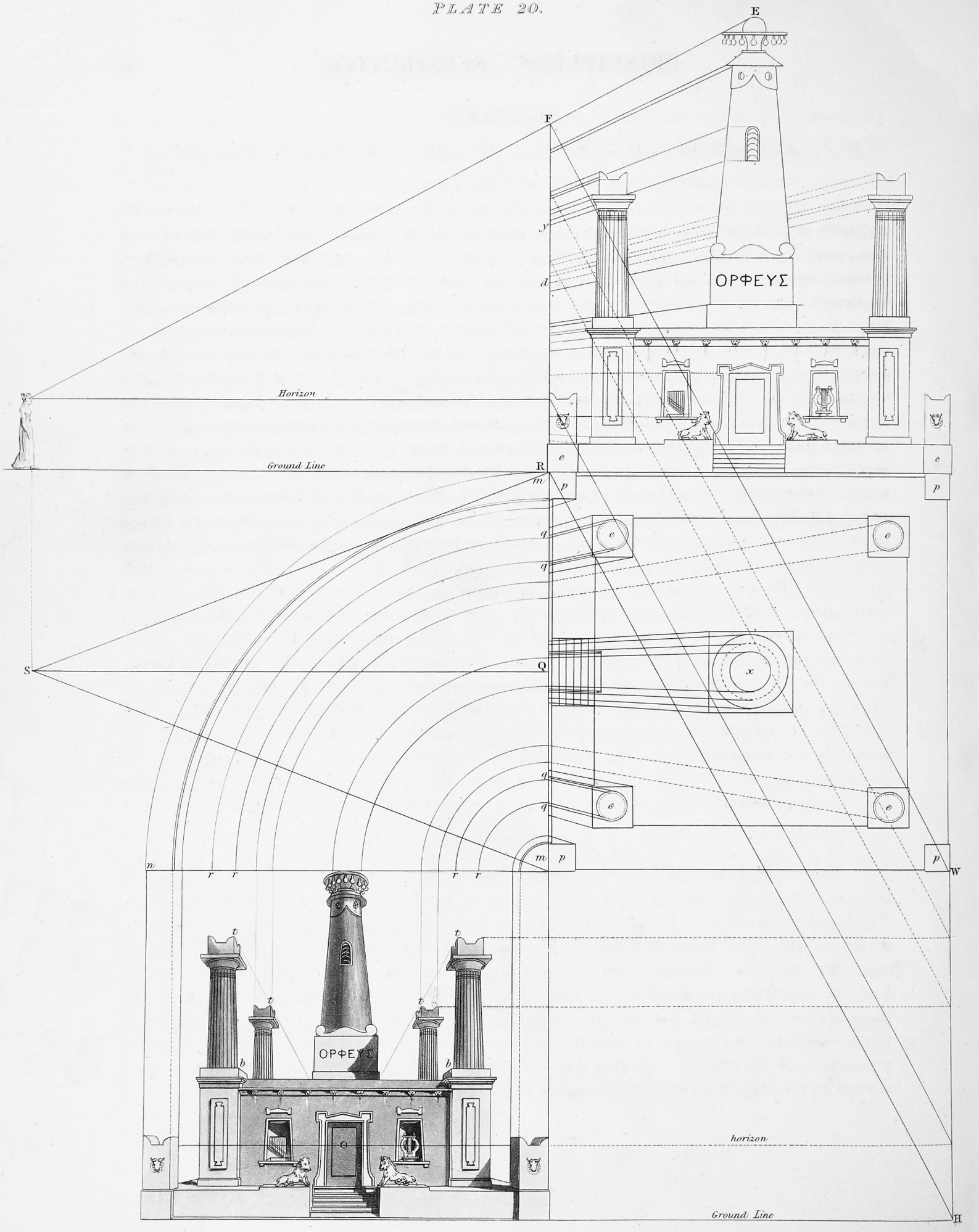
LET *e, e, e* be the elevation, and *p, p, p* the plano, or ichnographical projections of the walls and roof: take the station point S, as before, namely, at the most judicious point of view, then draw the visual lines *g, g* from S, which angle will embrace the whole cottage scene: next, bisect or divide the angle S, *g, g* into two equal parts, as is described by the line S, O, and draw the line of the picture *g*, O at right angles to it, to cut the contiguous angle of the seat; then for the vanishing point of the end, draw the line S, V parallel to the end of the cottage, which will give it at V. The vanishing point for the front is beyond the limits of the plate; consequently, the lines S, G and *g, g* will not meet on it; and from this circumstance another method is required to ascertain its distance: to do which, divide the length of the centre line S, O into two equal parts, then draw the line I, W parallel to the front, until it meets the line *g, g;* then will the length from O to W be half the distance to the right-hand vanishing point, which may be made use of by screwing on a slip of wood to the board, in a direct line with the horizon, if the drawing-board is not long enough to receive it. This point may also be found by another method, which is shewn on the left hand, and which is ascertained by drawing the line I, M parallel to the line of the picture; for as S, I is half the length of the line S, O, so is I, M half the distance of the line O, V; and, consequently, I, *n* is half the distance of *o, g:* this may also be done by taking one-fourth of the line S, O, and set off four times for the vanishing point from O, or any proportion whatsoever. To proceed with the perspective drawing, produce the visual rays *r, r*, &c. to the line of the picture, which is readily done by placing a pin in the station point S; also carry the intersecting lines *k, k*, &c. to the line of projection; then draw the ground line G and the horizon H parallel to each other, the height of the eye; and take the visual rays *r, r* and the intersecting lines *k, k*, and transfer them to it, which draw perpendicular to the ground line G, and produce the top and bottom of the hither office to the right and left hand vanishing points, which will give their perspective proportions. For the roof, set up the original heights on the intersecting lines *x, x*, which produce to the vanishing point L, and where they are intersected by the projection of the perpendicular visual rays, will give their summits or terminations, which, being drawn to the angles (the soffits being obtained), will give the form of the office roofs. For the principal roof, set up the heights on the intersecting lines *u, u*, which correspond to *b, b*, the elevation, and produce them to the vanishing point L; then from the intersection of the supposed visual ray *y*, draw the line *y, d* to the right-hand vanishing point; then by joining the lines *y, d* with the eaves and *q, y, q, d*, will give the roof required. For the dormers and chimney, set up the heights on the intersecting lines *f, f* (which agrees to *o, o*, the elevation), and produce them to L, which will give points at the intersections with the visual rays to complete those parts, and which will perhaps be better understood by the connected operative lines on the plate, than by any further description. The point *t* corresponds to the visual ray on the plan at *l*, which gives the remote end of the roof.

The curve marked R, B on the plan is the revolving line of the gate, which is shewn partly open, to give it a more picturesque effect, and to which doors and windows greatly contribute whenever they are so represented.

OBSERVATIONS.

To delineate a rude object, it is the most advisable method to represent ruins in the same exact outline manner as if they were quite perfect buildings, and then destroy the formal lines at pleasure, as is here done. For instance, let the object first be drawn, in pencil, strictly correct by rule, with every angle and boundary made perfectly straight and regular; then trace the rougher figure around it: for the rude object is by no means less under the governance of perspective than the perfect one, but only less indicative of departure from truth. The strict rules of perspective are unquestionably as requisite to be attended to, in describing old dilapidated buildings, as in depicting the most entire; for, without due attention to rule in their delineation, they may be preposterously represented. The best way to obtain the outline of a decayed edifice, is, first to sketch out its figure with a soft pencil, then to go over it with a harder one, as you would with pen and ink; which done, the soft lines may be taken out with rubber or bread, leaving the hard lines to mark its boundaries, and which is a very proper way in drawing from nature; for no lines ought to be seen at the angles, as the lights and shadows will fully represent the surfaces without them.

PLATE 20.



R. Brown del.t

London Printed for Samuel Leigh 18 Strand May 2.d 1814.

T.L Busby sculp.t

PLATE XX.

How to draw a Grecian Tomb, or Cenotaph, in a direct parallel Perspective Point of View.

LAY down the plan p, p, p, p, which are terminating angles on which tripods, or sarcophaguses are to be placed (for offering incense); and let c, c, c, c be the bases of the monumental columns around the sacred inclosure; and let x be the seat of the catacomb, or cemetery, and e, E, e the elevation: draw the line Q, S from the centre, on which take the point of observation, as at S, and from thence draw the visual rays from the seats of the tops and bottoms of the shafts of the columns to the plane of the picture m, m; then, on the hither point m, as a centre, revolve round the visual rays to the line m, n, which, if brought down perpendicular to the line m, n, will give the perspective widths and thicknesses of the different parts of the building, and which is shewn detached below. For the heights of the different columns, draw the ground and horizontal lines, as seen at the elevation, and produce the visual rays from the summits of the different columns to the eye of the spectator, and where they are intersected by the plane of the picture, as at R, F, it will give their perspective heights, and which is to be transferred to the drawing below: to connect the operation, draw a line from F to W; then if the perspective divisions between R and F are drawn parallel to the line F, W, it will give the required heights on the line H, W. For the perspective figure, draw the ground line and the horizon parallel to each other, and to the line n, W; then draw to o, the centre of the picture, the tops of the columns t, t, t, t, and the pedestals b, b, which will terminate their perspective altitude, according to their distance from the eye and from each other. For the perspective diminution of the columns, bring down the lines r, r, r, r, which is the size of their tops; and for the altitude of the shafts, take R, Y from the elevation, and set it up from the ground line, which will give the height of the nearest columns; and for the distant ones, take the height R, d and set it up in the same manner; then if the lines q, q, q, q, from the bases, are brought round and down to the pedestals, it will give the thickness of the bottoms of the columns, and, if drawn by the thickness of the tops, will complete the shafts required. The angles of the abacuses are drawn from the angles of the pedestal; and the column of the catacomb is performed by the plan x, as the other columns are; which completes all the necessary perspective description of this building.

OBSERVATIONS.

This sublime monument is consecrated to Orpheus, and appears to have been the pristine form of the Grecian sepulchres, according to the description given by Pausanias. The pandean reeds and lyre in the niches are emblems of his art; appropriate ornaments, which should at all times be studied. I have called this tomb sublime, although for that character, greatness of dimensions seems requisite; because, as Mr. Burke observes, in his Enquiry concerning the Sublime and Beautiful, " Whatever is fitted in any sort to excite the ideas of pain and danger, that is to say, whatever is in any sort terrible, or is conversant about terrible objects, or operates in a manner analogous to terror, is a source of sublime; that it is productive of the strongest emotion which the mind is capable of feeling;" and which must always be the case in viewing the mansions of the dead.

PLATE XXI.

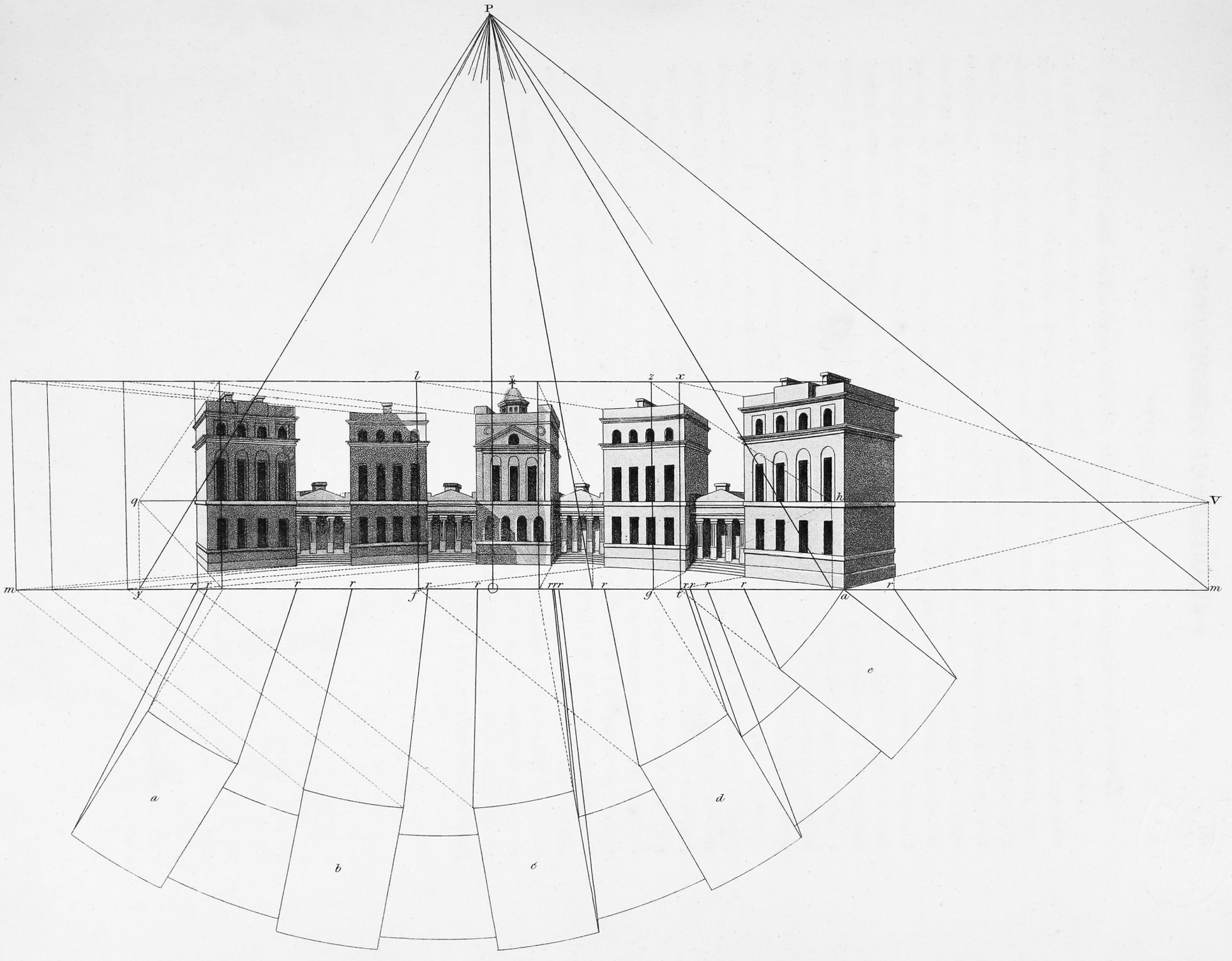
How to draw a Crescent or Paragon in Perspective, or any concave Object whatsoever.

DRAW the seats of the different buildings, *a*, *b*, *c*, *d*, *e*, according to the curvature of the plan (which is any portion of a circle), and draw the line of projection *m*, *m* in contact with the contiguous angle *a;* or you may take the point of view which is at P, and let fall the perpendicular line P, O; then draw the line of projection at right angles to it, which will likewise give the line of projection for the picture: draw the visual rays *r*, *r*, *r*, &c. to P, the point of view, which, if projected perpendicular to the line *m*, *m*, will give the perspective proportional widths of the different buildings. To get the curve of the building *e*, produce the intersecting line *t* to the line of projection, and draw the line P, *m* from the point of view parallel to the intersecting line *t*, which will give its vanishing point: carry the line *m* to the horizon V, then produce lines from *a*, *t*, *x*, *n* to the vanishing point V, and where they cut the vertical angles of the building, will give their perspective points. To find the latitudes of the angles of the building *d*, produce the intersecting line *g* to the ground line; then if a line is drawn from the station point P parallel to it, to cut the ground line, and from thence projected to the horizon, it will give the vanishing point for the line *g*, which is at *h;* then if you draw *g*, *z* to *h*, it will give the visible side of the building *d*. To get the other angles, draw the line *f* parallel to the line *t;* then the vanishing point V will be a vanishing point for the lines *f*, *l*. To get the perspective situations of the top and bottom angles of the buildings *c* and *b*, proceed by the same method, which is here very simple, the required operative lines being, as is evident on inspection, so very few in this picture. To get the residence *a*, produce the line P, *y* from the station point parallel to the side of the house *a*, then if projected to the horizon *q*, it will be the vanishing point for the visible side of the building *a:* the other points are obtained by drawing the lines to V, and which will be the points where to draw the top and bottom curves of the crescent, which must be carefully traced by hand, as the smallest error will be visible in those outlines. The curves of the cornice, windows, and corridor, are obtained in the same manner; but the student will find those curves nearly sufficient to guide his hand in drawing the other parts.

OBSERVATIONS.

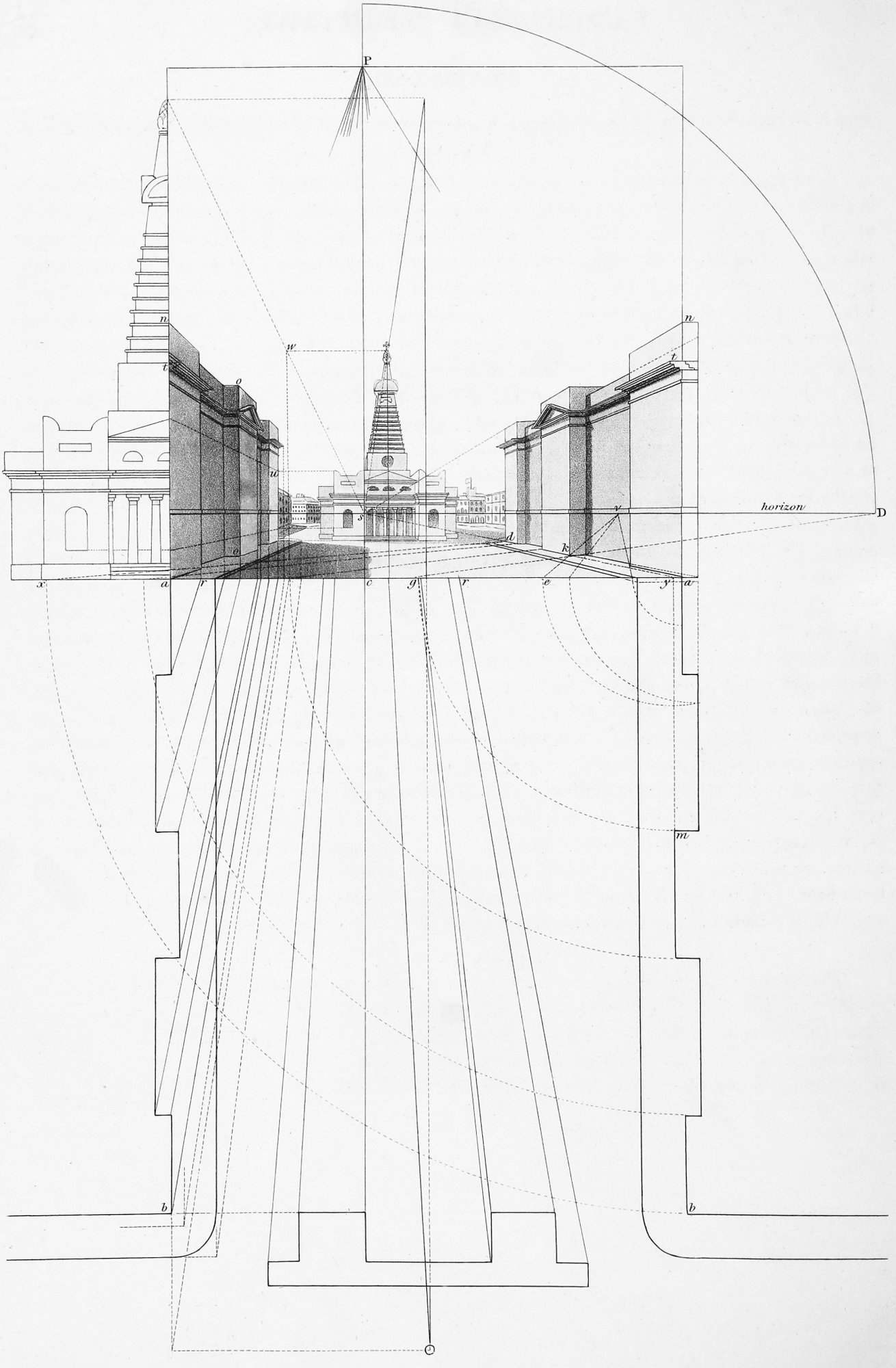
In this plate I have, for convenience, deviated from my usual method, that of drawing the plan above and bringing the rays down for the perspective drawing; but this will be seen to be precisely the same in principle as the other method, if the centre line P, O is conceived to be raised perpendicular to the surface of the paper, above the ground line, and the portion of the paper below the ground line is folded under, making a right angle with the surface of the paper above and below it. The best way to avoid crippling the curves, is, to draw them in pencil through the apertures or voids between the houses, and to recline your head on the paper and look along the curves, as the smallest irregularity will be seen by this method. Remember, there are always as many vanishing points as there are sides in a building or buildings, unless any two or more are parallel to each other; in that case they have one common vanishing point; according to a definition already given, all lines parallel to each other have the same vanishing point: this must always be kept in mind.

PLATE 21.



R. Brown inv.t

PLATE 22.



London. Printed for Samuel Leigh, 18 Strand, May 2nd 1814.

T.L.Busby sculp.

PLATE XXII.

How to draw a Street or Vista in Perspective, terminated by a Church in the Egyptian Style of Architecture.

LET *a*, *a* be the nearest end of the street, and *b*, *b* the farthest: take the point C, which is generally one third the width of the picture (that is, from *a* to *a*), and the distance P is usually the width of the picture set from *c*. In parallel perspective, if the point of view were taken in the middle of the street, and the houses on each side were uniform or corresponding, the one side would just reflect the other, and, of course, would be unpicturesque: therefore, it is usual to take the view in this proportion. Draw the visual rays of the different projections included between *r*, *r*, to the ground line of the picture *a*, *a*, in the direction of P; then draw the horizon parallel to the ground line, the height of the eye, and where the line P, C intersects it, will be the centre of the picture, and which is at S. To this draw the lines *a*, *n* and *a*, *n*, which will give the perspective inclination of the top and bottom of the houses on each side of the street; and where the lines in their direction to S cut the vertical angles, as at *o*, *o*, *o*, produce the return of the walls parallel to *a*, *a*, which may be drawn with the square from the edge of the board. For the cornice, form a geometrical section of the mouldings, as at *t*, *t*, which likewise draw to S, then if returned at the angles, will complete those parts. The perspective breadths of the houses on the right hand has another method applied to them; that is, performing them without the plan, but the plan is subjoined for demonstration. To proceed: let it be required to get the whole length of the side of the street, which is from *a* to *b*; to do which, take the length of *a*, *b*, and set it along the ground line from *a* to *x*, as the dotted curve line shews; then take the distance of the picture from C to P, and set it from S to D along the horizontal line; then, if a line is drawn from *x* to D, it will give the perspective length of the street, which is at *d*. This is a good method, but being impracticable, in many cases, on account of the great distance, I shall shew its application another way, which can be universally practised. For example, suppose the lines *g*, D and *y*, *d* to give the perspective point of their intersection *k*, as before, by the whole distance; now if you find half the distance from *y* to *g*, as at *e*, and half the distance from S to D, as at V, it will give the same point at *k*; or any portion may be taken whatever, as a third, a quarter, and so on. For the church, draw the elevation to S, then the intersections of the lines from *u*, W at the visual rays, will give the height of the church and pyramidic tower, and which completes the view proposed.

OBSERVATIONS.

The multiplicity of lines in perspective plates sometimes creates disgust; but it should be recollected, that every line which contributes to the completion of the drawing, must be retained, that the same may be seen and done by the student. But in his performance, part of the lines composing the object may be put in ink, and the operative ones rubbed out when they become intricate, or when the object required is obtained, thereby avoiding all confusion.

PLATE XXIII.

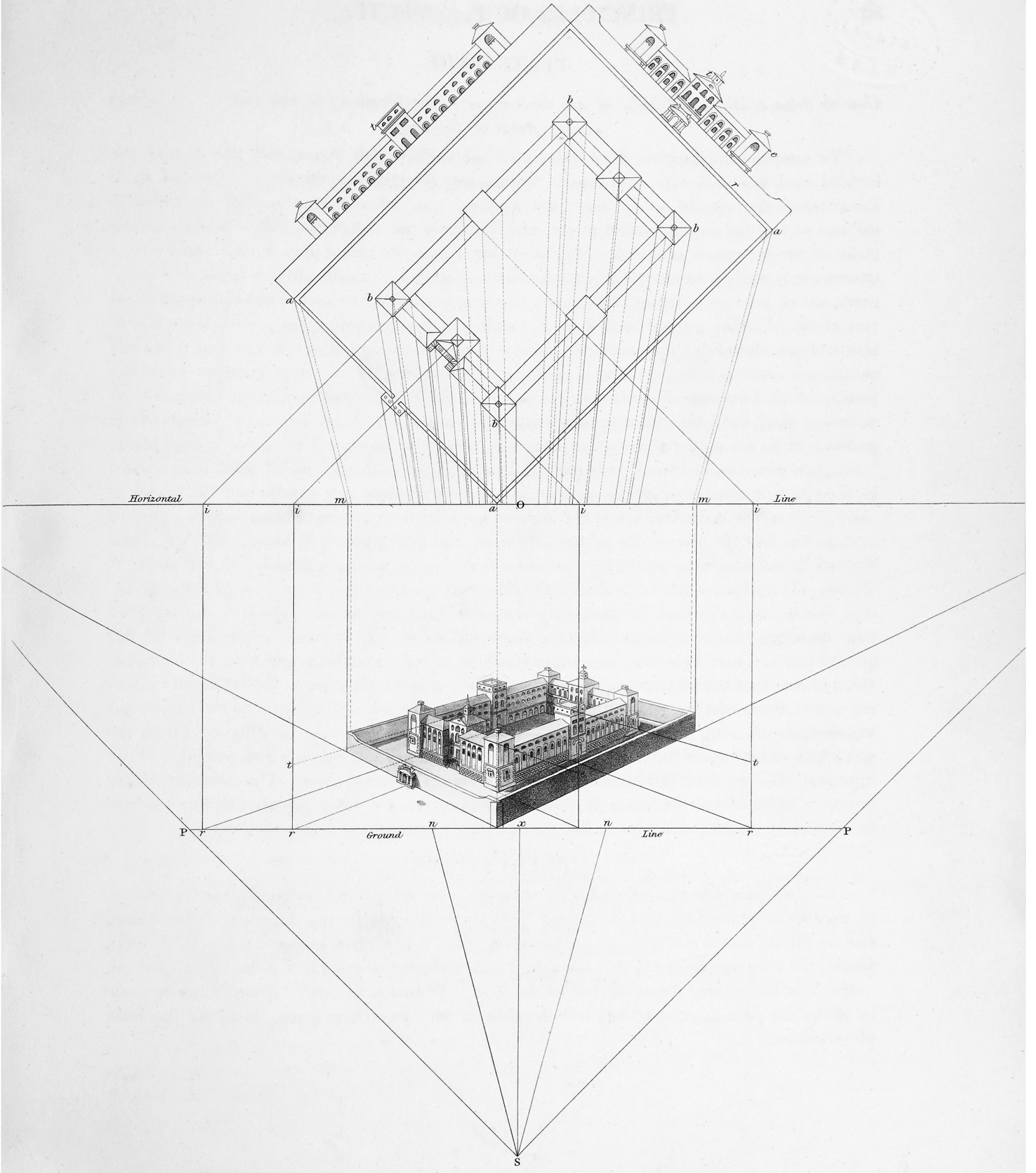
How to draw a Bird's-eye View of an Asylum, or a Fortification, or any inclosed Buildings having Areas or Gardens.

To prepare the picture, draw the outer or boundary wall a, a, a, and the plan of the building and roofs b, b, b, b, in the space within, and from thence draw the front and flank elevations as they would appear above the boundary wall; then take the point S, which is the seat of the eye on the ground plane, and to it draw the visual rays. The position of the plane of the picture is obtained in the usual way: here the visual lines must be drawn from the remote as well as the nearest objects; for as the spectator is considerably elevated, as on some precipice or pile of building, we cannot say how much will be seen until the operation is performed. For the ground line, draw it parallel to the horizontal line, the distance downwards of the altitude of the spectator: here it is taken centrical between the seat S and the contiguous angle a, to explain another property. In progression, we next find the vanishing points, which are obtained by drawing the lines S, P and S, P parallel to a, a, the side and front of the building, until they meet the horizontal line, but which is here beyond the limits of our plate: now on account of these points being very frequently inconvenient to find in large plans, I have here given an extremely easy method how to ascertain them, which I shall demonstrate. If the line S, x is half the length of the line S, O, the distance n, n will be half the length of the line m, m; for as the line n, n is the midway between S, O, it must evidently give a picture on that line half the size of one on the line m, m; and from hence it follows, that P, P is the distance of the vanishing points for a picture on the line n, n: consequently, if x, P and x, P are doubled on each side of the centre O, they will give the vanishing points for the building, which may be proved by producing the lines until they meet. To effect the perspective drawing, produce the intersecting lines i, i, i, i to the horizon, which draw to the ground line r, r, r, r; then, for the hither staircase tower, take the height from the elevation r, e, and set it on the corresponding intersecting line r, e, which draw to the left-hand vanishing point; then, where it intersects the corresponding visual rays, return it to the right-hand vanishing point. So, for the middle tower and governor's house, take the height t, t from the elevations and set them on the corresponding intersecting lines, below which produce, to the right and left, vanishing points, which will complete the different parts. The infirmary, in the distance, being in a direct line with the governor's house, the same intersecting line answers for it; and by working the lines in this manner, the whole will be accomplished.

OBSERVATIONS.

It must always be remembered, that whatever intersecting line or original plane is produced to the line of projection, that it serves only to obtain heights in the direction of that plane, and which are transferred through the vanishing point to any plane in contact with it. For example, the intersecting line r, t, on the right hand, is the intersecting line of the tower, and the farther one in the same direction, but for no other. Drawings of this kind may either be made in oblique or parallel perspective; but the oblique one, as is here given, is by far the most picturesque.

PLATE 23.

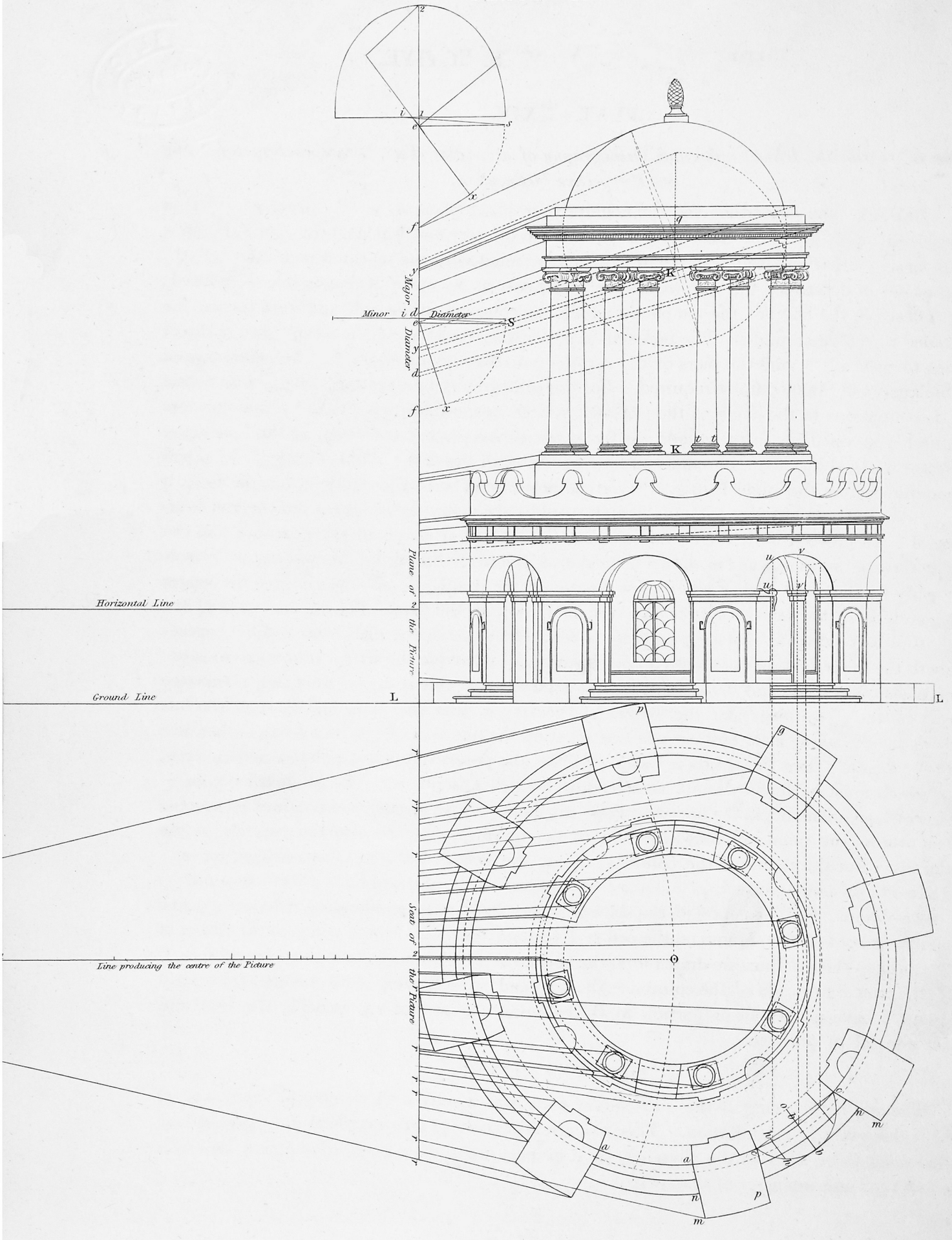


R. Brown inv.t

London Printed for Samuel Leigh 18 Strand May 2d 1814.

T.L. Busby sculp.t

PLATE 24.



P. Brown Inv.t

London Printed for Samuel Leigh 18 Strand May 2d 1814.

T.L. Busby sculp.t

PLATE XXIV.

How to describe the Ichnography and Orthography of a circular Temple, preparatory to making its Perspective Delineation.

BEFORE you describe the ichnography or plan, place a small piece of horn or parchment with gum, on the centre *o* (which can be very easily taken off when the plan is completed), otherwise the centre will get so perforated with the repeated revolutions of the compasses in describing the various concentric circles, as to make it impossible to proceed; then describe the body of the temple on which the columns are placed, and from thence the arcade or passage around it. The pedestals *p*, *p*, dividing the steps of the temple, are in direct lines to each other, and the piers of the arcade *a*, *a*, &c. are all tending to the centre *o*, and which gives the ichnography required. For the orthography or elevation, draw the base line L, L contiguous to the angle of the pedestal *p*, according as you want to shew more or less columns and openings in the arcade: as for instance, the present elevation, in the position of the line L, L, shews four columns and four apertures in the arcade; but if the line L, L had been drawn from the angle P to *g*, the vertical projections being drawn at right angles to it, it would have shewn but four columns, which would have made them appear thin set and overloaded. To proceed with the elevation: produce the hither angles of the pedestals and the ends of the steps, as *m*, *n* and *m*, *n*, in a vertical direction to the line L, L; set up the steps proportionably by the given scale, which draw parallel to the line L, L, then it will give the length of the steps at the intersections of the vertical lines from the plan. For the curvature of the arches (a part which is seldom drawn true), describe an arc on the plan from *o* to *c*, *c*, agreeably to the known rise of the arches in the elevation; then divide the arc *c*, *c* into what divisions you please, say four, and draw them at right angles to the line *c*, *c*, and from thence produce them to the elevation; take the length of the line *b*, *b* at the plan, and set it on the line *v*, *v* in the elevation; also the line *h*, *h*, and set it on the line *u*, *u*; likewise take the other line in this manner; then the points *u*, *v* above will be the points through which to trace the arch, and which must be done by hand, as no compasses will describe it. The geometrical appearances of the ornaments in the breast-work of the gallery or paradrome, are obtained by spacing them around the plan and drawing them to the elevation; as are also the capitals of the columns. For the shafts of the columns, divide the height *k*, *k* into nine equal parts, and give two to the entablature *k*, *q*, and one to the bottom of the shaft, as *t*, *t*. For the diminution of the columns, find the centre of the shaft *t*, *t*, which draw perpendicular; then set up five times the height of the column on the centre line from the base, which will give the vertex of the column; then if lines are drawn from the bottom of the column *t*, *t* to the vertex, it will give the true diminution of the column at the top: and by the same point flutes are very readily drawn. I have given this proportion to the columns and entablature, as being the best and most general in practice.

OBSERVATIONS.

The original drawing of the subsequent plate was wholly worked up with sepia, and of which that plate is an imitation. This is a useful colour to artists, where only one colour is intended to be used in the drawing, as it quickly produces a good effect, from its warm mellow tints and intensity of shadows.

PLATE XXV.

How to draw a rural or oracular Temple in Perspective, appropriate either for a Park or Garden.

THE plan and elevation from which the measures are to be taken for this beautiful rotunda, are in the annexed plate, and to which I shall refer in making the perspective delineation: but I must observe, before we proceed, that the first and most essential consideration towards making this an agreeable figure, is, a proper choice of distance; for if the point of view is taken too near, the farther columns will be considerably distorted, as a great portion of their height will be lost; and if taken too far off, the curves of the cornice will then be rendered too tame, and the graceful contour of the lines will be very much contracted, For this object, the station point is out of the plate, at twice the distance of the length from 1 to 2, and to which the rays are drawn, as are seen at the ichnography and orthography. To proceed: take the vertical lines of the temple, as the piers, pedestals, &c. from the rays r, r, r, r, and transfer them to the paper for the perspective drawing; then for the height and curvature of the cornice below the gallery in the perspective object, first draw a base line from a at right angles to the line a, b, and take the height from L to u, u at the elevation, and mark it on a centre line in the perspective drawing; then if a line is drawn through the centre of the line u, u until it touches the extremities of the cornice (and which is found from the plan), it will give the major and, u, u, the minor diameters of the ellipsis, which curve is trammelled round by the 21st geometrical problem. For the soffit of the entablature, take the height at the elevation L, d, d, and set it on the centre line d, d in the perspective drawing; then take the longer diameter of the ellipsis from the plan, and proceed as before directed. For the crown moulding of the cornice, take the height L, y, y from the elevation, and set it on the perspective drawing; then find the longer diameter, also the planceer and bed-moulding of the cornice, by the plan, as this will be a sufficient guide for all the other curves, and which, if the student has not judgment enough to trace, little will be done by such a hand. For the dentals, find the perspective point of z in the orthography, and transfer it to z in the perspective drawing, which is the point the dentals converge to. For the dome (which here appears an ellipsis), take the height f, f from the elevation, and transfer it to the perspective drawing, which is its major diameter; and for the minor one, draw a line through the centre of the major one at right angles; then draw the line e, x at right angles to the perspective centre line of the circle; and, on e as a centre, describe the curves x, s, then will e, s be the perspective semidiameter of the apparent circle, but not of the ellipsis. For the perspective semi-minor diameter of the ellipsis, take the length from 1 to 2 in the compasses; then place one foot of the compasses on s, and with the other foot mark the line of the minor diameter, as at i; then draw the line s, i, and where it crosses the major diameter, as at . , will give the length of the semi-minor diameter; which, if the length is taken from . to s, and transferred on each side of i, it will give the minor diameter: which figure, for clearer conception, is shewn above, the dome being supposed higher up.

OBSERVATIONS.

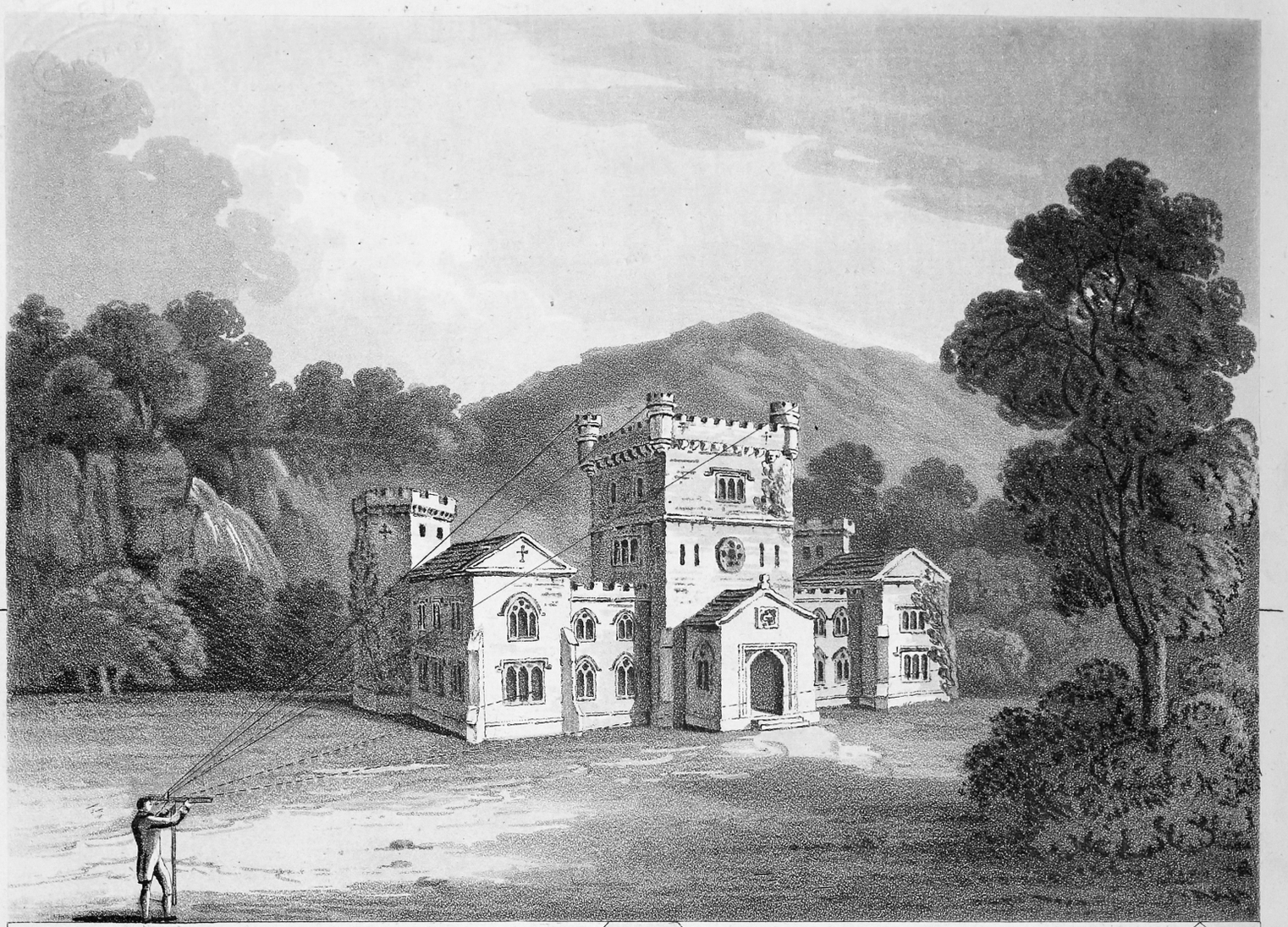
This perspective drawing, for clearer inspection, is enlarged with the proportional compasses, which instrument will give the perspective proportion of every curve, without the back visual lines, in the elevation, and which application will be explained in a subsequent plate.

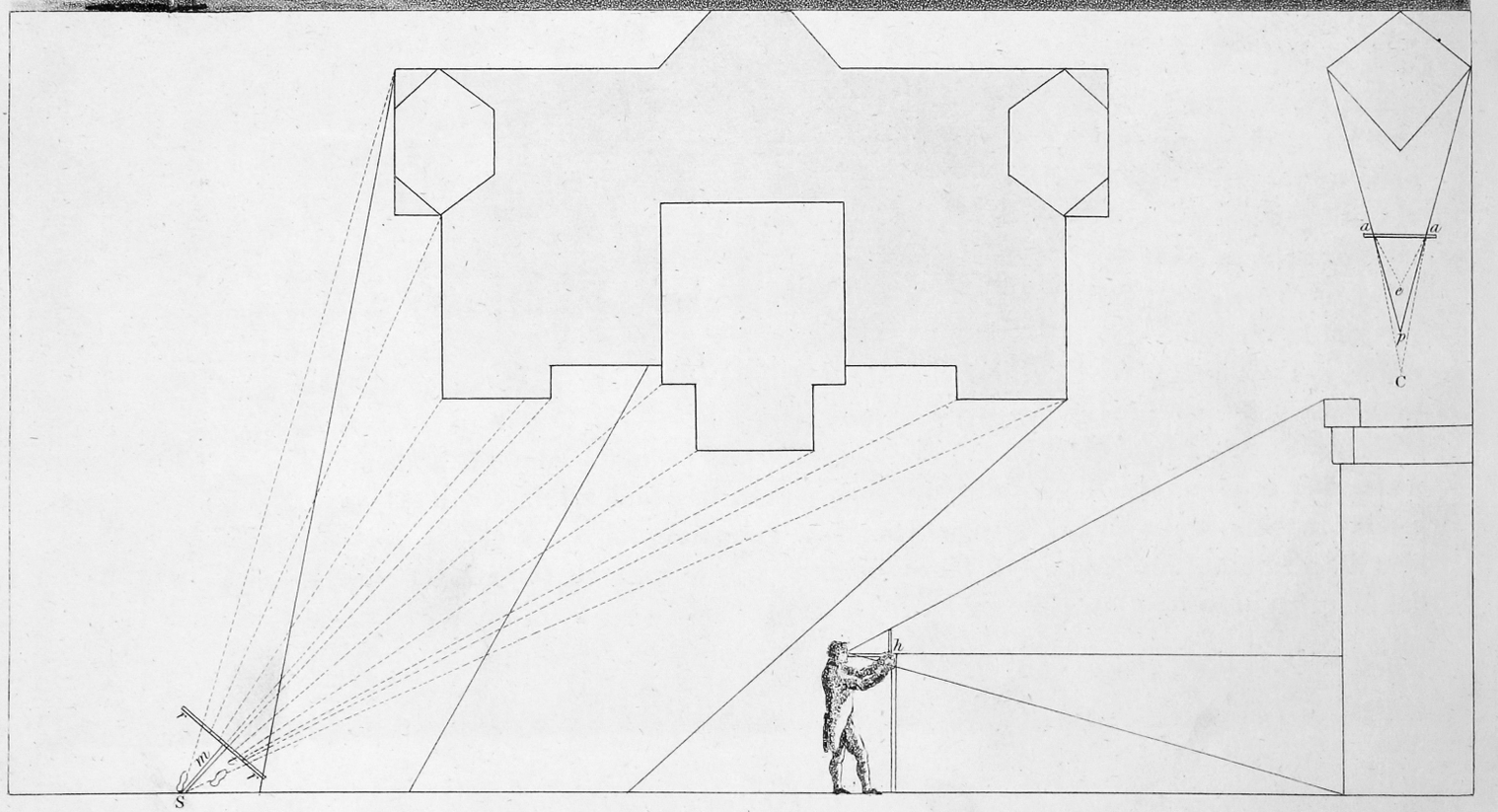
PLATE 25.

R. Brown. Pinx.t

T.L. Busby. Sculp

London. Printed for Samuel Leigh. 18 Strand. May 7th 1824.





R. Brown pinx.t

London, Printed for Samuel Leigh, 18 Strand, May 2d 1824.

T.L. Busby sculp.t

PLATE XXVI.

A practical Method of taking Views from Nature.

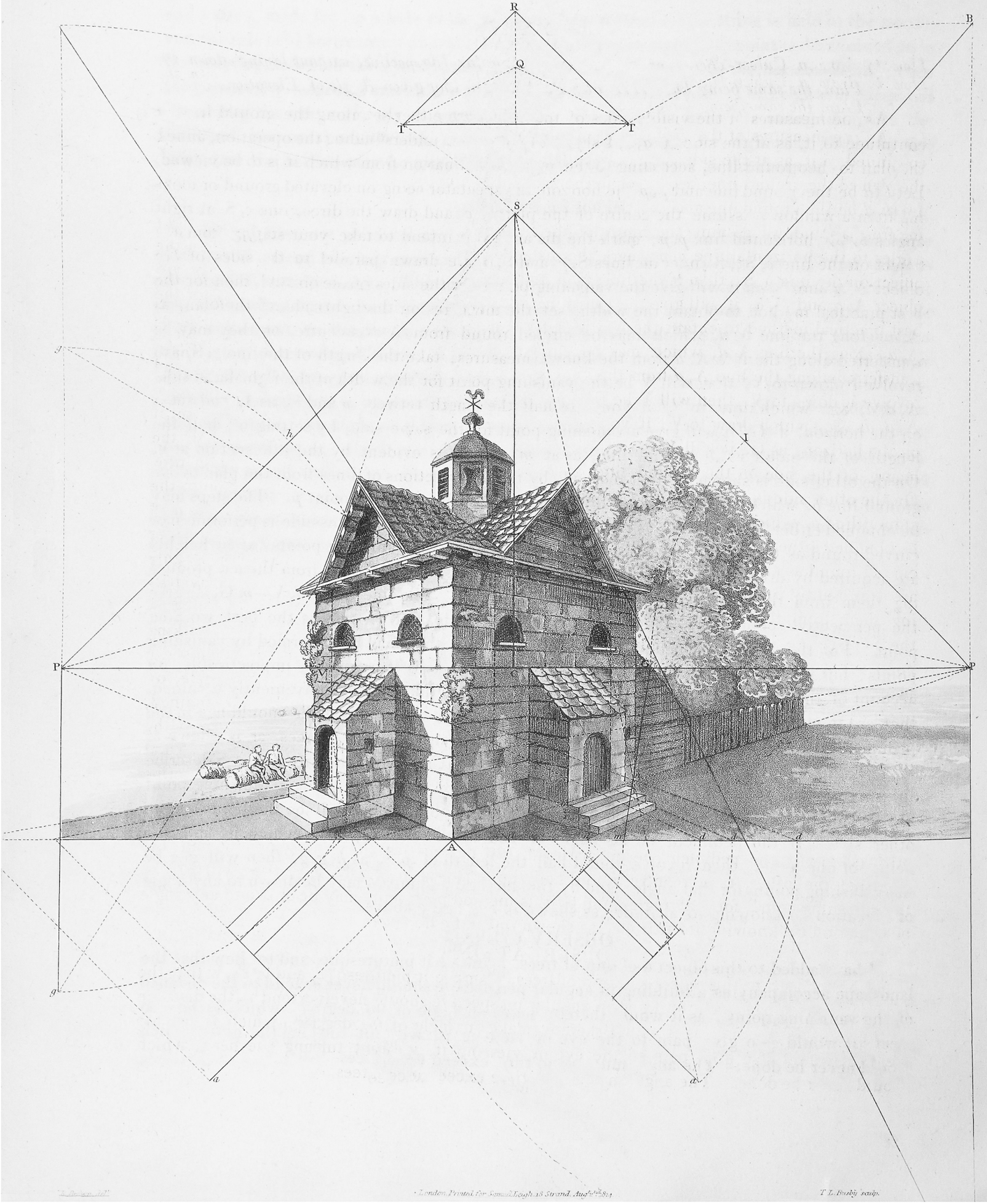
SUPPOSE the castellated building in the annexed plate, with its scenery, to be the view necessary to be taken, and which view is supposed a view in nature. First, fix upon a station where the castle and scenery will have the most picturesque effect, which may easily be ascertained by walking round the building; when this is done, determine upon the width of your drawing, as the picture may be made to whatever dimension you please, from the same point of view, by placing the line of projection nearer or farther off; but it is inconvenient, in taking views, to have the operative line of your picture beyond the reach of your arm: if your drawing is required to be larger than this distance will admit, it is very easily enlarged from your sketch (when at home), either by the proportional compasses, or by reticulated lines. Indeed, this is the general plan which artists adopt. When you have determined your station and the extent of landscape you mean to bring into your picture, take a rule or slip of wood, as *a*, *a*, and on it cut two notches for the width of your picture, as at *a*, *a*, to which tie the two ends of a string, then hold up the rule, at arm's length, in a horizontal position before your eye, the other being shut, and gather up the loop of the string, and look along the triangle *e*, *a*, *e*, *a*, to see if the lines *e*, *a*, *e*, *a* point to the extremities of your assigned view: then if the angle is too great, by taking in too much, lengthen out the string until the angle will bring in the desired objects, as at P: but if it was lengthened out more, as at *c*, it would not take in the required objects; therefore *e*, *a*, *e*, *a* is the decided angle of view, P the station point, and *a*, *a* the line of proportion: next, take a stick and fix it vertically in the ground the height of your eye and the distance of the line *a*, *a* from P; then take the rule *a*, *a*, and tie it in a horizontal position at the top end of the stick, which is seen before the artist in the view above; then if you prop out the loop as seen at *m*, it will complete the apparatus. This being done, point a rule from the angle, as is shewn at S in the seat below, progressively towards the visible angles of the castle, and mark them on the rule *r*, *r*, which divisions are the perspective widths of the buildings. Trees, &c. may be taken in the same manner, and transferred to the drawing. For the heights of the different parts of the building, draw a line on your paper where you would suppose the horizon will pass; then, for the hither angle of the tower, shut one eye, place the other at S, and slide up the pencil against the horizontal rule, as at *h*, and over the corresponding visual line *t*, until you see the top of the pencil and the top of the tower in a right line with each other; then mark the height from the horizontal rule, and set it from the horizontal line on the paper upwards, which will give its perspective point. For the base, or ground point of the same angle, proceed in the same way, by marking its depth with a pencil from the horizontal piece downwards, and setting it to the horizontal line of the picture downwards. Also, take the other angles by the same method; but, for facility, when you have obtained the heights of the extreme angles of the tower, and joined them by the top lines, they may be produced to the horizontal line, and where they intersect it will give the vanishing points, to which all lines will converge that are parallel to them, and which is the whole process. The places for windows, &c. are easily found after the general outline is obtained. There is another way of applying this method in taking views, but it is very uncertain; that is, by having a straight rule with feet and inches marked on it,

and a string made fast to a hole in the middle; then the end of the string is held in the mouth, and the rule held horizontally at arm's length, and a certain regulating point is determined on in the building, to which the eye and string direct, and which is seen in the horizontal line; then the perspective measures or widths will be seen in the horizontal rule. The heights are acquired by turning the rule vertically or perpendicularly, observing to keep the string direct to the imagined horizontal line which is supposed to pass through the regulating point; by this procedure the heights may be marked on the rule and transferred to the drawing.

OBSERVATIONS.

Here I have not premised any particular angle for the view, because to fix upon an angle that would extend to every case as being the best, would be impossible, for different subjects require different treatment. The size of an object makes no difference as to the angle of view; for the smallest figure, by being placed too near to the eye, may form a great angle, and be very unpleasant to the eye in viewing it. Objects may also be placed too near the eye for a satisfactory observance of them. A faithful representation of a place should comprise no greater extent than the eye can agreeably embrace at one view, or that can be pleasingly and satisfactorily viewed from one point alone; which must necessarily confine the extent of matter, and, of course, the angle of vision, to some certain limits.—This plate is a coloured copy of the original drawing, which was done in neutral tint, composed of indigo, lake, and sepia. After the pencil outline was obtained, the shadows of the mountains, trees, and fore-ground were touched up and brought into effect, then worked over with softer tints, by which the drawing was completed. There are various other greys made by compounding colours, which will be mentioned in directions for colouring at the end of the work.

PLATE 27.



London, Printed for Samuel Leigh, 18 Strand, Aug.st 1st 1824

T. L. Busby sculp.

PLATE XXVII.

How to draw a Culver-House, or an Aviary, in angular Perspective, without laying down the Plan, the same being known; as also Pediments at any given Angle of Elevation.

As the measures of the visible sides of the object are either set along the ground line or continued to it, as at the side A, *a*, *b*, I shall, for the better understanding the operation, annex the plan to the ground line, according to the angle of inclination from which it is to be viewed. Let *b*, *d* be the ground line and *p*, *p* the horizon, the spectator being on elevated ground or looking from a window: assume the centre of the picture *c*, and draw the direct line *c*, S at right angles to the horizontal line *p*, *p*; mark the distance you intend to take your station from the object on the line *c*, S; then if the lines S, *p* and S, *p* are drawn parallel to the sides of the object A, *a* and A, *a*, it will give the vanishing points for the sides of the object: then for the best practical method to obtain the width, set the measures on the right side of the plan, as A, *a*, along the line A, *d*, which may be circled round from A as a centre, or they may be transferred along the line A, *d* from the known measures; take the length of the line *p*, S, and revolve it down to V, then will V be the vanishing point for the width of the right-hand side, A, *d*, *d*, &c. which draw to V: if you take half the length between *p* and S, as 1, and set it on the horizon, as G, it will give a vanishing point for the same side, by setting off half the length of the side on the ground line, as at *m*, which is evident by the intersection at *n*. On the other side is shewn another method, by the intersections of lines from the plan to the ground line *b*, which are from thence drawn to the regular vanishing point *p*. The steps may be obtained either by intersections of lines from the ground line, as this side is performed, or curved round as the side A, *d*, and from thence drawn to the vanishing points: their heights are acquired by dividing regularly the angle at the porch, as 1, 2, 3, and from thence producing them from the vanishing point, as the lines shew. The lines *a* S—*d*, V—*m* G, all give the perspective point at *n*, which shews three methods, but G or V is the best working point. For the drawing of pediments, I shall shew how they may be performed by vanishing points: but it is a method for which I am no advocate, as it is frequently impracticable, on account of the great distance that is required; but when they can be conveniently obtained, they are in many cases exceedingly useful, as they give the divergency of the mouldings in the pediment with great accuracy. If the pediment is an angle of 90 degrees, as is shewn at R, T, T, then set the compasses on the vanishing point *p*, and with the distance *p*, S describe the curve S, B above, and revolve the same distance below; then will B be a vanishing point for the side of the pediment inclining upwards, and the point below will be the point for the other side. If the pediment be an angle of 126 degrees, as Q, T, T, which is half the height of the other, then revolve round half the length of *p*, S, as *h*, *g*, *g*, then will *g*, *g* be the vanishing points for that angle: and by this method pediments may be drawn to any angle of elevation by knowing its altitude, as shewn in the figure above.

OBSERVATIONS.

I have added to this object a clump of trees, to make it picturesque, and to shew that the landscape accompanying a building in angular perspective should never extend to the distance of the vanishing points, as it would thereby make an angle of 90 degrees, which is far too great; it would also give pain to the eye in viewing it, without turning the head, which should never be done. The angle must at no time exceed 60 degrees.

PLATE XXVIII.

The Method of drawing an Arcade or Piazza, with a Groined Ceiling, in Perspective.

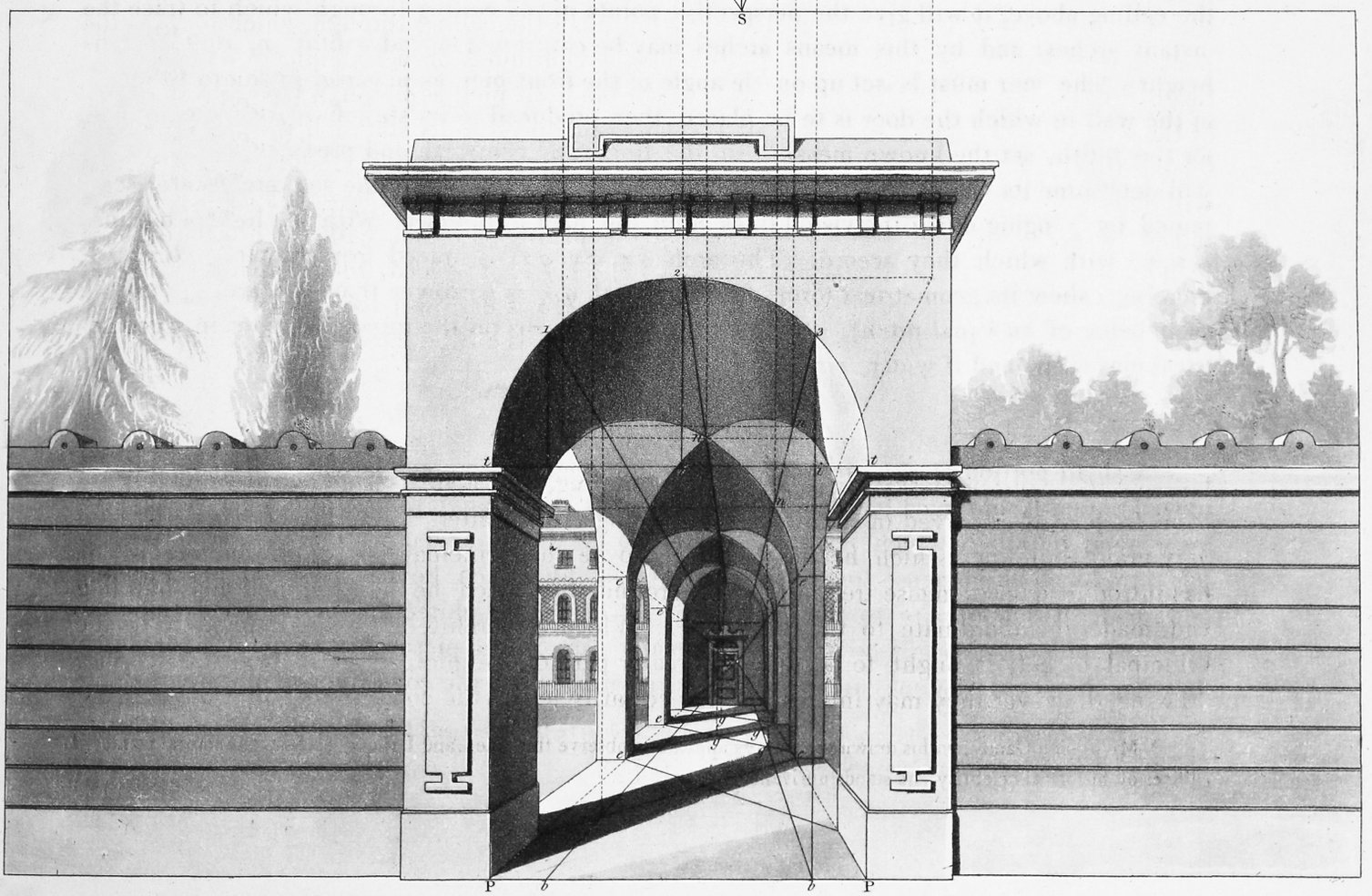
LET *a, a, a, a* be four piers from which the groined ceiling springs, and let the diagonal lines *a, a, a, a* be the seats of the angle ribs on the plan: assume the station point S, and draw the visual rays *r, r, r,* &c. from the respective visible angles of the plan towards S, as heretofore, making the line *m, m* the line of projection; next draw the perspective elevation of the entrance arch below; and for the projection of the cornice, proceed by the same rule as shewn in the parallel Park Entrance, Plate XVI. Set up the height of the eye E in the direction of the line S, C; then to E, as a vanishing point, draw the lines E *p*, E *p* and E *t*, E *t*; then if you bring down the visual rays *r, r, r,* &c. to the perspective drawing, it will give the graduations and recedency of the piers; and the lines *p, p*, E and *t, t*, E will give, at their intersections, as *e, e,* &c. the perspective height of each pier, if lines are drawn parallel to the front wall. For the groined or arched ceiling, divide the entrance arch into four parts, and produce the lines to the plan above; then from the place where they intersect the diagonal lines (running from *a, a, a, a,*) draw visual rays to the station point S, also draw the lines **1, 2, 3** to the vanishing point E; and if the corresponding visual rays *o, o, o* are brought down from the line of projection *m, m,* where they intersect, as at *n, n, n,* will give points through which the perspective angles of the groin are to be drawn. For the other bays of groins, draw their perspective seats on the ground plane, which is easily done by producing lines from angle to angle, as *e, e,* &c. at the base; then bring down the lines **1** and **3** to the plan *b, b*, which draw to the vanishing point E, and if lines are drawn from *g, g, g,* &c. to the ceiling above, it will give the perspective points in the ceiling through which to trace the distant arches: and by this means arches may be continued on ad infinitum. The known height of the door must be set up on the angle of the front pier, as *p, t*, and drawn to the angle of the wall in which the door is to be placed, then produced to its station by a horizontal line: for the width, set the known measure on the line *p, p*, centrical, and produce it to E, which will determine its visual size in the distant end of the avenue. The side arches are ascertained by bringing down the visual lines from the plan to intersect with the horizontal lines *n, n, n,* with which they accord. The arch *q x, q x, q x*, is traced from the arch *i* **1**, *i* **2**, *i* **3**, merely to shew its geometrical form; for if the arch *q, q* is narrower than the arch *m, m* (the groin being of an equal pitch), it will form a semi-ellipsis on the minor diameter in a geometrical elevation, and if wider, *vice versa.*

OBSERVATIONS.

A small portion of sky gives height to a building, and a great height will reduce it. I have frequently observed in architectural drawings, that, after the architect has designed a very grand building, which he has intended to be the principal feature in his picture, he has introduced an immense tree in the fore-ground, by which he has lessened his building and made it subordinate to the landscape. Whenever architecture is intended to be the principal object, it ought to occupy the greater part of the picture*: too many figures in a drawing, however they may interest, will necessarily lessen the consequence of a building.

* Mr. Joseph Gandy, in his drawings, always appears to observe this rule; and I think, as an architectural painter of edifices of historical celebrity, he stands unrivalled.

PLATE 28.

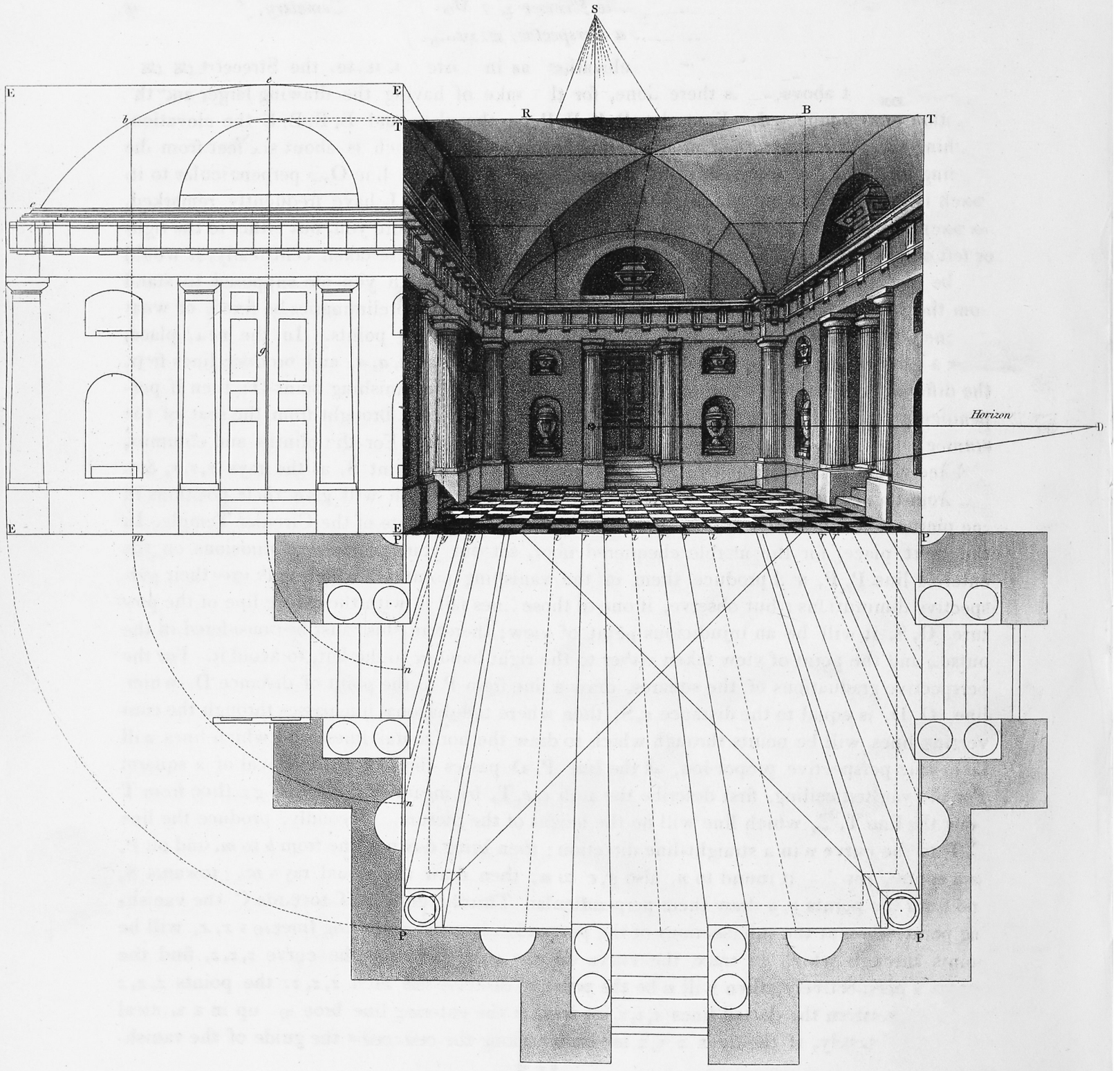


R. Brown, invent.t

London, Printed for Samuel Leigh, 18 Strand, Augst 7th 1814

T.L. Busby, sculp.

PLATE 29.



R. Brown, inven.t

London. Printed for Samuel Leigh, 18 Strand. Aug.st 2nd 1814.

T. L. Busby, sculp.

PLATE XXIX.

Having given the Plan and Elevation of the Interior of a Mausoleum or Cemetery, from the same to make a Perspective Drawing.

HERE I shall annex the plan and elevation, as in Plate XXII. of the Street, and take the station point above, as is there done, for the sake of having the drawing larger and the operation more connected. First, let P, P, P, P be the plan, and E, E, E, E the elevation, touching the angle at P; then produce the horizon D, D, which is about six feet from the entering line P, P, or approach to the cemetery; next draw the line O, S perpendicular to it, which is the direction in which the spectator stands: but, as I have frequently remarked, do not make the line in the centre of the door which is seen before you, but either to the right or left of it, according to your own discretion; for if the line were taken centrically, it would not be picturesque. Secondly, make the line O, S the length you are supposed to stand from the plate or surface of the paper, then will the principal preliminaries be fixed, or what is generally called the preparation of the picture, or working points. In the next place, draw a geometrical profile, or projection of the cornice, as at *a*, *a*, *a*, and produce lines from the different internal and external angles of the profile to the vanishing point O; then if perpendicular lines are drawn from *t*, *t*, *t*, &c. (and which are rays brought from the seat of the cornice), it will give the perspective angles, as at *c*, *c*, *c*, &c. For the plinths and columns, produce visual rays from their respective seats to the station point S, as the rays *r*, *r*, *r*, &c. and from thence draw them perpendicular to the horizon, which will give their positions in the picture: for their diminution, proceed as directed in the Plate of the Circular Temple. In the next place, for the marble chequered floor, set out your geometrical divisions on the entering line P, P, and produce them to the vanishing point O, which will give their perspective diminutions: but observe, if one of those lines fall in with the centre line of the picture, O, S, it will be an injudicious point of view; therefore this must be considered in the outset, and the point of view taken either to the right hand or to the left, to avoid it. For the perspective graduations of the squares, draw a line from P to the point of distance D, which line, O, D, is equal to the distance *r*, S; then where the diagonal line passes through the converging lines will be points through which to draw the horizontal lines, and which lines will be in true perspective proportion, as the line P, D passes through the diagonal of a square. For the vaulted ceiling, first describe the arch *e*, *e*, T, by means of the centre *g*; then from T draw the line T, T, which line will be the height of the picture. Secondly, produce the line T, T to the curve *b* in a straight-line direction; then bring down a line from *b* to *m*, and on P, as a centre, revolve it round to *n*, also *g*, *e* to *n*; then draw the visual rays *n*, *n* towards S, and from the points *y*, *y* draw them perpendicular. Thirdly, draw E, T towards O, the vanishing point; then at the intersections of the perpendiculars and vanishing lines, as *x*, *x*, will be points through which to trace the curve on the side wall: for the curve *z*, *z*, *z*, find the centre *u* perspectively, then will *u* be the point to describe the arch *z*, *z*, *z*: the points *z*, *z*, *z* are acquired from the dotted lines *i*, *i*, *i*, as seen at the entering line brought up in a vertical direction. Lastly, if the lines *z*, *z*, *z* are drawn along the ceiling by the guide of the vanish-

ing point O, and the lines *a x* are drawn horizontally, their junction at *o*, *o* and R, B will be points through which to draw the angle curve or intersections of the cross arches; and hence is the whole of the required object completed.

OBSERVATIONS.

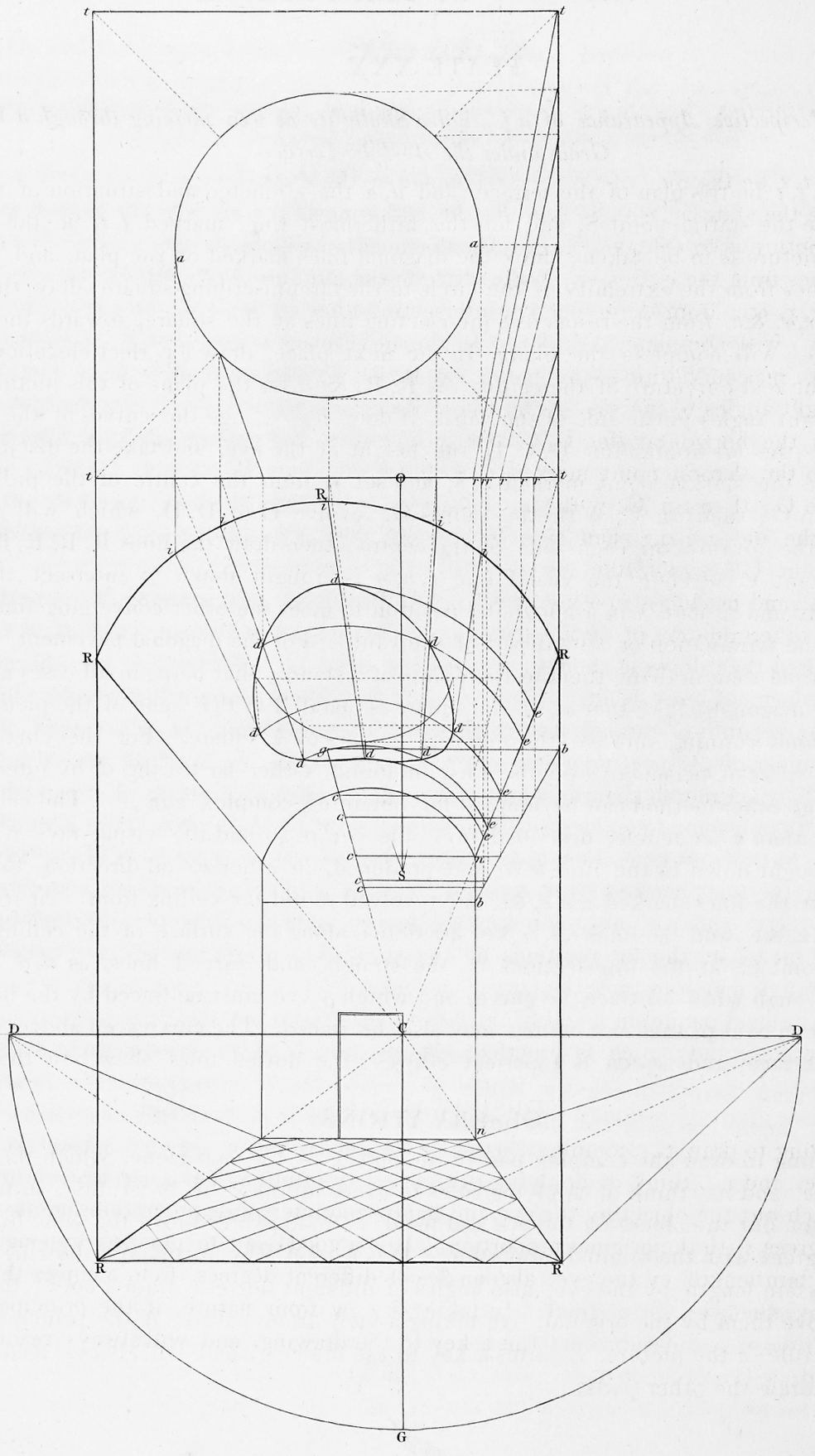
I have here to observe, as in Plate XXII. that if the plan is folded along the entering line P, P, and turned apparently under the perspective floor, making a right angle with the surface of the picture P T, P T, and the line D, O is raised perpendicular on O, that the operation will then appear precisely the same as in Plate XXVIII. the method which I have generally adopted. And again, if the elevation is turned back on the line P, E, as on hinges, making a right angle with the plane or surface of the picture, its connection will then be conspicuously seen, and which must render the whole of the process clear and self-evident; which method I hope the student is by this time well acquainted with, or he has proceeded so far to little purpose. I shall, in the next place, for the benefit of the student, discriminate between the different classes of painting and drawing, and what constitutes those characters, as described by Mr. Richard Payne Knight, in his *Analytical Enquiry into the Principles of Taste*.

Classical Compositions are composed of "ruined buildings, with fragments of sculptured walls and broken columns, the mouldering remnants of obsolete taste and fallen magnificence, which afford pleasure to every learned beholder, imperceptible to the ignorant, and wholly independent of their real beauty, or the pleasing impressions which they make on the organs of sight; more especially when discovered in countries of ancient celebrity, renowned in history for learning, arts, or empire. The mind is led by the view of them into the most pleasing train of ideas, and the whole scenery around receives an accessory character. This is called classical, as the ideas which it excites associate themselves with those which the mind has previously received from the writings called classic."

Romantic Composition "is a species of scenery in which every object is wild, abrupt, and fantastic; in which endless intricacies discover, at every turn, something new and unexpected: so that we are at once amused and surprised, and curiosity is constantly gratified, but never satiated; not only because it is similar to that usually described in romances, but because it affords the same kind of pleasure as we feel from the incidents usually related in such of them as are composed with sufficient ability to afford any pleasure at all."

Pastoral Compositions "are scenes in which we are delighted with neat and comfortable cottages, inhabited by a plain and simple, but not rude or vulgar, peasantry; placed amidst cultivated, but not ornamented, gardens, meads, and pastures, abounding in flocks and herds, refreshed by bubbling springs, and cooled by over-hanging shade: though the impression which it makes upon the senses be pleasing, yet this pleasure is greatly enhanced to a mind conversant with pastoral poetry, by the association of the ideas excited with those previously formed."

PLATE 30.



R. Brown inven.t

London. Printed for Samuel Leigh. 18 Strand. Augst 2nd 1814.

T.L. Busby sculp.

PLATE XXX.

The lineal Perspective Appearance of a Cylinder Skylight, as seen piercing through a Vault or Groin under the Adelphi Terrace.

LET t, t, t, t be the plan of the terrace, and a, a the diameter and situation of the sky-light: assume the station point S, and let the hithermost line, marked t, t, be the line on which the picture is to be taken; draw the diagonal lines marked on the plan, and produce the dotted lines from the extremity of the circle to the circumscribing square; draw the visual rays marked r, r, &c. from the respective intersecting lines at the square, towards the station point S, which will complete the plan. In the next place, draw a perfect elevation of the vault, with the real curvature of the ceiling, as R, R, &c.; for the plane of this picture being situated at right angles to the side of the vault, it does not change the curves of the original object: draw the horizontal line D, C, D the height of the eye, and take the distance from the picture to the station point marked o, S, and set it from the centre of the picture, C, downwards to G; then on C, with the radius G, revolve G to D, D, which will give the distance of the picture on each side of the centre: then draw the lines R, R, R, R to the vanishing point C; then if the visual line r, n, n is brought down to intersect the lines marked R, R, and produced in a horizontal position to meet the other converging lines R, R, it will give the termination or distant part of the vault. For the diagonal pavement, nothing more is required than drawing them to the points of distance, that being in all cases a vanishing point for diagonal lines; that is, if the square is parallel to the plane of the picture, and which are lines running through the opposite corners of a square. For the curve in the ceiling, a number of perspective points must be found, either by tracing or by intersections of lines, as no other method can be adopted for obtaining complex curves. The ceiling is a segment less than a semicircle, described from the centre g; and the visual rays r, r, r, &c. are to be brought down to the line b, b, and produced, in a horizontal direction, to the line g, C; then if the lines marked e, e, e, &c. are revolved round the ceiling from their respective centres, c, c, c, &c. and the lines i, i, i, &c. are drawn along the surface of the ceiling to the vanishing point C, at the intersections of the straight and curved lines, as d, d, &c. will be points through which to trace the curve, and which curve must be traced by the hand: by this method an oval pannel in a ceiling may also be traced. The curve seen above is on the top of the terrace, and which is a perfect ellipsis; the dotted lines shew how the same is obtained.

OBSERVATIONS.

In learning to draw the complex part of an object by the eye alone, which the student must practise, and not think of applying rules to every minutia, he must first, in trying his powers, sketch out the object by the eye and hand, and afterwards prove the same by rule, to see how it agrees with the original proportion. It is a good way to practise drawing straight lines to a certain length by the eye, also angles of different degrees, from a copy; then, with a sector, prove them by the original. In taking a view from nature, if the principal object is drawn by rule in the picture, it forms a key to the drawing, and will always readily guide the hand to draw the other parts.

PLATE XXXI.

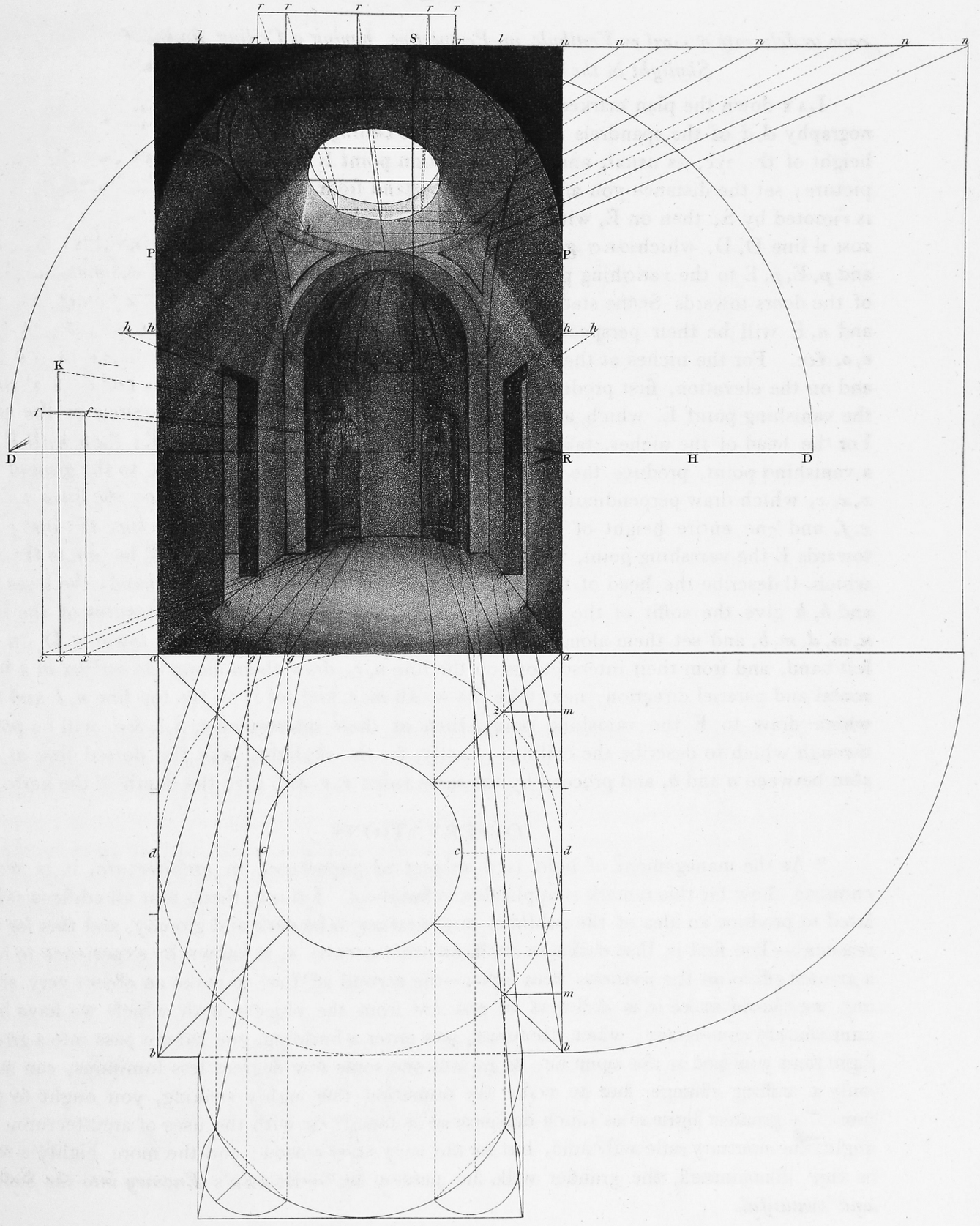
How to delineate a Hall or Vestibule in Perspective, having a Ceiling finished with Spandrels, a Skylight in the Centre, and circular Niches in a curved Recess.

LAY down the plan marked *a a*, *b b*, and inscribe the seat of the skylight *c*, *c*, and ichnography *d*, *d* of the spandrels (terminating the ceiling) within it: make the horizon H the height of the eye, as usual, and take the station point E about one third of the width of the picture; set the distance you are supposed to stand from the picture on the line E, S, which is denoted by S; then on E, with the radius E, S, describe the distance around to the horizontal line D, D, which will give the diagonal vanishing points: draw the lines *a*, E, *a*, E and *p*, E, *p*, E to the vanishing point E; next draw lines from the angles of the plan and places of the doors towards S the station point, and where they intersect the vanishing line *a*, E and *a*, E will be their perspective points, which are then drawn up the picture, as from *o*, *o*, &c. For the niches at the end of the vestibule, which are circular both on the plan and on the elevation, first produce the parallel lines *g*, *g*, *g* from the plan, and draw them to the vanishing point E, which also draw perpendicular from their intersections at the plan. For the head of the niches, take a point any where in the horizon, say R; then with R, as a vanishing point, produce the lines from the bottom of the niche *t*, *t*, *t* to the ground line *x*, *x*, *x*, which draw perpendicular; then set up the height of the springing on the lines *x*, *f* and *x*, *f*, and the entire height of the niche head on the line *x*, *k*; then produce the line *f*, *k*, *f* towards E the vanishing point, and where they intersect, as at *e*, *e*, *e*, will be points through which to describe the head of the niche, and which must be drawn by hand: the lines *h*, *h* and *h*, *h* give the soffit of the door-ways. For the ceiling, take the measures of the lines *a*, *m*, *d*, *m*, *b*, and set them along the top line *n*, *n*, *n*, *n*, *n*, which produce towards D on the left hand, and from their intersections on the line *n*, *r*, draw them along the ceiling in a horizontal and parallel direction; next take the width *m*, *z*, and set it on the top line *n*, *l* and *n*, *l*, which draw to E the vanishing point; then at their intersections, *i*, *i*, &c. will be points through which to describe the ceiling. Lastly, for the skylight, take the dotted line at the plan between *a* and *b*, and proceed by the same rule: *r*, *r*, &c. give the depth of the kerb.

OBSERVATIONS.

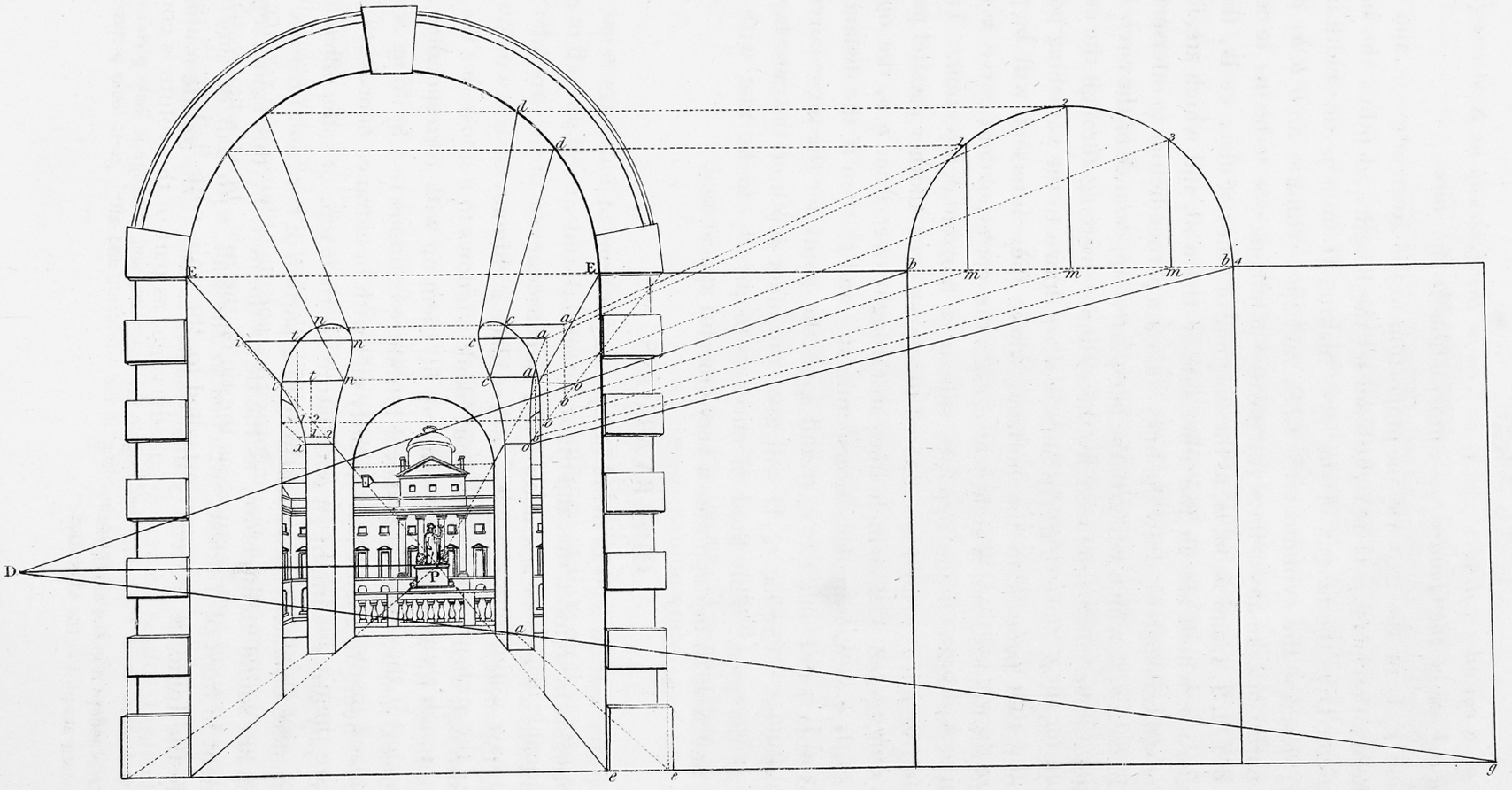
" As the management of light is a subject of importance in architecture, it is worth enquiring how far this remark is applicable to building. I think, then, that all edifices calculated to produce an idea of the sublime, ought rather to be dark and gloomy, and this for two reasons:—The first is, that darkness itself, on other occasions, is known by experience to have a greater effect on the passions than light:—the second is, that to make an object very striking, we should make it as different as possible from the objects with which we have been immediately conversant: when, therefore, you enter a building, you cannot pass into a greater light than you had in the open air; to go into one some few degrees less luminous, can make only a trifling change; but to make the transition thoroughly striking, you ought to pass from the greatest light to as much darkness as is consistent with the uses of architecture. At night, the contrary rule will hold, but for the very same reason; and the more highly a room is then illuminated, the grander will the passion be."—BURKE'S *Enquiry into the Sublime and Beautiful.*

PLATE 31.



F. Brown. inven.t London. Printed for Samuel Leigh. 18 Strand. Aug.t 2.nd 1824. T.L. Busby sculp.

PLATE 32.



R. Brown. inven.t

London. Printed for Samuel Leigh. 18 Strand. Augst 2nd 1814.

T.L. Busby sculp.

PLATE XXXII.

The Perspective Outline of a cylindro-cylindric Arch, as seen in the Gateway at Somerset-House, with a View of the Quadrangle seen through the Aperture.

DRAW the elevation E, E of the gateway in proportion to the given original, and make *e*, *e* the thickness of the wall or piers; on the right hand set the length or depth of the side, as *e*, *g*; then draw the horizon D, *p* the height of the eye, making D from *p* the width of the picture, namely, E, E; describe the cylindro arch E, E, and the cylindric arch *b*, *b*; divide the arch *b*, *b* into four parts, or take any points you please, admitting one to be in the centre; next produce the lines *b*, 1, 2, 3, 4, and *m*, *m*, *m*, to the diagonal or point of distance D; then, at their intersections *o*, *o*, *o*, *o*, *o*, which are on the other side of the wall, and which are, for the better elucidation, supposed transparent, draw the lines *o*, *o*, *o*, *o*, *o* perpendicular to intersect with the descending dotted lines *a*, *a*, *a*, which will give the perspective appearance of the circle *b*, 2, *b* on a vertical wall: then for the curve produced by the cylinder piercing through the ceiling, draw the lines 2, 1 to the arch *d*, *d*; then if the lines *d*, *d* are drawn to the vanishing point *p*, and the lines *a*, *a*, *a* are drawn parallel to the horizon, where they intersect will be points through which the curve will pass, and which is at *c*, *c*, *c*: the correspondent curve *n*, *n*, *n* is obtained by producing the lines to the opposite side in a horizontal direction. To find the visible part of the curve *i*, *i*, *x*, which is supposed to appear over another parallel passage, first, find the centre of 1, 2 and 1, 2, which lines are brought over from *o*, *o*, the opposite side; then draw 1, *t* and 1, *t* perpendicular, intersecting at *t* and *t*; then if the distances *t*, *n* and *t*, *n* are transferred from *t* to *i* and *t* to *i*, it will give the point for the inner curve, and which is of the same species. The line *g*, D will give the inner depth of the gateway at Q, the invisible corner of the pier. This kind of curve is frequently to be met with in the ceilings of churches, and has, in my opinion, a very graceful appearance.

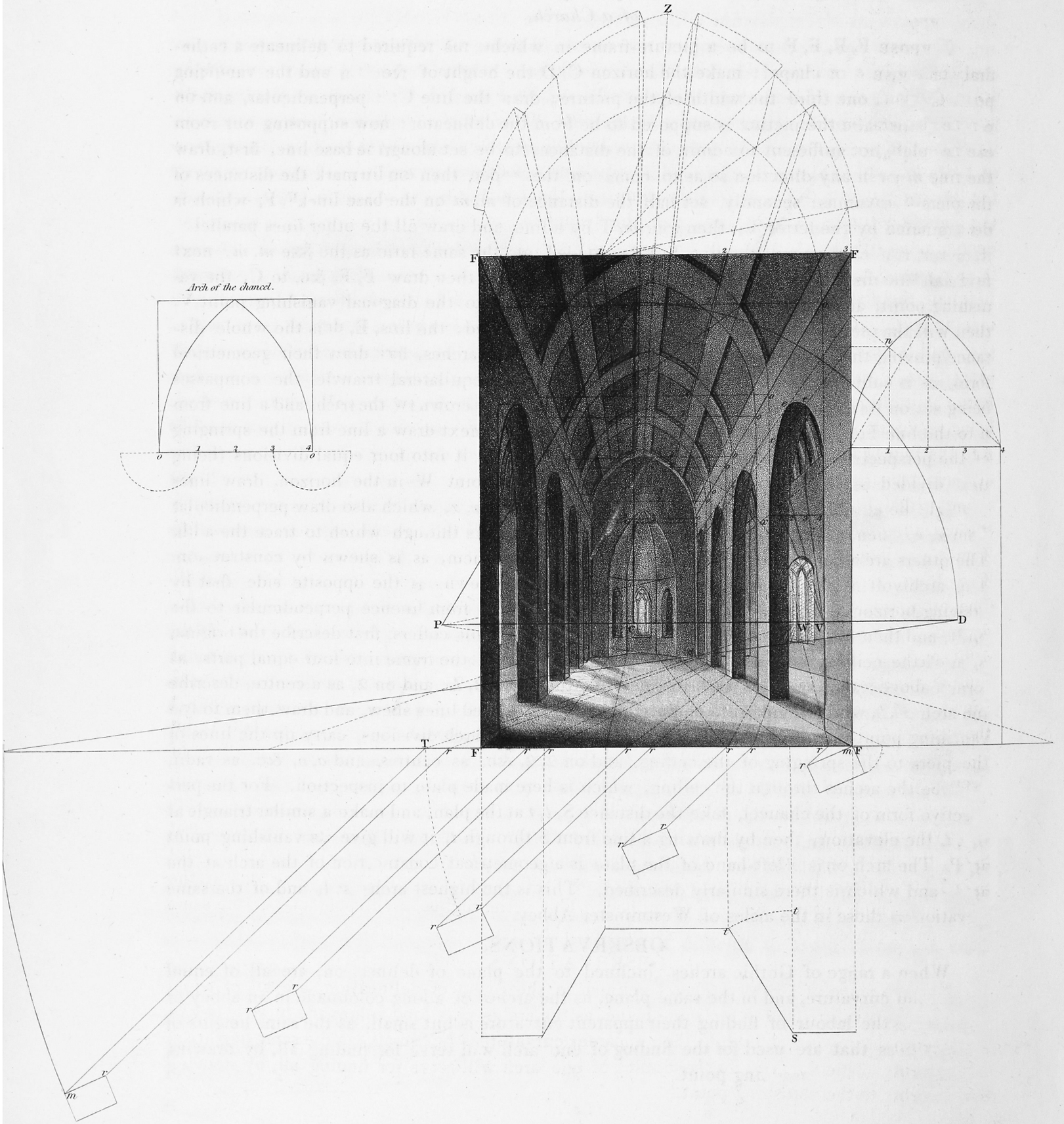
OBSERVATIONS.

The historical painter will do well to avoid in his compositions of buildings what is here pointed out as objectionable in architecture, and the architectural student will do well to observe the same:—Never to have a pier over a window; for, in consequence of an irregular settlement in the building, the arch will give way*:—never place a chimney over a window, for it looks like a window through a chimney:—never put blank windows to a house, for they exhibit poverty of design; but if they must be introduced, fill them up with corresponding sashes, and paint the wall black inside the glass:—never introduce columns to a building without a sufficient weight above them; this fault is frequently met with in entrance door-ways:—never introduce pilasters of any order without an entablature on their top, or some office for them to perform more than mere ornament: a pediment with a portion of horizontal cornice returning along the wall, is not sound architecture, as the tie of the roof, by this figure, appears to be cut off: a pediment in front of a house, attached to the wall, with half or three-quarter columns, particularly the Ionic, is extremely unadvisable, as part of the volute is concealed:

* I have shewn what I allude to in the centre building in the Crescent, and although it looks picturesque in the drawing, I should by no means adopt it in the execution.

Gothic sashes, having circular heads, are a barbarous and incongruous mixture:—never use pediments in the internal part of a building, for they are intended to represent roofs; this absurdity is to be seen in the Pantheon at Rome: pediments over a window in a circular-headed recess, as at the Horse Guards, is bad taste, as the circular revele answers the purpose of the pediment:—rusticated angles to houses are useless ornaments, and have a meagre appearance: rustic design, wherever it is used, should only be applied in the basement story (prisons excepted), or no higher up than the principal entrance—Wanstead House is a good specimen of this kind:—never make the piers of a house narrower than the windows, for it greatly weakens the building:—urns and vases on the top of a building are ill placed; as they are intended to contain garden plants, they should be used as ornaments of the base, and placed on pedestals or the balustrade of a staircase to the front entrance of a house: balls on the top of a house, or on lofty entrance piers, have a terrific appearance, as they appear scarcely to stand safe:—in the metopa of the Doric order, never use ox-sculls; for they are disgusting; but if they must be used, let them be used to temples of sacrifice:—festoons of flowers on the external part of a building are frequently unintelligible when high up, and if low down they will collect the dust:—never mix Grecian and Gothic architecture, nor Roman and Gothic, in the same building: indeed, the heterogeneous mixture of the different styles of architecture is extremely objectionable, but more so of some orders than of others: the two that will best accord are the Saxon and Gothic; in some instances, the Egyptian and Grecian may be united with considerable effect. The best application of the five orders of architecture to buildings appears to be this:—For market-places and all plain buildings, use the Tuscan; for churches and all sacred buildings, use the Doric, if the Gothic (which may be considered ecclesiastical architecture) is not preferred; for theatres, and all places of public amusement, use the Ionic; the Corinthian may be used for a palace, but it appears, on account of its heavy capital, only fit for the internal parts of a building, such as saloons, vestibules, halls, &c.; the Composite is applied to triumphal arches, commemorative pillars, &c. —In historical compositions, always let the architecture and landscape be of the country to which the subject relates:—always let your buildings be so characterized, that any one may know their use by their external appearance: to do this, the ornaments must accord with the style of the building. Nothing should appear forced into a design, but let the ornaments result from the character of the edifice, always having the parts in proportion to each other, and the whole well balanced. Some buildings will look well in one situation that would look ill in another, arising from the local accompaniments or aspect of the country: hence arises the necessity of an architect being acquainted with landscape painting, to be able to adapt his design to the surrounding scenery. Whether uniformity is requisite in all buildings, is a question submitted by Mr. Gandy; he thinks only in buildings of the higher class, such as heathen temples, which are intended to convey an idea of grandeur and sublimity. Cottages, he thinks, should be irregular or picturesque. The rotunda, being beautiful, he is of opinion it should be uniform. In all other designs, he advises not to have "parts answering parts," as it exhibits only a dull monotony; but he confesses it difficult to avoid discord in such compositions.

PLATE 33.



R. Brown. delt.

London, Printed for Samuel Leigh, 18 Strand. Aug.st 2nd 1814.

T.L. Busby. sculp.

PLATE XXXIII.

How to draw the Perspective Representation of a coffered Ceiling and Gothic Arches in the Aisles of a Church.

SUPPOSE F, F, F, F to be a picture-frame in which it is required to delineate a cathedral, tabernacle, or chapel: make the horizon C, D the height of the eye, and the vanishing point C about one third the width of the picture; draw the line C, S perpendicular, and on it set the distance the picture is supposed to be from the delineator: now supposing our room on the plate not sufficient to admit of the distances to be set along the base line, first, draw the line *m*, *m* in any direction so as to come on the paper, then on it mark the distances of the piers or columns; secondly, set half the distance of *m*, *m* on the base line F, F, which is denominated by the letter T; then join *m*, T by a line, and draw all the other lines parallel to it, as *r*, *r*, *r*, &c. then will the line T, F be divided into the same ratio as the line *m*, *m*: next find half the distance between C and D, which is at V; then draw F, F, &c. to C, the vanishing point, and draw the divisions marked *r*, *r*, *r*, &c. to the diagonal vanishing point V, then will the piers in the aisle be perspectively proportioned: the line E, D is the whole distance proving the half distance, as appears at *d*. For the arches, first draw their geometrical form, as is subjoined, and which is described about an equilateral triangle, the compasses being set on its extreme diameter: produce a line from the crown of the arch, and a line from *n* to the line F, F, which draw to the vanishing point C; next draw a line from the springing of the perspective arch parallel to the horizon, and divide it into four equal divisions (being then divided as the geometrical one); then, from the point W in the horizon, draw lines through the points 1, 2, 3, 4 to meet the converging lines *x*, *x*, which also draw perpendicular from *x*, *x*; then, at their intersections, *e*, *e*, *e*, will be points through which to trace the arch. The others are ascertained by drawing diagonals across them, as is shewn by construction. The archivolt is acquired by intersecting planes, as shewn on the opposite side, first by drawing horizontal lines at the springing of the arch, and from thence perpendicular to the soffit, and then horizontal again. For the pannels, or Gothic coffers, first describe the original form of the ceiling, which is done by dividing the top of the frame into four equal parts, as shewn above; then on 1, as a centre, describe the curve 3, Z; and on 2, as a centre, describe the arch F, Z, which divide into compartments, as the dotted lines shew, and draw them to the vanishing point C; also draw 1 and 2 to C: then, for the arch divisions, carry up the lines of the piers to the springing of the ceiling, and on 2, 2, &c. as centres, and *o*, *o*, &c. as radii, describe the arches through the ceiling, which is here made plain to inspection. For the perspective form of the chancel, take the distance S, *t*, *t* at the plan, and make a similar triangle at S, *t*, *t*, the elevation; then by drawing a line from S through *t*, it will give its vanishing point at P. The arch on the left-hand of the plate is a geometrical construction of the arch at the altar, and which is there similarly described. This is the highest arch used, and of the same elevation as those in the aisles of Westminster Abbey.

OBSERVATIONS.

When a range of Gothic arches, inclined to the plane of delineation, are all of equal widths and curvature, and in the same plane, as the arches of a long colonnade in an abbey or monastery, the labour of finding their apparent curvature is but small, as the same heights of the ordinates that are used for the finding of one arch will serve for finding all, by drawing their heights to the vanishing point.

PLATE XXXIV.

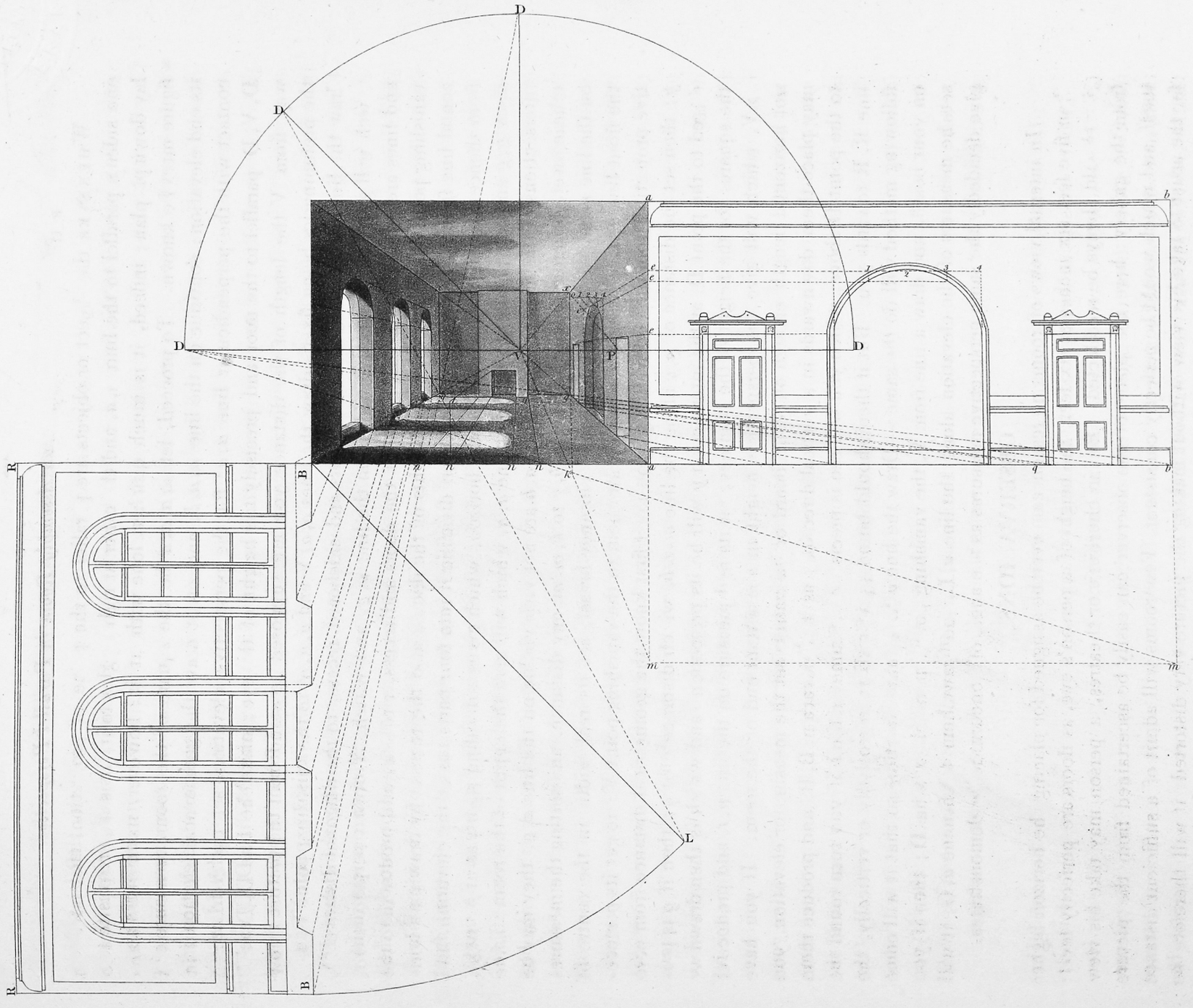
How to draw a Dining or an Assembly-Room in Parallel Perspective.

WHENEVER the object or objects are parallel to the plane of projection, that is, when one side is parallel to the line *a, a*, and the other at right angles to it, it is never requisite to lay down a plan; indeed, it is much quicker done without it: however, its measures and figure must be known. To proceed, let *a, a, a, a* be the square of the room, or measure of its end elevation; continue on the line *a, a, b*, and on it draw the geometrical elevation in contact with the perpendicular line *a, a:* for the perspective elevation, set up the horizon D, V, D parallel to the floor and precisely the height of the eye; make the line D, D each way from V the length of the distance you are supposed to stand from the picture: now the preliminaries being fixed, draw the lines *a, a*, V and *a, a*, V to the vanishing point V, and draw the lines between *a, b*, for the doors and sideboard recess, to the diagonal distance D, which will give the perspective widths on the line *a, g*, and which, if drawn perpendicular, and lines are brought from the heads of the doors and recess, as *e, e, e*, and produced to the vanishing point V, it will give the heights of the doors; also the recess, by drawing a horizontal line from *o*, at any length, and then dividing it into four parts, as in the elevation, and from thence drawing it through C to the horizon, which gives a dividing point, as at *p:* next, draw *g, g* and *x, x* parallel to the front line *a, a*, which will give the depth of the room: if the intersections of the lines produced from *a, b* are not very visible on the line *a, g*, they may be taken lower, bringing down the lines *a, b, g* to *k, m, m*, any distance, and setting the measures on the line *m, m*. For the chimney and chimney-breast, set its real width in the centre of the front line *a, a*, as at *n, n, n, n*, and draw them to the vanishing point V: to get its perspective projection from the end wall *g, g*, you must first know the geometrical distance from *n* to *y;* then set the distance of *n, y* along the line *a, a, b*, which distance is at *q;* then if *q* is produced to the point D, at the intersection *y* will be its projection, and which is then drawn by the square: for the height of the chimney, set its real measure on the line *n, t*, and produce it to V, which will give the perspective height in the distant end of the room. If you have not horizontal length enough on your board or canvas to set the measure or elevation, you may place them downwards in a vertical direction, as the elevation B, B, and produce them to the point D above; which you will see is precisely the same method, if you turn round the line R, R towards you. But if there should be no room either horizontally or vertically, the following method will do the same:—Draw the line *a*, L in any direction so that it will come on your board, and draw a line from V, the vanishing point, parallel to it, as D; then if you set the measures of the elevation along the line *a*, L, and draw them to the line *a*, G, it will give decidedly the same perspective measures as the angle of concurrence *g* demonstrates.

OBSERVATIONS.

In internal views of rooms no reason can ever be assigned for placing the horizon higher than five feet six inches or six feet, the height of a person's eye, as floors are perfectly level: this should always be recollected. But in churches or theatres, a person may take his view from the gallery: here the place of the observer can easily be ascertained from the picture itself, and which would be perfectly consistent. Few rooms will admit of a sufficient distance for the artist to take his view without making the picture very distorted: it will therefore be more graceful to make the drawing from measures taken from the object, supposing the wall behind us, or the end of the room removed away.

PLATE 34.

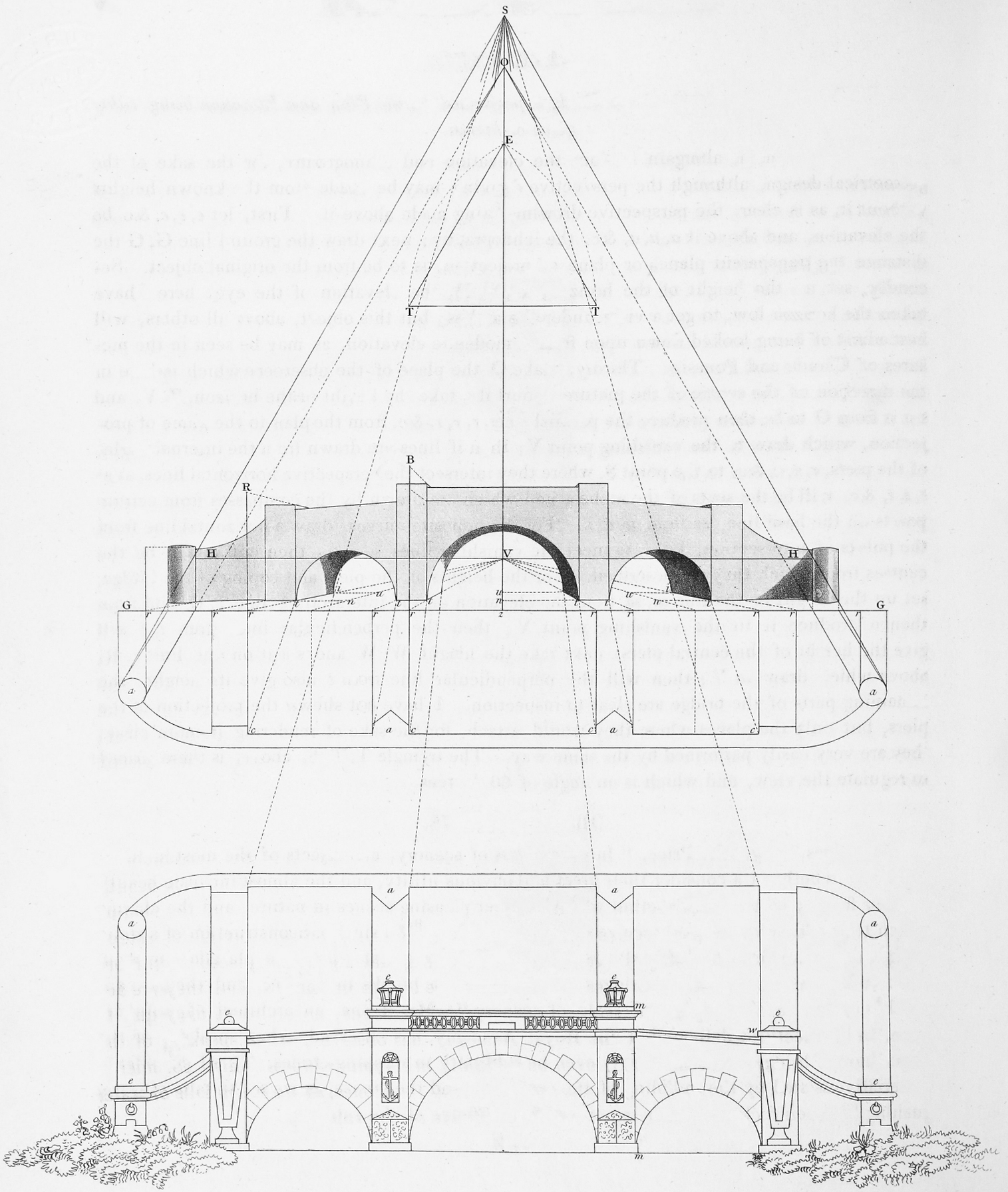


R. Brown. inven.t

London. Printed for Samuel Leigh. 18 Strand. Aug.t 2nd. 1814.

T. L. Busby. sculp.

PLATE 35.



R. Brown, invent.

London. Printed for Samuel Leigh. 18 Strand. Augst 2nd 1814.

T.L. Busby, sculp.

PLATE XXXV.

The Application of Perspective to a Bridge, performed by the Plan and Elevation being either given or known.

In this plate I shall again subjoin the elevation and ichnography, for the sake of the geometrical design, although the perspective drawing may be made from the known heights without it, as is clear, the perspective drawing being made above it. First, let *e, e, e*, &c. be the elevation, and above it *a, a, a*, &c. the ichnography; next draw the ground line G, G the distance the transparent plane, or plane of projection, is to be from the original object. Secondly, set up the height of the horizon, H, V, H, the elevation of the eye: here I have taken the horizon low, to get a view under the arches; but this object, above all others, will best admit of being looked down upon from a moderate elevation, as may be seen in the pictures of Claude and Poussin. Thirdly, make O the place of the observer, which is here in the direction of the centre of the picture. Fourthly, take the height of the horizon, Z, V, and set it from O to S; then produce the parallel lines *r, r, r*, &c. from the plan to the plane of projection, which draw to the vanishing point V; then if lines are drawn from the internal angles of the piers, *c, c, c*, &c. to the point S, where they intersect the perspective horizontal lines, as at *t, t, t*, &c. will be the seats of the arches, and which are drawn by the compasses from central points in the base line, as from *n, n, n*. For the opposite curves, draw a horizontal line from the points of intersection, *i, i, i*, to meet the vanishing lines *n, n, n*; then will *u, u, u* be the centres from which they are described. For the heights of the piers and coping of the bridge, set up the height of the line *m, m* from the elevation on the intersectiing line *r*, B, and from thence produce it to the vanishing point V; then the perpendicular lines from *t, t* will give the height of the central piers: next take the height W, W and set it on the line *r*, R, above which draw to V; then will the perpendicular line from *t* also give its height: the remaining parts of the bridge are clear to inspection. I have not shewn the projection of the piers, but only the places where they would attach, for the sake of rendering it more clear; they are very easily performed by the same way. The triangle T, T, F, above, is there placed to regulate the view, and which is an angle of 60 degrees.

OBSERVATIONS.

"Bridges," says Mr. Price, "in every class of scenery, are objects of the most interesting kind; whether we consider their great and obvious utility, and the almost intrinsic beauty of their forms; or their connection with the most pleasing scenes in nature, and the charms which they add to water, and receive from it in return. The simplest construction of a stone bridge, and, therefore, probably the earliest, is, where long flat stones are placed upon more thick and massive ones. Such bridges we often see over brooks in villages, and they are admirably suited to that style and scale of scenery."—Mr. Soane, an architect of exquisite taste, in his Lectures delivered at the Royal Academy, has observed, when speaking of the disposition of bridges, that there may even be sublimity in stepping-stones. This I consider is materially assisted by the bubbling of the stream around the stones, as we see in falls of water gushing between rocks, water being of itself productive of the sublime.

PLATE XXXVI.

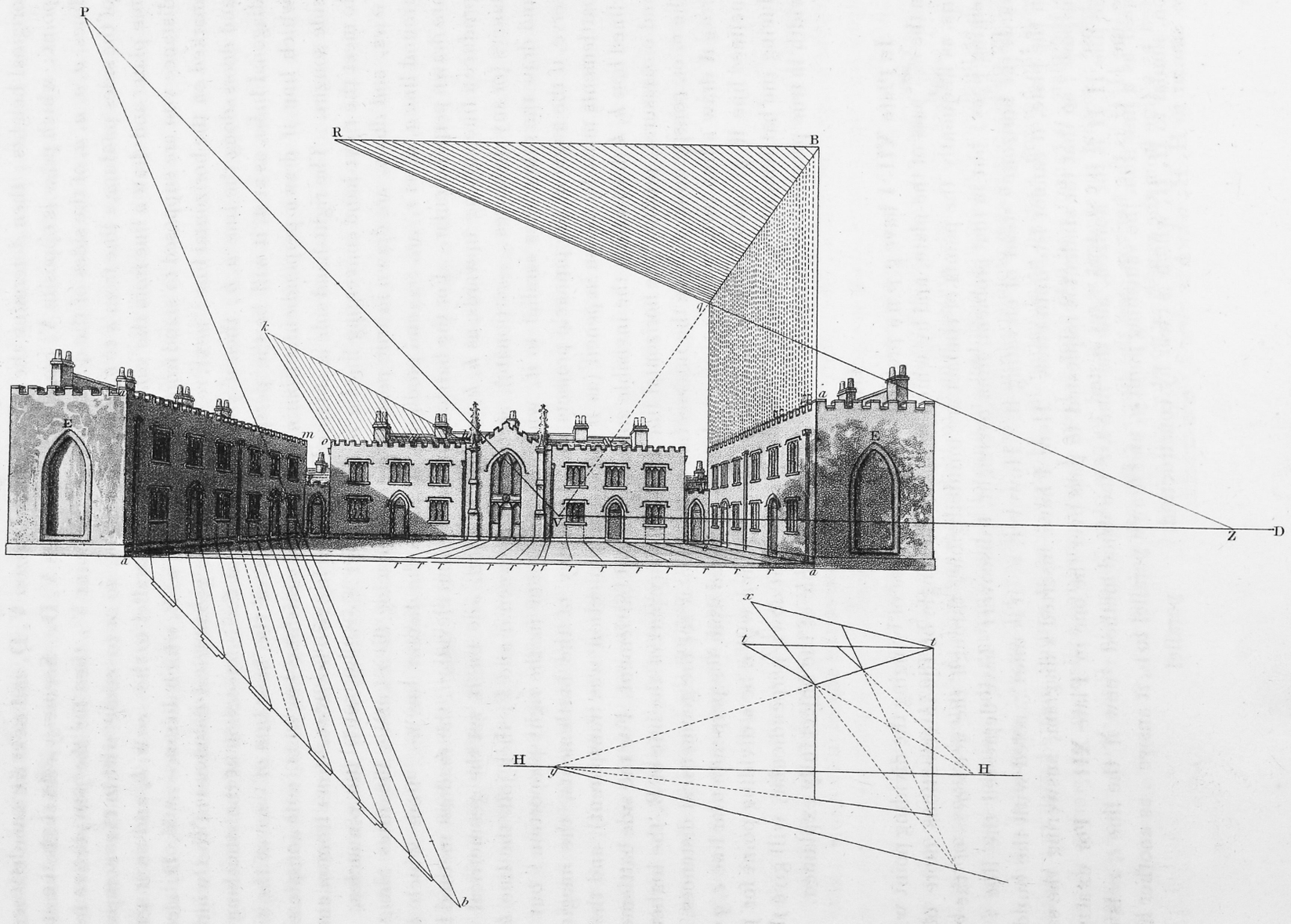
A detached View of the Alms-Houses near Blackfriars-Road, erected by the Rev. ROWLAND HILL; *shewing the most practical Methods of abbreviating Perspective.*

FIRST draw the ends E, E of the quadrangle, according to their geometrical distance and original heights; then determine the height of the horizon V, D, and next fix upon the station point; which point is opposite V, equal to the distance V, D. Secondly, draw the vanishing lines, *a*, *a*, *a*, *a*, of the sides of the quadrangle to the point V; then for the perspective length of the sides produce a line from *a* to *b*, in any direction, so as to come within the compass of the plate; and draw a line from the vanishing point V parallel to the line *a*, *b*, and on it set the distance you are supposed to stand from the plane *a*, E, *a*, E, which distance is V, D, already marked on the horizontal line; next, regularly place the geometrical distances of the windows and doors along the line *a*, *b*; then if you draw *b* to P at the intersection of the vanishing and diagonal lines, as at *n*, it will be the perspective length of the base line of one of the sides, which line, if drawn perpendicular from *n* to meet the vanishing line *a*, *m*, will complete the side sought. The right-hand side is obtained by producing two horizontal lines from *m* and *n*, to meet the right-hand converging lines *a*, *a*. The front elevation, with the pinnacles, windows, and doors, are drawn in true perspective, by placing their known measures along the ground line *a*, *a*, as *r*, *r*, *r*, &c. and producing them to the distant line *n*, *e*, from which they are drawn perpendicular. For the battlements in the front elevation, the readiest method is to produce a line sloping upwards, as *h*, *k*, in any direction, and on it set the geometrical distances (or any distances proportionate), ascertained between *h* and *k*; then join the line *k*, *o*, and draw the other lines parallel to it, which divides them in the right proportion: but observe, if the angle of the pinnacle projects and hides any of the battlements, the imaginary battlements must be drawn in pencil (as if the centre projection was transparent), and the inclined line *h*, *k* drawn from the invisible angle of the end battlement. For the side battlements and embrasures, produce the horizontal line R, B from any part of the line *a*, B, the higher up the more conspicuous will be the intersections; then on it set the geometrical distances, and from R draw a line through the point *q* (which is acquired from the perpendicular line *e*, *q* and inclined line R, *q*) until it falls in with the horizon Z; then will Z be a dividing point for producing the battlements to the line B, *q*, which, if brought down perpendicular, will give their width in true perspective proportion: and thus is the whole of the object fully explained.

OBSERVATIONS.

In Plate XII. I have given a problem for the purpose of bringing the dividing point within the compass of the plate, and by which to make the angle of the intersections more obvious, as frequently the points of contact are unintelligible, through the acuteness of the converging lines; but in that problem, from oversight, I discover I have depressed the line *i* towards the horizon, instead of elevating it. However, as it is unconnected with the building on the plate, it cannot lead into error. Here I have inserted a diagram, answering the same purpose; so that the student is requested to pass over the one in Plate XII. For example, the line H, H is the horizon, and the line *t*, *t* the usual method: now if the line *t*, *x* is elevated as a line from the vanishing point *y*, and drawn parallel to it, it answers as another horizon, similar to H, H; which is clear by construction.

PLATE 36.

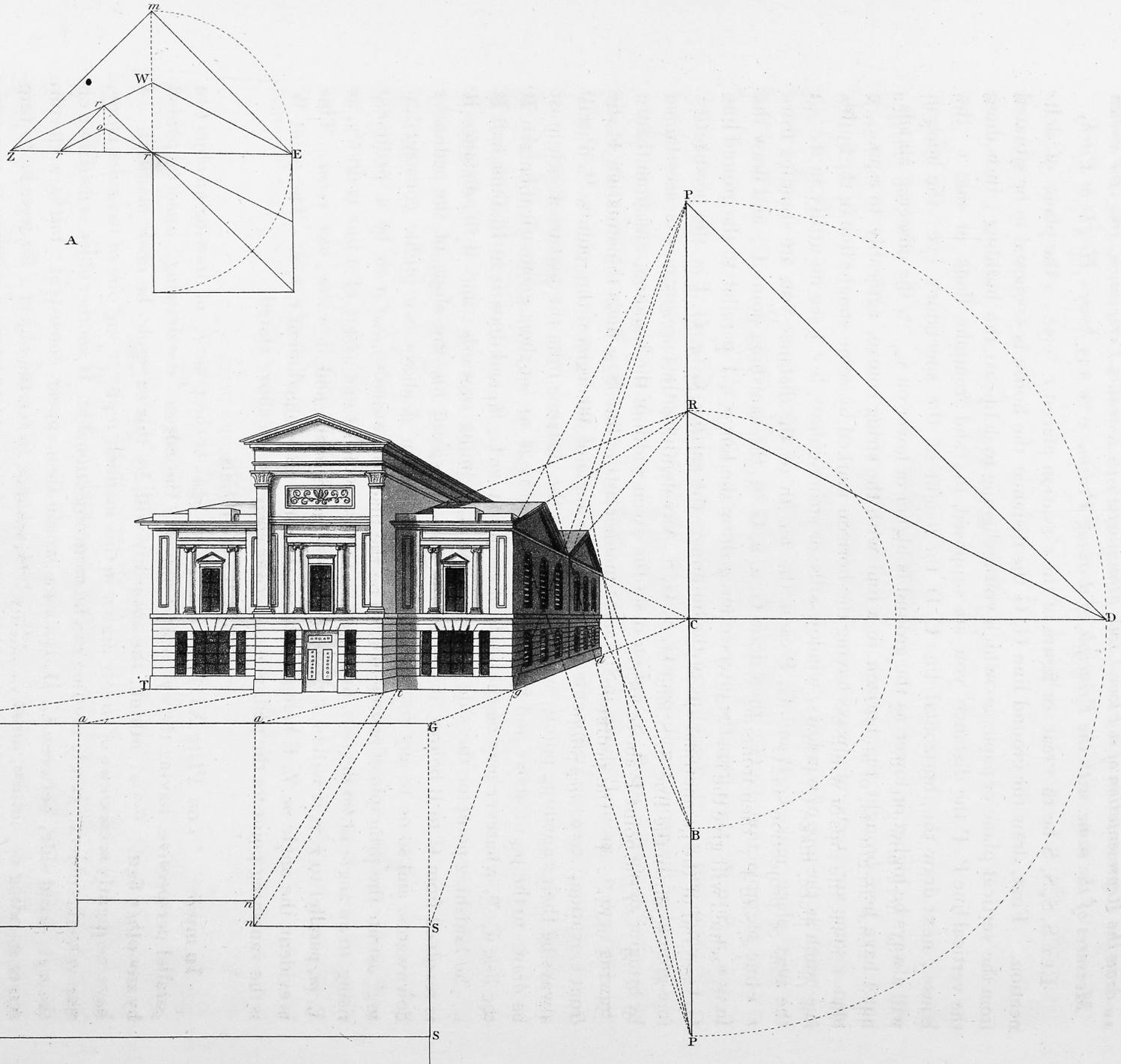


R.Brown. del.t

London. Printed for Samuel Leigh, 18 Strand. Augt 2nd 1814.

T.L.Busby. sculp.

PLATE 24.



R. Brown. inven.t

London. Printed for Samuel Leigh. 18 Strand. Aug.st 2nd 1814.

T.L. Busby. sculp.

PLATE XXXVII.

To draw the Representation of a Floor-Cloth Manufactory in Parallel Perspective, from the known Measures of the same, with the Principle of drawing Pediments to any known Height or Pitch.

LET S, S, S, S be the seat or figure of the elevation placed reverse to the plane of delineation. First, draw the ground line G, G the distance the house is supposed to be situated from the vertical plane or paper on which you are going to delineate the building ; then draw the vertical line P, P the distance you are supposed to stand from the flank or side of the house ; next draw the horizontal line C, D the height of the spectator's eye : the horizon will always be higher or lower as the ground is higher or lower on which the observer stands ; but I have here brought the horizon in a line with the string course, agreeably to a practice among some architects, of always having the horizon marked by some staight line in the building; such as the tops of windows, window-sills, or string-course, but I see no utility in it. In the next place, make C, P and C, P each the length of the distance you are standing from the line of projection G, G ; then draw G, *a*, *a*, G to the vanishing point C, and draw the lines *n*, *n*, S to P ; then from the intersection *g* draw the line *g*, *t*, T parallel to the ground line G, G, which will give the base line of the building : the surface G, *g*, G, T is the perspective fore-ground of the geometrical space G, S, G, S. Any depth for the building may be ascertained by bringing down the line S, S, and on it set the given width of the building, and from thence drawing it to the point P above, in the same manner as the line S, *g* finds the situation of the front elevation. For the pediments, if they rise an angle of 90 degrees, the points P, P will always be their vanishing points, which is equal to the distance from the picture which must be drawn to the point above and below. The best way is to set their geometrical height on the line C, P, whatever may be the angle of elevation, as C, R, and draw it to D, then will R be the vanishing point for the side of the pediment inclining upwards ; and if the distance R is revolved from C to B below, it will be the vanishing point for the slope of the pediment downwards, and so on to any rise whatever. The diagram A above is a profile construction to illustrate the principle of pediments more fully. First, suppose *r*, *r*, *r* to be a pediment rising to an angle of 90 degrees, and E to be the place of the eye ; now, if a line is drawn, as E, *m*, parallel to *r*, *r*, it will be its vanishing point over-head; and if below, *vice versa*. This is evident, the angle *m*, Z, E being similar to the angle of the pediment *r*, *r*, *r*. The point W is the vanishing point for the pediment *o*, for the same reason above stated.

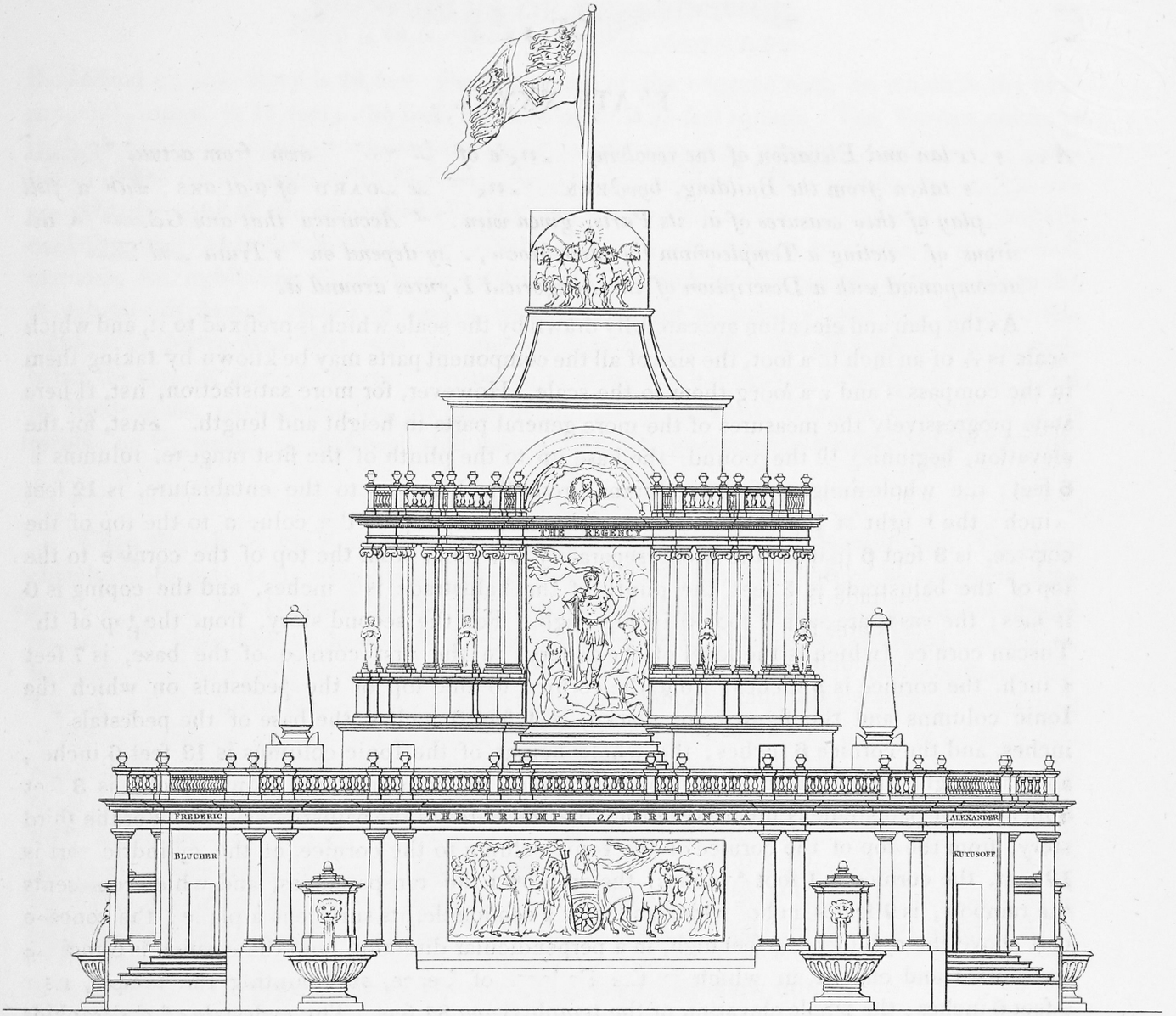
OBSERVATIONS.

In my remarks on Plate XIII. I have spoken against the practice of drawing an object in parallel perspective, having the eye nearly opposite the edge of the drawing, unaccompanied by any other figure: here, I think, the absurdity will, by this example, be made manifest. I have frequently seen views of streets drawn in this manner, representing one of its sides alone, similar to this object ; surely nothing can be more objectionable. If another object was drawn on the right-hand side, between C, D, the view would then appear consistent : but now the observer standing opposite *c*, must positively look askance to see the object ; for were he to turn his head, the object would then decidedly fall into oblique perspective, according to our principle of drawing the plane at right angles to the centre of the picture, which should always be the case. I do not here mean to depreciate parallel perspective, but quite the reverse ; for I have elsewhere shewn the reasons why Nicholas Poussin preferred it, a master who cannot be too closely studied.

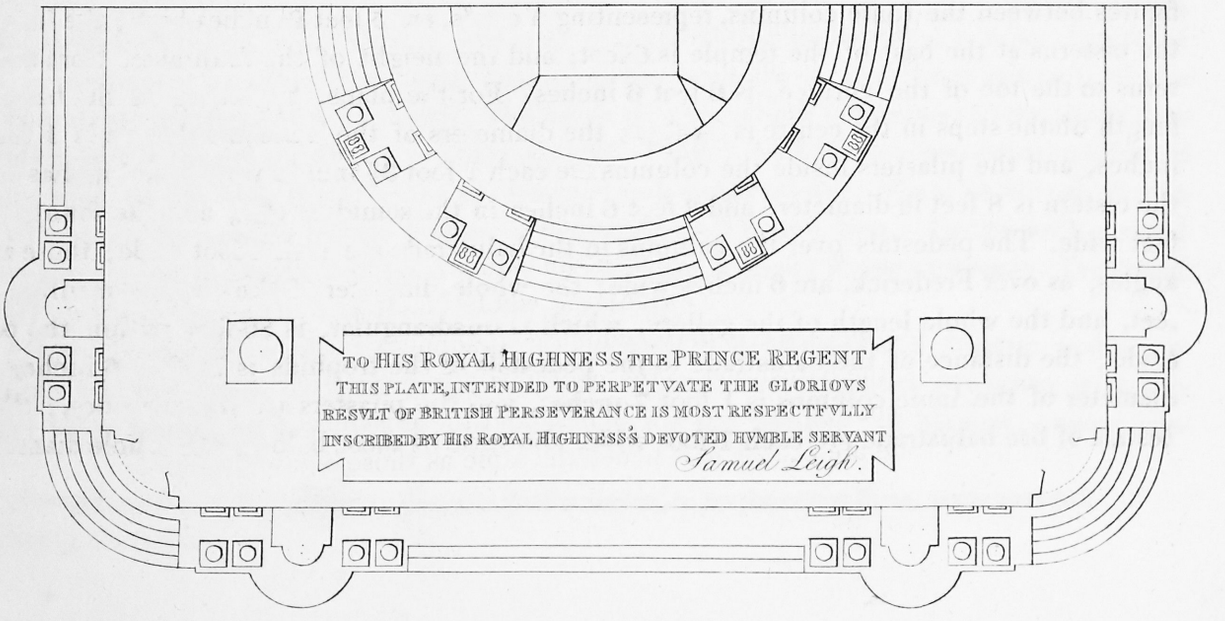
PLATE XXXVIII.

A correct Plan and Elevation of the revolving Temple of Concord, drawn from actual Measurements taken from the Building, by PERMISSION *of the* BOARD *of* WORKS; *with a full Display of the Measures of all its Parts, given with such Accuracy, that any Gentleman, desirous of erecting a Temple from the same Model, may depend on its Truth and Exactness: accompanied with a Description of the Allegorical Figures around it.*

As the plan and elevation are carefully drawn by the scale which is prefixed to it, and which scale is $\frac{1}{16}$ of an inch to a foot, the size of all the component parts may be known by taking them in the compasses and applying them to the scale. However, for more satisfaction, I shall here state progressively the measures of the more general parts in height and length. First, for the elevation, beginning at the ground: the base up to the plinth of the first range of columns is 6 feet; the whole height of the columns, from the base up to the entablature, is 12 feet 1 inch; the height of the entablature, namely, from the top of the column to the top of the cornice, is 3 feet 6 inches, the frieze separately is 1 foot; from the top of the cornice to the top of the balustrade is 3 feet, the plinth of the balustrade is 9 inches, and the coping is 6 inches; the vases are each 1 foot 6 inches high. For the second story, from the top of the Tuscan cornice (which is the level of the gallery) to the first cornice of the base, is 7 feet 1 inch, the cornice is 9 inches; from the cornice to the top of the pedestals on which the Ionic columns and the figures are placed, is 4 feet 6 inches, the base of the pedestals is 9 inches, and the cornice 6 inches; the whole height of the Ionic columns is 13 feet 6 inches, and the height of the entablature, from the top of the column to the crown mould, is 3 feet 3 inches; the balustrade is precisely of the same measures as the balustrade below. For the third story, from the top of the cornice of the Ionic column to the cornice of the cylindric part is 13 feet, the cornice is 1 foot 4 inches; the arch over the transparencies, and which represents the rainbow, is 2 feet 9 inches wide, and rises a semicircle, its surface is a plane; the concave part above the cylinder is 8 feet high, in a perpendicular direction, and the cornice is 6 inches; the horses and chariot, in which is the Goddess of Peace, surmounting the temple, rises 8 feet 6 inches; the whole elevation of the temple rising 82 feet. The pedestals of the trophids are each 5 feet 11 inches high, and the trophids are each 13 feet 6 inches high; the statuary figures between the Ionic columns, representing Vestals, are 5 feet 9 inches high; the height of the cisterns at the base of the temple is 6 feet; and the height of the fountains, from the cisterns to the top of the cornice, is 6 feet 6 inches. For the plans, beginning at the base, the length of the steps in the centre is 34 feet; the diameters of the Tuscan columns is 1 foot 10 inches, and the pilasters inside the columns are each 1 foot $3\frac{1}{2}$ inches wide and 4 inches thick; the cistern is 8 feet in diameter, and 3 feet 6 inches in the semidiameter, and the fountain is 5 feet wide. The pedestals over the columns in the balustrade are each 1 foot wide; those in the angles, as over Frederick, are 6 inches wide; the whole diameter of the circular pavilion is 52 feet, and the whole length of the gallery, which is quadrangular, is 86 feet within the balustrade; the distance of the balustrade to the pedestals of the trophids is 10 feet 6 inches; the diameter of the Ionic columns is 1 foot 7 inches, and the pilasters are in proportion; the pedestals of the balustrade are each 1 foot wide, the same as those below; the whole diameter of



Scale of 1 0 5 10 20 30 40 50 feet.



TO HIS ROYAL HIGHNESS THE PRINCE REGENT
THIS PLATE, INTENDED TO PERPETUATE THE GLORIOUS
RESULT OF BRITISH PERSEVERANCE IS MOST RESPECTFULLY
INSCRIBED BY HIS ROYAL HIGHNESS'S DEVOTED HUMBLE SERVANT
Samuel Leigh.

Drawn by R. Brown. London, Printed for Samuel Leigh, 18 Strand, Aug.st 2nd 1814. Engraved by T.L. Busby.

the second circular story is 28 feet; the top width of the concave part, on which is the chariot and horses, is 12 feet; the base of the temple is 97 feet square. The Tuscan columns in the lower quadrangular compartment of the temple represent porphyry, and the Ionic columns in the circular part of the edifice above, Sienna marble. This temple, when first exposed to the sight of the spectators at night, was covered with canvas, painted so as to represent a grand military fortification, and which was afterwards stormed by artillery, small arms, maroons, &c. exhibiting all the terrors of a siege; on a sudden this ceased, and, in the midst of volumes of flames, clouds of smoke, and the thunder of artillery, the lofty fortress, the emblem of destructive War, was transformed into a beautiful temple highly illuminated, being the type of glorious Peace. To assure to every one a complete view of this edifice and its decorations, notwithstanding its great height and dimensions, it was so constructed as to revolve on its centre, so that each side was successively presented to the assembled company.

REMARKS.

Upon the whole, the proportions of this temple appear to be very harmonious. The most objectionable part is its termination, which is a square figure rising out of an irregular octagon, on which the Goddess of Peace is seated in a painted chariot: but if the horses and chariot had been alto or basso relievo, that objection would have been obviated. There is, however, one very great error in the construction of this temple, which is, the adoption of the Tuscan order in the quadrangle, instead of the Doric. Whenever a public building, consisting of different stories, has the five orders of architecture introduced, they ought to be thus disposed:—To the base, or first story, the Tuscan; to the second, the Doric; to the third, the Ionic; to the fourth, the Corinthian; and to the fifth, the Composite*. The plan and elevation, which are here perfectly exact according to actual measurement, differ somewhat from the original measures, as stated in the Program: this I suppose is in consequence of the unavoidable deviations which are frequently made by workmen, from local circumstances, as in the elevations of buildings in general. This observation will apply to all architectural designs.

DESCRIPTION OF THE TRANSPARENCIES.

On the south side, within the rainbow, is a portrait of the King of Prussia; and below it is inscribed the words, STRIFE DESCENDING. Strife, as described by the ancient poets, is represented expelled from heaven, and sent to excite dissensions among men: Jupiter is seen, accompanied by other Divinities, dismissing her from above, and the inhabitants of the earth are flying terrified at her approach. The lower picture, which is a sequel to the above, has inscribed over it the words, WAR DESOLATING THE EARTH. It represents the effect of her descent: on one side the Cyclops are forging implements of war; Mars, in his car, driven by Bellona and hurried on by the Furies, is overturning all before him. In the back-ground are seen towns on fire and a desolated plain; in front, are, Charity flying in dismay, Truth and Justice quitting the earth, and Hope lingering behind.

On the west side, within the rainbow, is a portrait of the Emperor of Austria, and below it is inscribed the words, EUROPE RESCUED. Europe is represented struggling with Tyranny: he is tearing off her diadem and trampling on her balance; at his feet, among em-

* If I recollect right, the four last orders, in the Colosseum, or Ampitheatre at Rome, are so arranged.

blems of Religion, Justice, &c. Liberty lies prostrate, and Wisdom, brandishing the fulmen, is descending to the rescue of Europe. The lower picture, which is connected in subject with the above, has inscribed over it, SCEPTRE OF THE BOURBONS RESTORED. In the picture, the Genius of France is restoring the sceptre to the dynasty of the Bourbons, personified by a female seated on a throne in a regal mantle ornamented with *fleurs de lis:* on one side of her, Britannia, Spain, and Portugal, and on the other, Russia, Prussia, Austria, and Sweden, are witnessing the event with delight; a group of subjects are expressing their joy and homage, and Genii are descending with emblems of Peace, Plenty, Justice, Honour, Liberty, Religion, &c. At one end of the composition, Strength is driving out Anarchy, Fraud, and Rebellion; at the other end, Victory is inscribing on a shield the names of the great commanders of the Allied Powers, and Fame sounding her trumpet.

On the north side, within the rainbow, is a portrait of the Prince Regent, and below it is inscribed the words, PEACE RETURNING. Peace is seen in the clouds with her olive branch; Time looks at her with transport, and the Earth hails her return. The lower picture, connected with it, has over it the words, THE GOLDEN AGE RESTORED: the picture represents her reign, or the renewal of the golden age; she is surrounded by Plenty, the Rural Deities, Agriculture, Commerce, the Arts, Minerva, and the Muses.

On the east side, within the rainbow, is a portrait of the Emperor of Russia, and below it is inscribed, THE REGENCY. The picture displays a colossal portrait of the Prince Regent, crowned by Victory; Discord is chained by force to the pedestal; Truth and Justice are returning to earth, and Britannia is looking up to Heaven with gratitude for the blessings of his government. The lower picture has over it the words, THE TRIUMPH OF BRITANNIA. Britannia is in a car of state, accompanied by Neptune with his trident, and Mars displaying the British standard; Fame and Victory attend upon her; she is preceded by Prudence, Temperance, Justice, and Fortitude, and followed by the Arts, Commerce, Industry, and the Domestic Virtues. On the top of the temple, crowning the whole, is the Goddess of Peace: over the south-west entrance are the words, FRANCIS—SCHWARTZENBERG; and at the north-west, THE REGENT—WELLINGTON.

PLATE XXXIX.

A Perspective View of the revolving Temple of Concord, erected in the Green Park, in Commemoration of the grand Results of the Campaign of 1814; *taken by the same Rule as the Monastic Building in Plate* XXVI.

THIS edifice, with its local scenery, being introduced for the purpose of elucidating the elements of colouring, will be seen explained at the end of the work. I shall avail myself of the page which would otherwise be unoccupied, and present the reader with some useful instructions for taking views. Faithfully to delineate the various grand and beautiful scenes which nature presents, is one of the most pleasing employments of human art.

The first thing to be done is attentively to survey the prospect from different stations, that the best point of view may be selected. This being determined on, let the student sketch very slightly on his paper the whole composition, or the outlines of the objects which he means to bring into the picture, and which are contained in the field of vision. The relative situation and proportions of the different objects being thus arranged, rub some crumbs of bread over the penciling until the outline is scarcely visible; and this done, let every error be corrected. Now retrace, in a decided manner, the principal object or leading figure in the landscape. If it be a building, begin with some right line, the side of your tracing-board being your guide: by this you will be able to regulate the other parts of the edifice.

Having drawn the leading objects, proceed with the proper accompaniments. The offices and secondary buildings will here engage your attention. Consider what proportion they bear to the principal edifice, what distance they are from it, or how far they appear above or below it.

If the principal object in the landscape be a tree, begin with sketching the extremities of the limbs, and proceed from the top downwards; then pencil in the intermediate masses or boughs. The trunks of trees, rugged rocks, mouldering ruins, &c. must seem as if they were delineated with a trembling hand: this will give them a picturesque effect. It is a great fault when they appear as if they had been drawn with a rule.

When the principal object is completed, the artist may move from his original station, provided any advantage is gained, or better accompaniments are brought into view: but this licence is only allowed where locality or strict fidelity is not material. The surrounding objects may likewise be brought nearer, or removed farther, at pleasure. Each individual object should, however, be completed at one point of view*.

The figures or cattle which present themselves, should always be accurately drawn on the spot: by this means their true proportions will be preserved. Many artists are too careless in this respect; their figures and cattle are either very slightly sketched at first, or wholly omitted, and afterwards introduced at the caprice of fancy: they are, consequently, very frequently altogether out of perspective and disproportioned to their situations. The remotest and the nearest figures should at least be carefully delineated on the spot: this would be some guide for the proportions of the intermediate figures.

* Where the perspective designs of buildings are introduced into the composition of landscapes, some may be represented parallel and others angular; the first being considered as parallel to the plane of the picture, and the others oblique.

If it be wished to express the height of a building or tree, it cannot be done more effectually than by placing a figure near it, which immediately becomes a scale of comparison. When cattle are sketched from nature, the peculiar spots of colour seen on them should be carefully marked, and likewise the various colours of the different trees. Gainsborough was accustomed to bring home weeds, moss, bark, stones, &c. to study in detail. Mr. Varley does the same; and Mr. Heaphy has various flowers in bottles, fruits, fish, &c. before him when painting. When figures are introduced, it will often be advisable to place some person in the attitude which you wish to delineate, or your figures will not always be natural or well proportioned.

In sketching buildings, or ruins, particular attention is to be paid to the mouldings. Where the profiles or ends of the mouldings are cut off by the abutment of walls or columns, as in the arches and archivaults of Gothic cathedrals, the mouldings cannot be understood by mere outlines: the form of the mouldings must be drawn somewhere across the arch, and the section denoted by hatching strokes above. Clustered columns must be marked in the same manner.

MISCELLANEOUS OBSERVATIONS.

Admit no objects which are not connected with the principal design of your composition. Let the attitudes be natural and graceful, the outline flowing and easy, and each figure carefully balanced on its own centre. When the figures are disposed in groups, let the attitudes be varied; let them not all present the same part of the body; but while the unity of the subject is anxiously maintained, introduce as much variety and contrast as possible. Let the draperies flow freely and gracefully; let the folds be broad; and while the most considerable muscles are visible through the covering, let not the drapery have a tight or scanty appearance. All light bodies must have a sufficient mass or breadth of shadow to support them, while the different shadows should be blended and softened into one another. Let the colours harmoniously blend together, as if they were all laid on at the same time and taken from the same palette.

The effect of the drawing and its fidelity to nature may be judged of by holding it before a mirror. Broad lights should be accompanied by an equal breadth of shadow: this will give the performance a grand effect at a distance. Never admit two equal lights in a picture, and avoid strong shades in the middle of the limbs of figures. Let all objects look, but none stare, is a painter's maxim. Never let two opposite extremes abruptly meet, either in shadow or colour, but let them gradually blend into each other. As a general rule it may be observed, that there should be more shadow than light in a picture; the effect will be thus increased. Whenever an architectural design is made for an edifice which is intended to be carried into execution, the light should always be thrown on the building in the same direction as the sun would shine on the spot, otherwise a false effect will be given to the whole. In learning to draw, the young student must be careful to attend to accuracy before facility, quickness of execution will follow of itself. Sir Joshua Reynolds, in his lectures, frequently inculcated these precepts; and indeed they cannot be too often enforced.

PLATE 40.

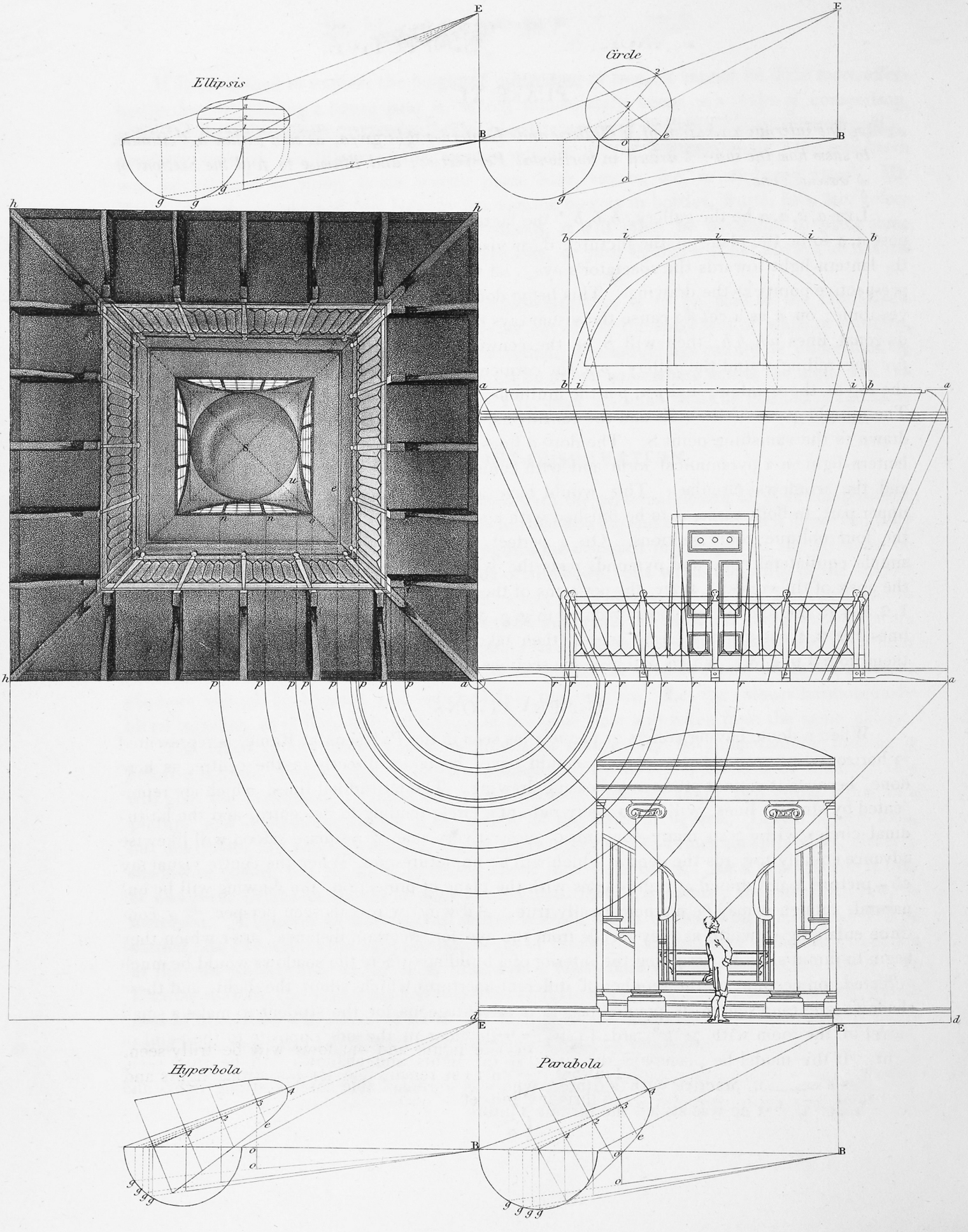


PLATE XL.

Having the internal Elevation of a Gallery and Lantern-Light given, as seen within a Vestibule, to shew how the same is drawn in horizontal Perspective; and likewise to find the Sections of a scalene Cone.

LET a, a, a, a be the gallery, b, b, b, b the lantern-light, and a, a, d, d the vestibule. Suppose a, a to be the plane of the picture: draw visual rays from the angles of the cornice and the lantern-light towards the spectator's eye, and where they intersect the line $a\,a$ will be the perspective points in the drawing. This being done, make a, h, h, h equal to the square of the vestibule; on a as a centre cause the visual rays r, r, r to revolve to p, p, p, &c. and draw the diagonal lines $a\,h, h\,h$; then will S be the centre of the picture, p, t will give a cantiliver, p, c the railing round the gallery, p, e the cornice, p, o the bottom of the sash window, p, u the top of the window, and $p\,n$, $p\,n$ the mullions, which are drawn from n, n to the centre S. The upright parts of the rails and the cantilivers, seen under the railing and at the walls, are drawn to the vanishing point S. The dotted lines i, i, i, &c. suggest a design for finishing the lantern-light in a pyramidical form and with conical windows, instead of its being cubical and the windows circular. This would have a novel and picturesque appearance: the upper part, in both cases, is to be finished with a segment dome. The figures B, B, B, B shew the four oblique conic sections. On a perfect knowledge of this difficult figure, with the simple equilateral cone and pyramid, rests the whole doctrine of perspective. E, E, &c. is the apex of the cones; 1,4, &c. the positions of the pictures. From E produce the lines marked 1, 2, 3, 4 to the line B, which draw down to g, g, &c.; from g, g draw the lines to B, and the lines 1, 2, 3, 4 construct at right angles; then take the length of the lines o, o, &c. and set them from 3 to e, &c. which will give the sections required.

OBSERVATIONS.

When a dome having coffers or pannels (as seen in the Pantheon at Rome) is represented in horizontal perspective, the station should never be taken directly in the centre, as here done, because it cannot produce a pleasing drawing. The latitudinal lines, which are represented by straight lines, will be so many radii of a circle tending to its centre, and the latitudinal circles will be so many concentric ones. Every side of a square saloon will likewise advance equally towards the centre, which will be unpicturesque. When the centre visual ray of a picture is not drawn at right angles with the plane of projection, the drawing will be unnatural, though it may be mathematically true. All window reveals seen perspectively continue enlarging in width as they recede from the eye for a certain distance, after which they begin to diminish. In designing the interior of a building, where the shadows would be much reflected, on account of the number of different apertures which admit the light, and these shadows are represented as penumbras, it is advantageous for the student to make a small model of the room with pasteboard, having a little door in the side opposite to the point of sight. If this model be placed in the sun, all the lights and shadows will be truly seen. This was a common practice with Tintoret, who was so remarkable for his strong lights and deep shadows, that he was styled the furious Tintoret.

PLATE XLI.

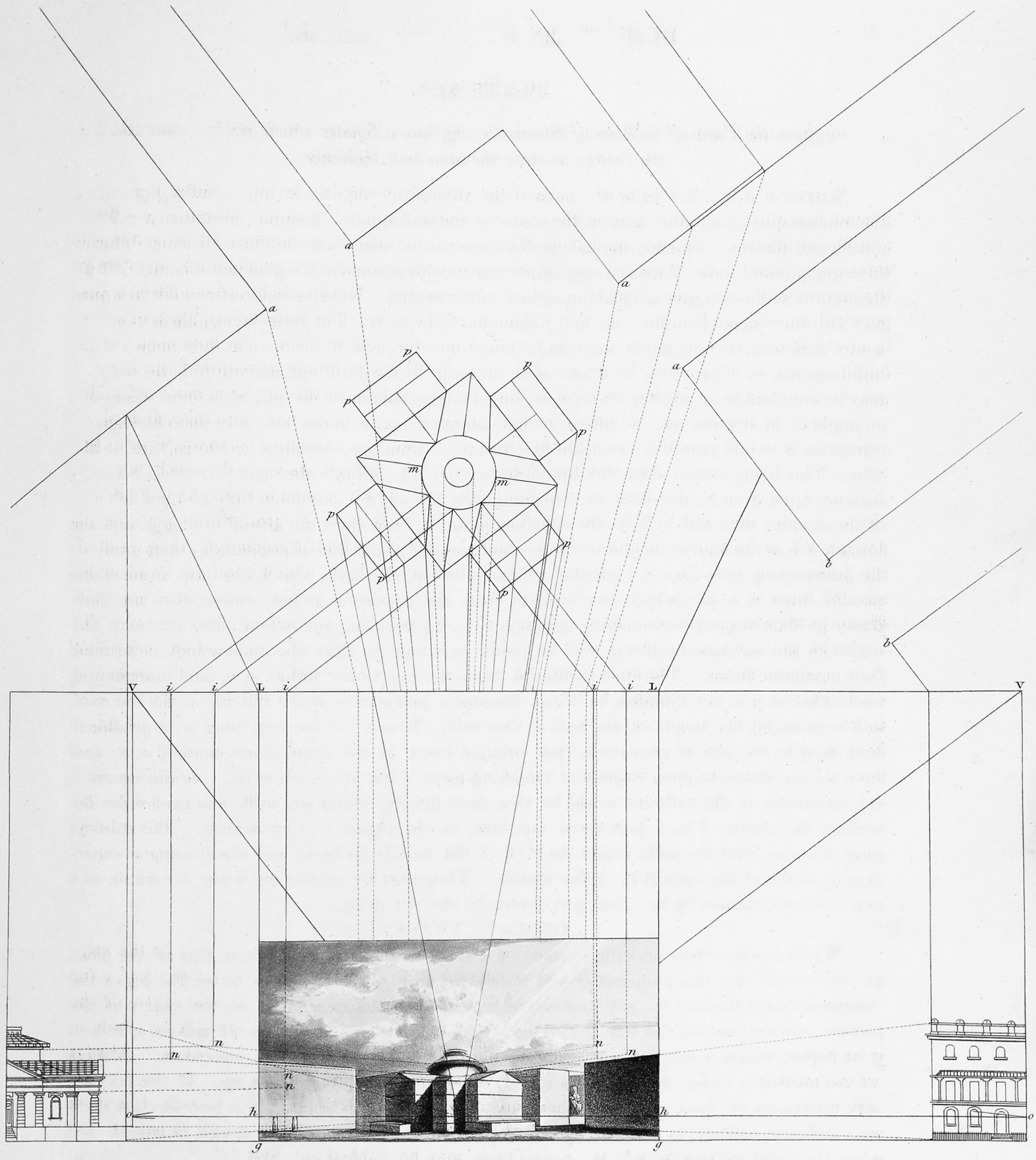
Having given the Plans of a Series of Streets leading into a Square which has a public Bath in its Centre, to draw the same in Perspective.

ADMIT *a, a, a, a, b, b* to be the ends of the streets running into a square, and *p, p, p, p*, &c. the ichnography of a public bath in the centre of the said square. Assume the station point S at a sufficient distance, whence the bath and streets can be seen from the most pleasing and picturesque point of view. This is a very important consideration; for if a good point be not chosen, the picture will never give satisfaction to real connoisseurs. No rules can be given for this purpose; all must depend on the taste and judgment of the artist. The point being fixed, the artist is now to determine how much ought to be taken into the field of vision; i. e. how many of the buildings can with propriety be drawn with the bath. If few buildings are required, the drawing may be confined to an angle of 28 degrees; but if a large portion of the square is more desirable, an angle of 50 degrees may be taken, as here adopted; or, at most, not more than 60 degrees, otherwise it would painfully strain the eye to turn it from one extremity of the picture to the other. This being settled, draw the line of projection LL through the visual lines S L, S L, any distance equal from S; also draw the vanishing lines S V and S V parallel to the right and left side of the square; then will V, V be the vanishing points. Now draw the ground line *g g*, and the horizon *h h*, at the known height of the eye and parallel to the line of projection; then produce the intersecting lines *i, i, i, i, i* parallel to the sides of the bath, which continue to meet the parallel lines *n, n*, &c. which are brought from the elevation below: these lines are then drawn to their respective vanishing points *o, o* in the horizon, and where they intersect the angles of the separate buildings will be points at which to draw the lines which determine their prismatic forms. The lines produced from the two upper letters *n, n*, and intersecting each other at *r* in the cylindric building, become a perspective point directly under the roof, and terminating the height of the wall in that part. If two intersecting lines were produced from *m, m* to the line of projection, and brought down to the upper lines marked *n, n*, and from thence drawn to their respective vanishing points, the place where they would intersect the extremity of the cylinder would be two more points, which are sufficient guides for describing the curve. I have here given but one, as the object is very minute. The student must observe, that the soffit under the roof of the middle building will always appear considerably wider at the ends than in the middle. This must be recollected when the whole of a curve is not obtained by rule, but part drawn by the eye alone.

OBSERVATIONS.

When a perspective drawing is made on a sheet of paper separate from that of the plan, and the visual rays taken separately and transferred to it, the best way is, to set the leg of the compasses each time on the ray you intend to take off, and open them to the centre of the picture, taking that for the transferring point: by this means you will avoid making a hole in your paper, which would otherwise occur, and thus make the measures inaccurate. Always set the measures along the bottom edge of your paper and draw them up. If the rays are very numerous on your plan, and there are many parts to delineate, it is best to class them with different colours, as red, blue, green, &c. or some of them may be drawn in pencil, and when the parts are transferred, the pencil lines may be rubbed out and other parts drawn: all complexity will thus be avoided.

PLATE 41.

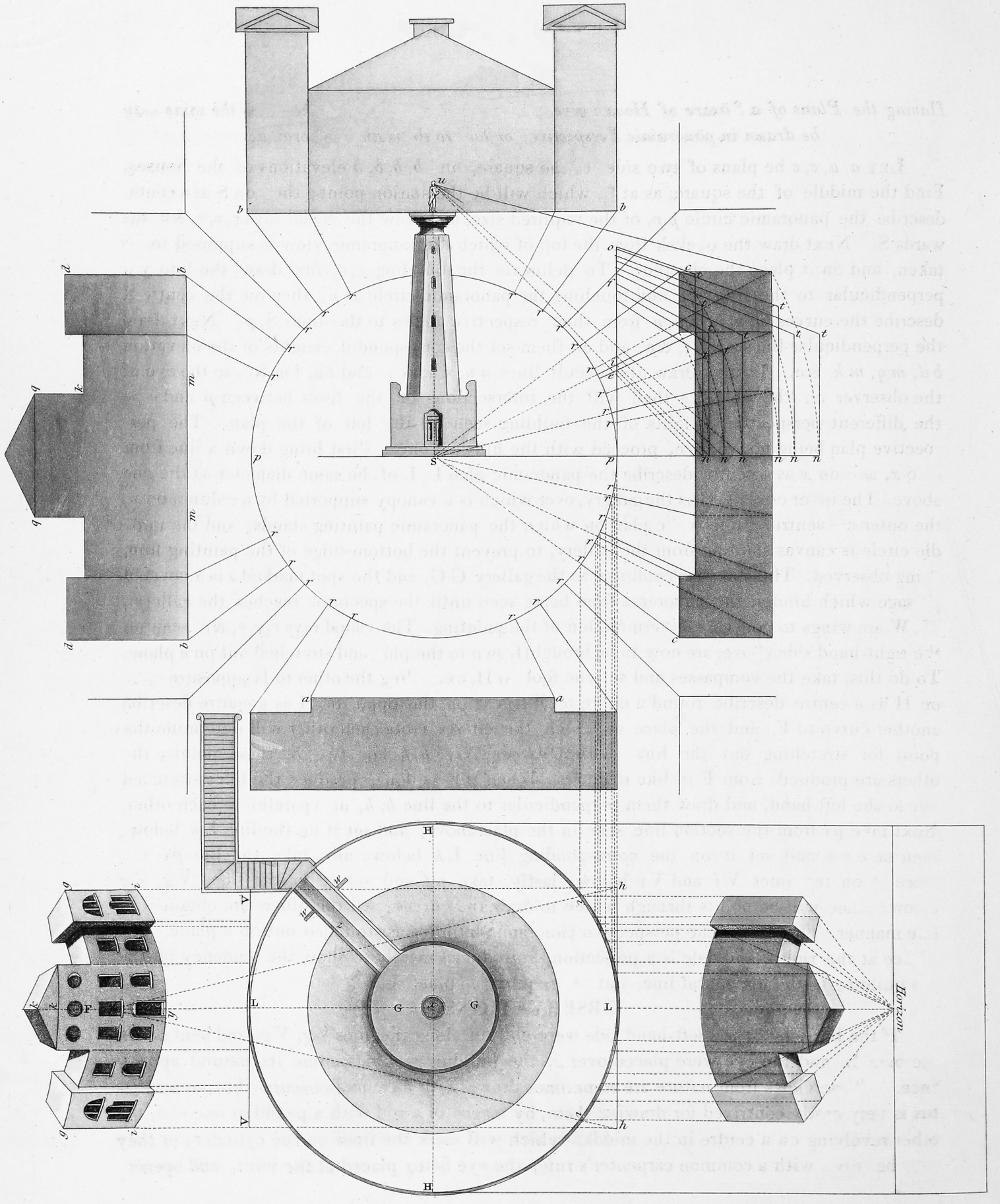


R. Brown del.ᵗ

London Printed for Samuel Leigh 18 Strand, Augᵗ 2ⁿᵈ 1814.

T. L. Busby sculpᵗ

PLATE 42.



R. Brown inven.t

London Printed for Samuel Leigh 18 Strand, Aug.t 2nd 1814.

T. L. Busby sculp.

PLATE XLII.

Having the Plans of a Square of Houses given, with their Elevations, to shew how the same may be drawn in panoramic Perspective; or how to draw any Panorama.

LET *a*, *a*, *c*, *c* be plans of two sides of the square, and *b*, *b*, *b*, *b* elevations of the houses. Find the middle of the square, as at S, which will be the station point; then on S as a centre describe the panoramic circle *p p*, of the required size, and draw the visual rays *r*, *r*, *r*, &c. towards S. Next draw the obelisk from the top of which the panoramic view is supposed to be taken, and on it place the observer. To delineate the building *c*, *c*, first draw the line *p o* perpendicular to the line S *p*, and touching the panoramic circle at *p*; then on the centre S describe the curves *n*, *n*, *n*, *n*, *n*, *n* from their respective angles to the lines S, *p*. Next draw the perpendicular lines *n t*, *n t*, &c. and on them set the corresponding heights of the elevation *b d*, *m q*, *m k*, &c. Lastly, draw the occult lines *n u*, *n u*, &c. and *t u*, *t u*, &c. to the eye of the observer on the obelisk; then will the intersections on the lines between *p* and *o* be the different perspective heights of the building seen on the left of the plan. The perspective plan being now drawn, proceed with the finished one. First bring down a line from S to *x*, and on *x* as a centre describe the panoramic plan L, L of the same diameter as the one above. The inner circle G G is the gallery, over which is a canopy supported by a column on *x*; the outer concentric circle is the plan on which the panoramic painting stands; and the middle circle is canvas slanting from the gallery, to prevent the bottom edge of the painting from being observed. The staircase conducts to the gallery G G, and the spot marked *z* is a covered passage which hinders the panorama from being seen until the spectator reaches the gallery; W, W are wings to conceal the termination of the painting. The visual rays *r*, *r*, *r*, &c. seen on the right-hand side above, are now to be brought down to the plan and stretched out on a plane. To do this, take the compasses and set one foot on H, extending the other to H opposite; then on H as a centre describe round a curve to F; next on the opposite H as a centre describe another curve to F, and the place at which the curves cross each other will determine the point for stretching out the lines seen between *i*, *i*: *h*, *h* are two of these points, the others are produced from F in like manner. When this is done, produce the lines stretched out to the left hand, and draw them perpendicular to the line *h*, *h*, and parallel to each other. Next take *p e* from the section line seen in the plan above, and set it on the line L *y* below; then take *p o* and set it on the corresponding line L *k* below; also take the line *p i* and place it on the lines V *i* and V *i* below; lastly, take *p f* and set it on the lines V *g*, V *g* below: these will be points through which to draw the curves. All the others are obtained in like manner. This shews the perspective panoramic building as stretched out on a plane. The edifice at the right-hand side is a projection, introduced merely to shew the tendency of the top building to the horizontal line, but not required in practice.

OBSERVATIONS.

If the building at the left-hand side were cut out along the lines V *g*, V *g*, and bent round the plan L, and the eye were placed over *x*, the building would assume its natural appearance. These views from nature are sometimes drawn with a camera-obscura; but an apparatus is very easily contrived for drawing them, by means of a rod with a pencil at one end, the other revolving on a centre in the middle, which will mark the lines on the cylinder; or they may be taken with a common carpenter's rule, the eye being placed at the joint, and opening the legs each time to the apparent width.

PLATE XLIII.

A geometrical Design of a Grecian monumental Sepulchre being given, to shew how the same may be thrown into parallel Perspective, the Picture being taken from a spheric Curve, as particularly practised by Joseph Gandy, Esq. A.R.A.

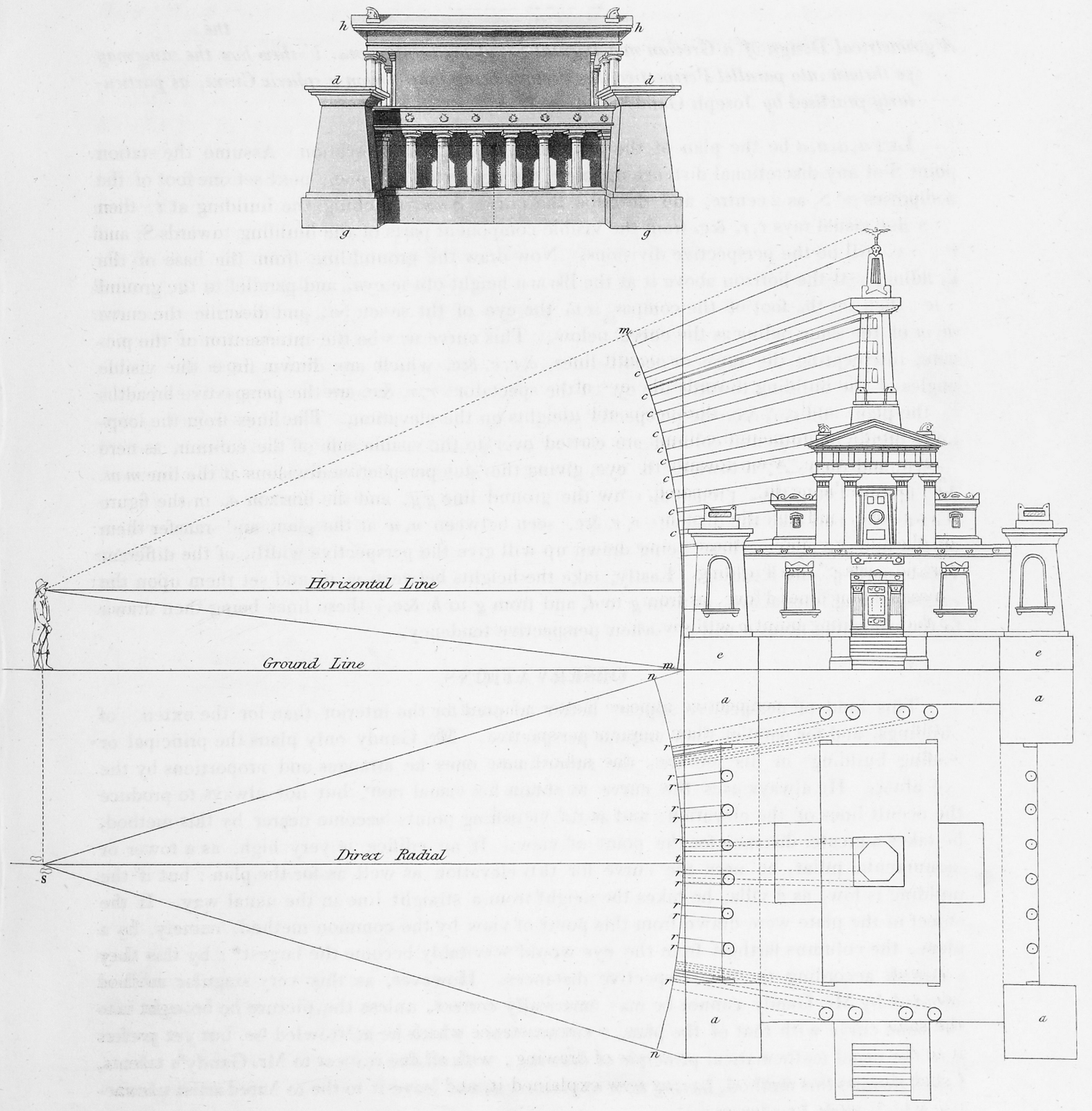
LET a, a, a, a be the plan of the sepulchre, and e, e the elevation. Assume the station point S at any discretional distance opposite the centre of the plan; next set one foot of the compasses at S, as a centre, and describe the curve $S\,n\,n$, touching the building at t; then draw the visual rays r, r, &c. from the visible component parts of the building towards S, and r, r, &c. will be the perspective divisions. Now draw the ground line from the base of the building, and the horizon above it at the known height of the eye, and parallel to the ground line; then set the foot of the compasses at the eye of the spectator, and describe the curve m, m of the same radius as the curve below. This curve will be the intersection of the picture, intercepting the rays, or occult lines, c, c, c, &c. which are drawn from the visible angles of the building towards the eye of the spectator: r, r, &c. are the perspective breadths on the plan, and c, c, &c. the perspective heights on the elevation. The lines from the loopholes of the monumental column are carried over to the visible side of the column, as here shewn, and then drawn towards the eye, giving the true perspective divisions at the line $m\,m$. The picture being thus prepared, draw the ground line $g\,g$, and the horizon o, in the figure seen above, and take the distance r, r, &c. seen between n, n at the plan, and transfer them on the line $g\,g$ above: these being drawn up will give the perspective widths of the different visible parts of the building. Lastly, take the heights between m, m and set them upon the corresponding lines above, as from g to d, and from g to h, &c.; these lines being then drawn to the vanishing point o will give their perspective tendency.

OBSERVATIONS.

This kind of perspective appears better adapted for the interior than for the exterior of buildings, and for parallel than angular perspective. Mr. Gandy only plans the principal or leading buildings in his picture; the subordinate ones he arranges and proportions by the eye alone. He always uses the curve to obtain his visual rays, but not always to produce the occult lines of the elevation; and as the vanishing points become nearer by this method, he takes a greater distance for the point of view. If an edifice is very high, as a tower or monumental pillar, he uses the curve for the elevation as well as for the plan; but if the building is low, as a villa, he takes the height from a straight line in the usual way. If the object in the plate were drawn from this point of view by the common method, namely, by a plane, the columns farthest from the eye would inevitably become the largest*; by this they diminish according to their respective distances. However, as this very singular method adopted by Mr. Gandy cannot be mathematically correct, unless the picture be brought into the same curve with that of the plan, a circumstance which he acknowledges, but yet prefers it to the usual mathematical principle of drawing; with all due respect to Mr. Gandy's talents, I shall dismiss this method, having now explained it, and leave it to the matured artist to practise which mode he pleases.

* For ocular demonstration, see Plate L.

PLATE 43.



Design'd by R. Brown.

London Printed for Samuel Leigh, 18 Strand. Aug.t 3rd 1815.

T. L. Busby sculp.

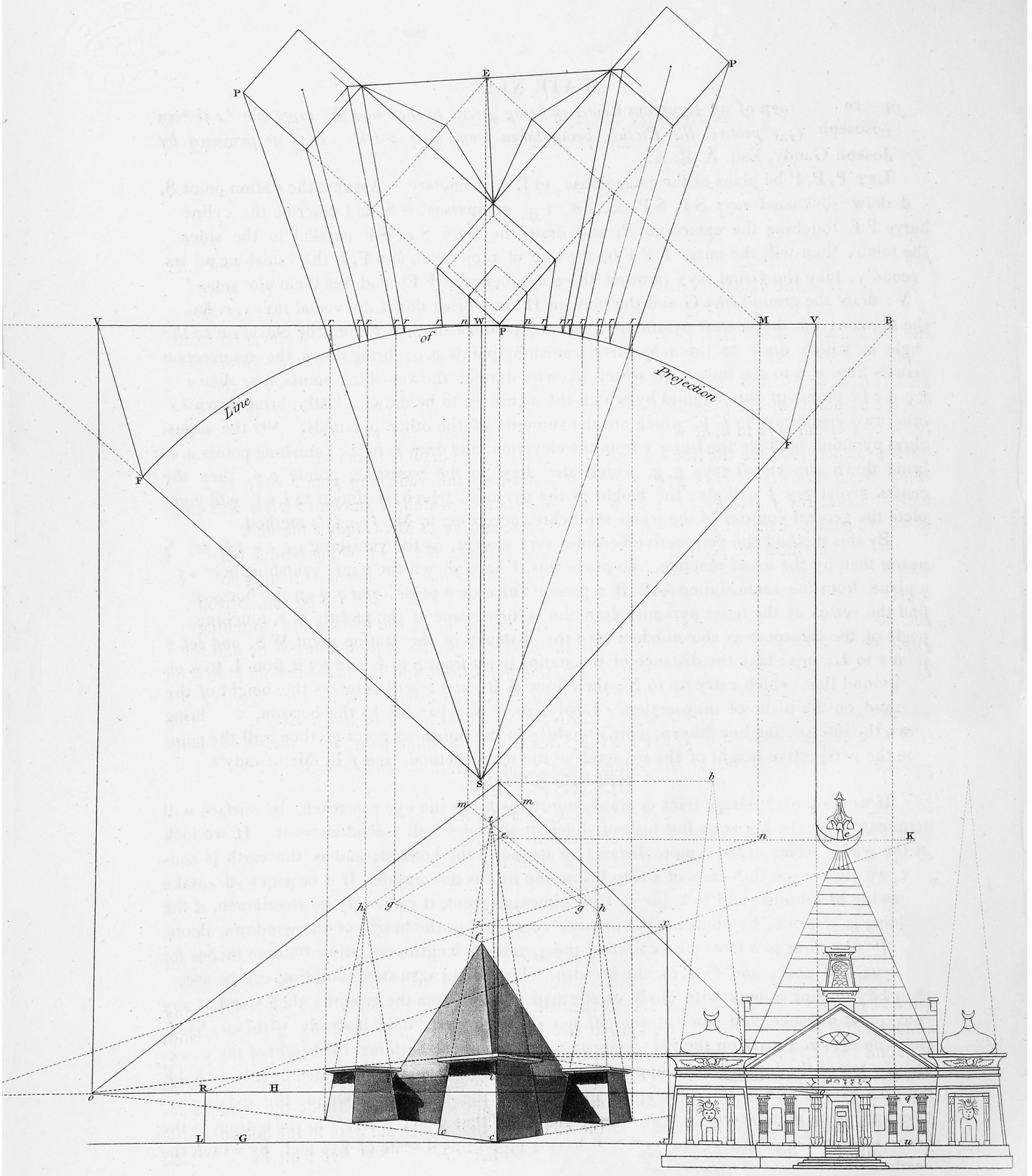

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PLATE XLIV.

A geometrical Design of an Egyptian Cemetery being given, to shew how the same may be thrown into oblique Perspective, the Picture being taken from a cylindric Curve, as practised by Joseph Gandy, Esq. A. R. A.

LET P, P, P be plans of the catacombs, and E the cemetery. Assume the station point S, and draw the visual rays S P, S P, &c.; set the compasses on S and describe the cylindric curve F F touching the catacomb P, and draw the lines S F, S F parallel to the sides of the tomb; then will the curve F P F be the line of projection, and F, F the vanishing points. Secondly, take the visual rays (around the curve between F F) and set them along the line V V; draw the ground line G and the horizon H, and bring down the visual rays *r*, *r*, &c. to the horizon: for the nearest pyramidic frustrum, produce the line *b* from the elevation to the angle *a*, which draw to the respective vanishing points *o*, *o*; bring down the intersecting visuals from *n*, *n* to the line *m*, *m*, which likewise draw to the vanishing points *o*, *o*; then will *t*, *c*, *c*, *c* be points of the pyramid by which the figure is to be drawn: lastly, bring down the other two visual rays to *h*, *h*, which are the summits of the other pyramids. For the sepulchral pyramid, produce the line *e*, *e* from the elevation, and draw it to the vanishing points *o*, *o*; bring down the visual rays *g*, *g*, which also draw to the vanishing points *o*, *o*; then the central visual ray *f* will give the height of the pyramid, which, if drawn to *i*, *i*, *i*, will complete the general contour of the whole sepulchre, according to Mr. Gandy's method.

By this method the perspective becomes very violent, as the vanishing points fall much nearer than by the usual practice. To prove this, I have shewn the usual vanishing points on a plane, from the same station:—B, B represent them on a plane, and *q*, *q* on the horizon: to find the vertex of the inner pyramid, draw the vertical plane of the picture *x*, *x*, touching the angle of the catacomb as above; then take the distance of the station point W S, and set it from *x* to L; next take the distance of the station point from S to E and set it from L to *u* on the ground line, which carry up to K; then draw K R, and *x* will now be the height of the pyramid on the plane of intersection. Lastly, draw *x*, *z* parallel to the horizon, and bring down the intersecting line M to *n*, which produce to the vanishing point *q*; then will the point *z* be the perspective height of the pyramid by the usual method, and *f* by Mr. Gandy's.

OBSERVATIONS.

If we look over a large tract of level country as far as the eye can reach, its surface will terminate with the horizon; but hills of different altitudes will ascend above it. If we look at the sea, it seems in the remote distance to ascend to the horizon; and as the earth is convex, we always see the masts of a ship before the hull is discernible. If it be required to take a drawing of a house, and to know its true admeasurement, it can easily be ascertained, if the building is of brick, by counting the number contained in the height of the windows, doors, &c. allowing four to a foot; also counting their numbers lengthwise, allowing nine inches for the length of each, and four for the breadth. The height of a stone building can be ascertained by making a mark with chalk on the wall five feet from the ground; then stand at any convenient distance, and place an upright rod in the ground; hold it steady with one hand, shut one eye, and mark on the rod the apparent bottom of the building, the height of the chalk, and the top of the building. An approximation to the height may be obtained by merely holding up a pencil, and marking the apparent heights of the chalk, &c. Divide the distance between the mark which corresponds with the chalk and that which answers to the bottom of the house into five equal parts, and you will have a proportional scale of five feet, by which the height above can easily be ascertained.

PLATE XLV.

To draw the Doric Order in Perspective, or any of the other Orders.

LET a, a, a, a be the plano of the capital and entablature, and b, b, b, b the plano of the pedestal and base. Assume the station point S, and draw the line S O; also the line of projection V V; produce the visual rays r, r, r, &c. towards the station point, and the intersecting lines i, i, i, &c. parallel to the side of the plane; draw the geometrical elevation of the capital and entablature, the geometrical elevation of the pedestal, and the horizontal line L L parallel to the projecting line V V, and to it produce the visual rays c, c, c, &c. For the perspective entablature, bring down the intersecting lines i, i, i, &c. to meet the corresponding horizontal dotted lines o, o, o, &c. which are produced from the elevation below; next draw o, o, o, &c. towards the vanishing point L, at the right hand, and where they intersect the visual rays at the principal angle t, t, &c. draw them back to L, the left-hand vanishing point. The mutules and triglyphs are found in the like manner. For the *echinus*, or capital of the column, take the distance S B, and set it along the horizontal line D, E; next measure the distance S R, and set it along the horizontal line E H; then towards E, as a visual point, draw the rays e, e, e from the capital of the column: these lines being drawn parallel to the horizon, to intersect the descending dotted line R, k, will give the perspective thickness of the capital of the column. To find the pedestal, produce lines from the elevation h, h, h, &c. to meet the corresponding descending lines p, p, p, &c.: these lines being drawn from p, p, p to their respective vanishing points L, L, will form the pedestal. To obtain the curve of the bottom of the column, draw the intersecting line m, m, and produce it to the corresponding horizontal line $h\,q$; then from q draw a line to L, on the right hand, and where it intersects the descending visual line $f\,g$ will be a point in the curve. Proceed in the same manner with the other side. To delineate the flutes, describe a curve on the column, form the half square, and draw the diagonal lines d, d; divide d, d into five equal parts, and place two and a half on each side, which being drawn down will give the perspective flutes. To complete the upper part of the column, take E x and set it on the line $z\,n$, which if drawn up will finish the drawing.

OBSERVATIONS.

Columns thrown into perspective become slender, and contain more diameters than the geometrical ones, because their original diameters are not seen while their heights are visible. All cornices increase in depth or thickness, because in perspective we see the soffits of the members, which are not perceived in the geometrical cornices. To complete the flutes of perspective columns, where many are represented, draw the flutes of the largest column on the edge of a slip of paper, which cut to the width of the column, and apply it to the edge of the drawing in a slanting direction, first to the top and then to the bottom of each separate column, observing to keep the ends of the paper at each edge of the column; then mark the divisions on the drawing, and by this means different points in the flutes may be perspectively obtained with sufficient accuracy, and the lines may now be drawn from point to point. Many artists are apt to curve up the base mouldings of their columns too much: this has an unpleasing appearance, and gives a false representation of the original.

PLATE 45.

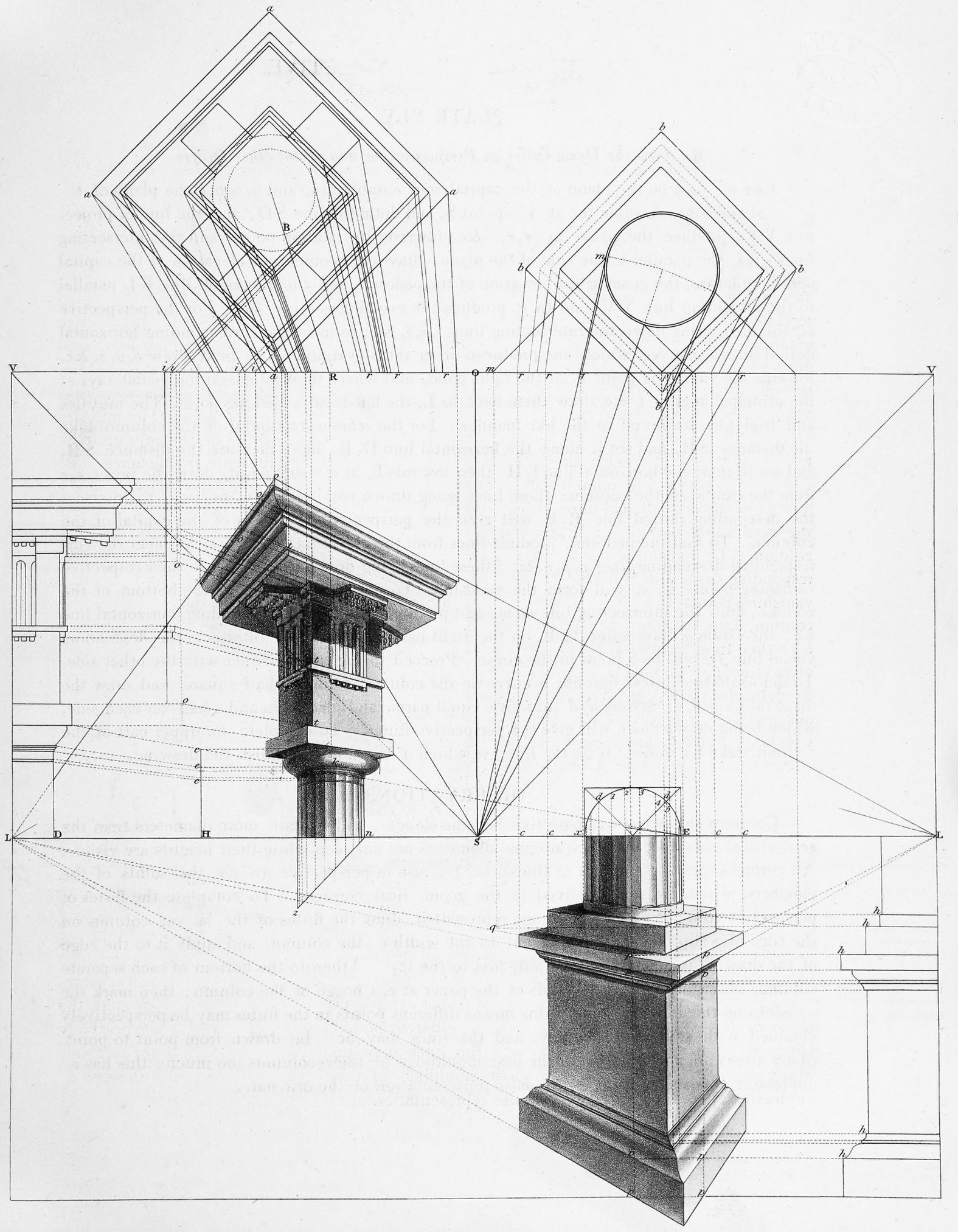

PLATE 46.

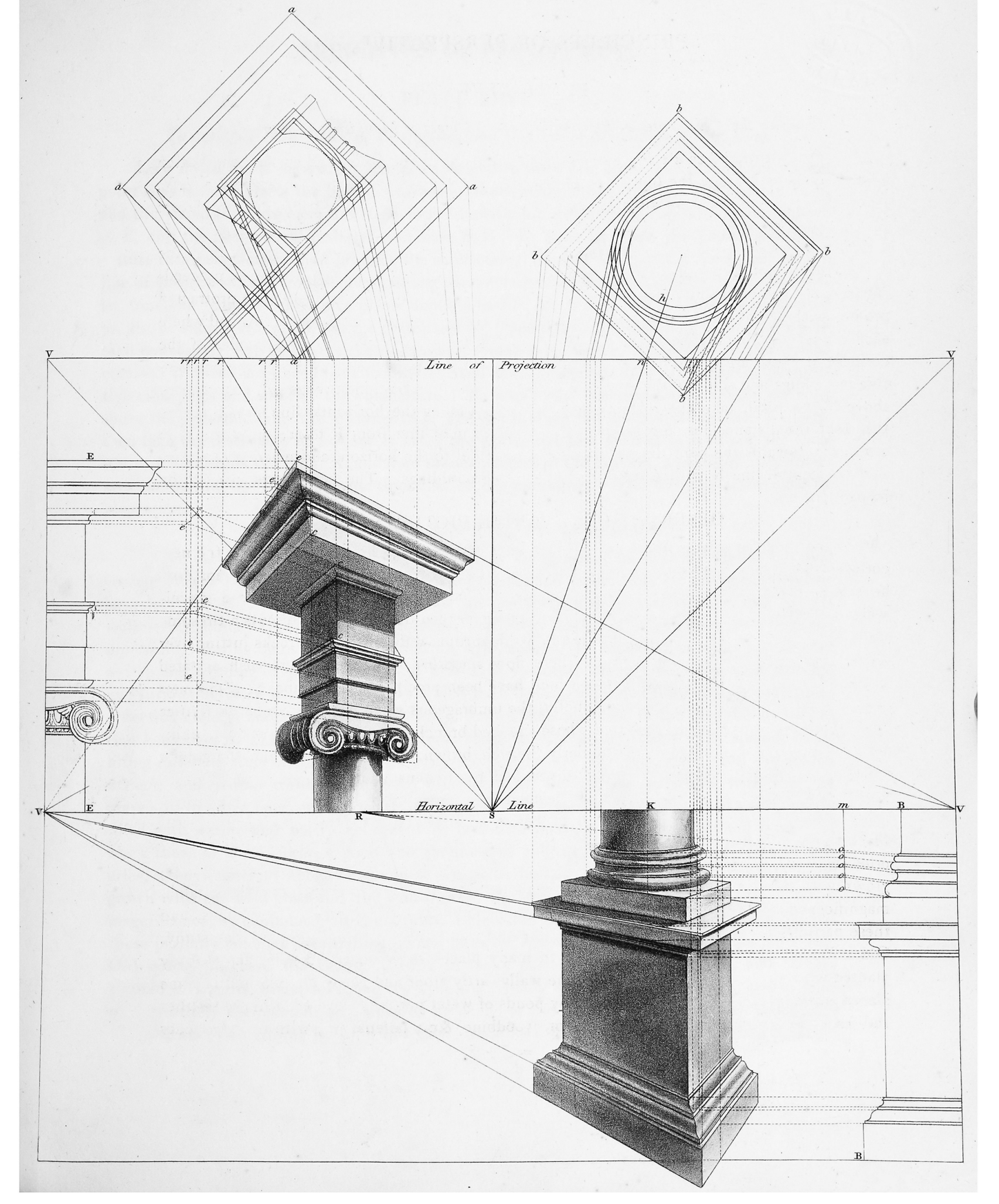
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PLATE XLVI.

To draw the Ionic Order in Perspective, and Cornices or Mouldings of any Kind.

LAY down the plans *a a*, *b b*, &c. as explained in the Doric order, and assume the station point S as before. Draw the line of projection, the horizontal line, the vanishing points V, V, and the visual rays, as there directed; form likewise the geometrical capital and entablature E, E, and the geometrical pedestal and base B, B. In order to throw the capital and entablature into perspective, first produce the intersecting lines of the cornice *r*, *r*, *r*, &c. to the line of projection, and from thence prolong them to meet the horizontal dotted lines, proceeding from the geometrical cornice below denoted by *e*, *e*, &c. This will constitute a protracted profile, as shewn at *e*, *e*. From *e*, *e* draw lines to V, the right-hand vanishing point, and where each converging line intersects the descending visual rays, as *c*, *c*, &c. will be angles of the cornice: if these are traced back to the left-hand vanishing point, they will give the perspective mouldings and soffit of the entablature. To obtain the base mouldings which are seen above the pedestal, take the distance S *h*, and set it along the horizontal line from B to R; then take the distance *g n*, and set it along the horizontal line from R to *m*; draw the lines *o*, *o*, *o*, &c. towards the point R, and from thence parallel to the horizon, and where they intersect the central line K will be the thickness of the mouldings. The other parts are clear by inspection.

OBSERVATIONS ON THE PICTURESQUE.

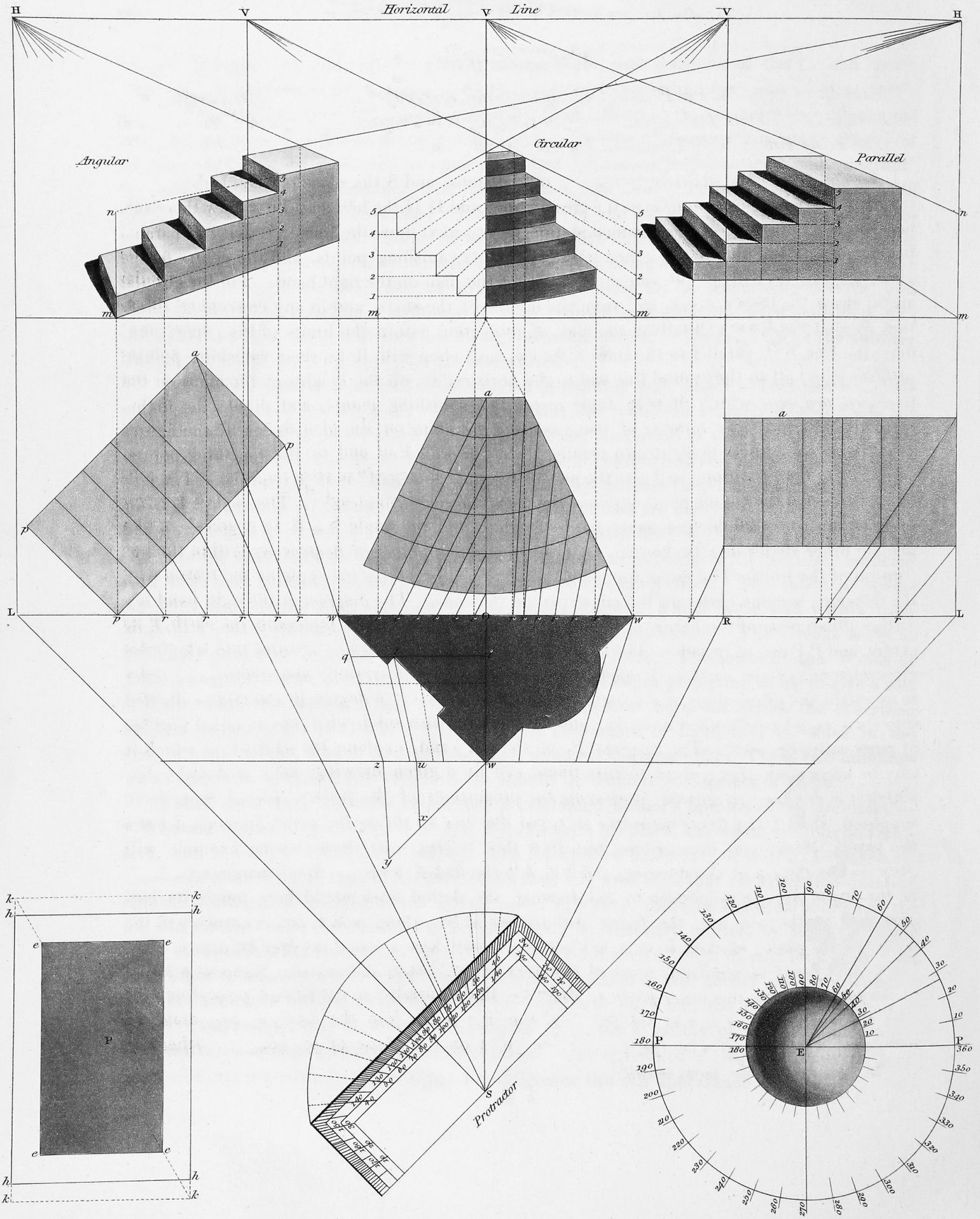
When an artist selects from nature fit subjects for painting, he does not choose the neat cottage villa or new mansion, whose angles are regular and whose tints are uniform; nor does he select the artificial garden, where trees are curiously cut into statues, whose gravel-walks are tediously regular and monotonous, and every feature of which presents a tiresome uniformity: but he takes what is picturesque, wild, abrupt, and romantic, as rocks jutting over a deep and winding river, whose waters here flow smoothly along, and there rush agitated and furious between the broken masses which have been precipitated from above; sometimes reflecting clearly, and sometimes indistinctly, the umbrageous wood or the irregular declivities that hang over it. He chooses a tree whose crooked branches are fantastically spread, exhibiting different tints of foliage, particularly the rich brown, the deep green, and the golden orange, and whose trunk is irregular, diversified by lichens and entwined with ivy. A gravel-pit in a bye lane, or on a heath, variegated with layers of clay, flint, and earth, partly filled with water, and partly concealed by broom or furze, with a few scattered bushes of black thorn or hazel, forms a good and picturesque subject. The mouldering ruins of priories, abbeys, ancient theatres, temples, &c. with broken cornices and battlements overgrown with the wild grass and the wall-flower; the ground strewed with fragments of fallen magnificence, as capitals, broken columns, time-eaten sculpture, and carved mouldings, and these partially covered with trailing plants, likewise constitute a pleasing and sublime study. Old cottages, where the thatch is sunk in many places between the rafters, and thickly planted with moss, house-leek, and ivy; the walls partly stone and partly plaster, and in some places entirely dilapidated; accompanied by ponds of water partially covered with water-lilies and bulrushes, overhung by elder in bloom, woodbine, &c.; fallen trees, with their branches

irregularly lopped off, and children playing around them, also waggons of timber and loaded carts, properly belong to rustic scenery. Cottages are no less admired for the simplicity of their construction than for being often embosomed in trees; their roofs are generally of unequal heights and seen in different degrees of perspective, with a pleasing variety and intricacy of outline: the fronts are diversified by open casements and suspended bird-cages; and sometimes by antique porches, terminating with pediments supported by corbels, and covered with Gothic figures of rude workmanship; while the ends of the cottage are varied by sheds, projecting chimnies, and ovens. Some of the old English mansions, where the shafts of the chimnies are clustered together or formed into angles, or rising separately, but joining at the top and admitting a beautiful play of outline, with zig-zag bricks resembling cornices and belts, are really picturesque. Although I have pointed out what an artist considers picturesque, yet these are not fit subjects for the historical painter. He must adopt the sublime and perfect buildings of antiquity for his accessories.

Few of our modern roofs can be introduced in painting with effect. This part of architecture seems to be little regarded. In towns where the roofs can scarcely be seen, it is not material; but in the country, where the whole building is exposed to view, and that from various points, some attention should be paid to the general contour and decoration of the summit. The surfaces of slanting roofs are extremely disgusting, because they have no variety of light and shadow; but in some cathedrals where the sheets of lead are narrow, with frequent ridges, a pleasing effect is produced. Some farm-houses in Devonshire, where the upper windows run into the roofs, and are surmounted with pediments terminating with pantiles, bordered with rude and fantastic ornaments, have a very picturesque effect. The mode of covering with semicircular tiles practised in the Lower Empire, which were laid within each other and gave a fluted appearance to the roof, was not unpleasing. The Greeks seem to have paid particular attention to the decoration of their roofs. The tower of the Winds at Athens is covered with slabs of marble, whose horizontal edges projecting so as to give a sort of shade, while the vertical joints are so elevated as to form high ribs, break the otherwise uniform surface in a very beautiful manner. The monument of Lysicrates is roofed in the form of laurel-leaves, which, in a different way, produces the same effect. These two buildings are so admirable in their kind, that no artist should be without good prints of them.

I shall close these hints by submitting a celebrated author's opinion of an architect:— "Whoever wishes his buildings to be real decorations to his place, cannot do without an architect; not, indeed, a mere builder, but one who has studied landscape, as well as architecture; who is no less fond of it than of his own profession, and who feels that each different situation requires a different disposition of the several parts: in reality, this consideration points out the use and greatly exalts the character of an architect. It is an easy matter, by means of some slight changes in what has already been done, to make out such a design as may look well upon paper; but to connect with correct design such a disposition as will accord not only with the general character of the scenery, but with the particular spot and the objects immediately round it, and which will present from a number of points a variety of well combined parts, requires very different and very superior abilities. The difference of expence between good and bad forms is comparatively trifling; the difference in their appearance immense."

PLATE 47.



R. Brown invent.

London Printed for Samuel Leigh 18 Strand, Aug.t 2nd. 1814.

T. L. Busby sculp.

PLATE XLVII.

To draw Flights of Stairs in Perspective, either parallel, angular, or circular; to ascertain the Angle of View; to find whether a given Drawing is in Proportion to a given Frame; and to draw any visual Ray after the Station Point is removed.

LET *a, a, a* be the plans and positions of the steps, and S the place of the observer; L L the regular line of projection, *m m* the ground line, and H H the horizon. First draw the visual rays *r, r, r*, &c. towards S the assumed station point; next draw the lines S L and S L parallel to the sides of the plan *p, p, p;* then will L L be its vanishing points, and the centre of the view, marked O, will be the vanishing point for the plan on the right hand. For the circular stairs, draw the lines *c, c, c, c*, &c. from the middle of the steps, and in any convenient direction so that the lines will fall on the line of projection within the limits of the paper: next draw the line S R parallel to the lines *c c* or *c a*, &c.; then will R be their vanishing points: produce them all to the ground line and to the horizon; set up the heights of the steps on the lines *m n, m n*, &c. which draw to their respective vanishing points, and divide the flights regularly into the same number of risers as there are steps on the plan shown by the figures 1, 2, 3, 4, 5, &c.; these being drawn parallel to the ground line and to the vanishing points, according to their positions, will give the perspective appearance of the steps required.—The protractor shewn at the station point explains the nature of measuring angles. The angle S L L, for instance, measures 90 degrees, as the figure denotes; and the angle S L R 18 degrees: in like manner other angles may be known, by observing what number of degrees are within the expansion of the lines. The circle touching the angles of the protractor explains the reason why the divisions become closer on the edge than on the ends. The diagram at the right hand is a further illustration of the nature of the degrees. The shadowed globe represents the earth, E its centre, and P P one of its poles. The figures around the great circle are measures into which the circumference of the earth is divided, which measures are universally assented to. In order to ascertain the dimensions of an angle with greater accuracy, a degree is sometimes divided into sixty equal parts called minutes, and each minute also subdivided into an equal number of parts called seconds.—The diagram P, on the left hand, explains the method by which it may be known whether a given picture-frame will fit a given drawing, on a less scale, but which it is designed to enlarge, preserving the proportions of the different parts. Some have supposed, that if the frame measures an equal distance all round the given drawing, it bears the same proportional dimensions; but that this is erroneous the following example will shew:—Let *e, e, e, e* be the drawing, and *h, h, h, h* the frame, with an equal margin all round. If the frame were in proportion to the drawing, the dotted lines would here touch its corners, but as they do not, the frame will require to be as long as *k, k*, &c.—The plan in the centre of the plate, marked *w, w, w*, is inserted to shew how a visual ray may be drawn when the station point is removed, some of the rays being already delineated. Suppose a visual ray is required from the inner angle *t;* draw the line *t i* parallel to the line of projection, and take the distances *q, t, i*, and set them on the line *w x y;* join the line *y z*, and draw *x u* parallel to it: then will *u* be the perspective point on the plane of projection. Other rays may be obtained in the same manner.

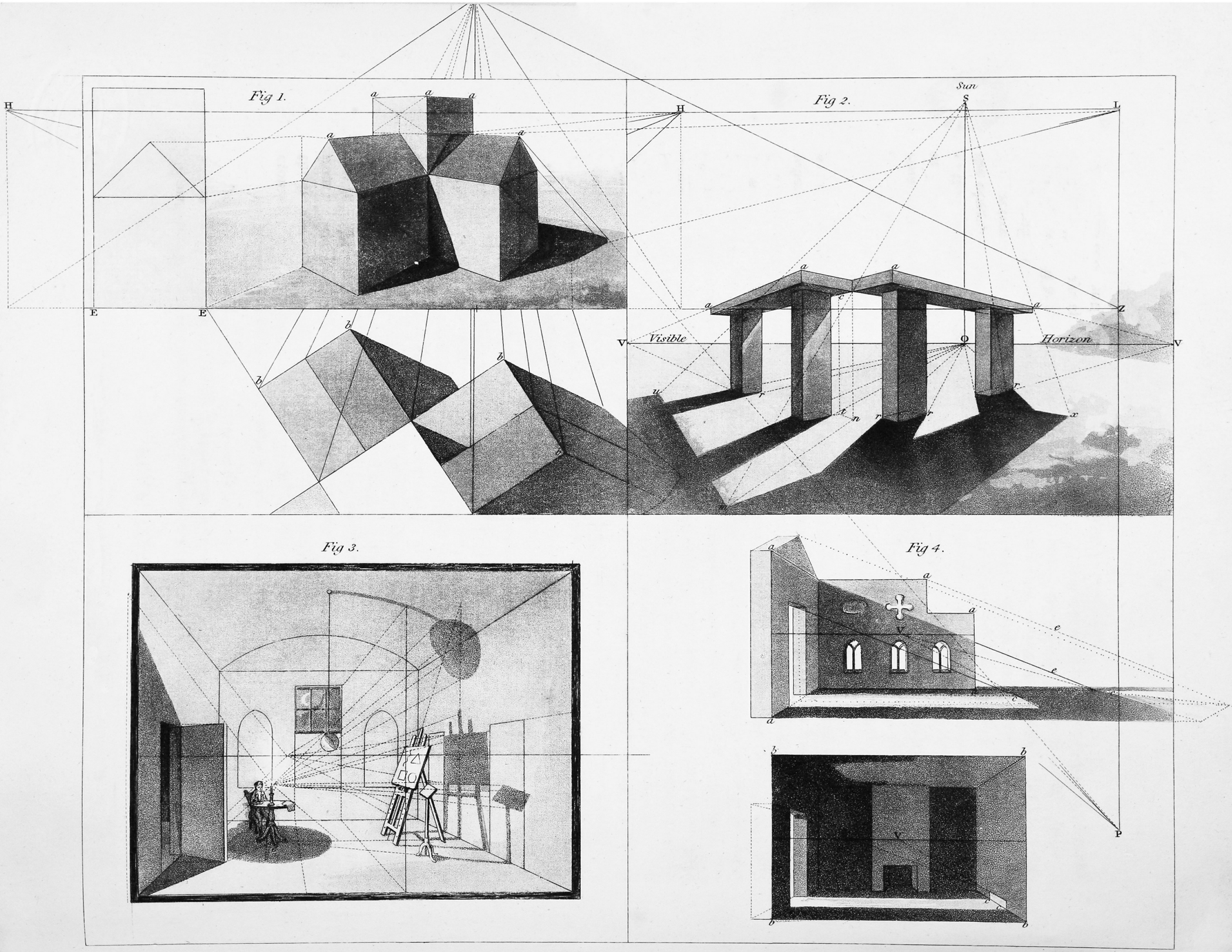
PLATE XLVIII.

To cast the Shadows of Objects from three given Positions of the Sun; namely, when represented in the Picture, parallel to the Picture, and shining obliquely against the Picture; also to project the Shadows of Objects produced by a Candle, within a Room.

When the sun is as represented in the picture, let *a*, *a*, *a*, &c. fig. 2. be the view of a cromlech, and let S be the elevation of the sun. First let fall a perpendicular from the sun to the horizontal line; and from the vanishing point O of the sun produce lines along the ground from the different vertical angles of the object, as *r*, *r*, &c.: next draw the line *c c* to the edge of the transverse stone, which bring down to *t*, and from V, the vanishing point on the left hand, produce *t* to *n;* then from the vanishing point of the sun O draw *n m*, which lines also draw from *m* to V V: lastly, from the sun S draw the lines *e u*, *e u* from *e* the innermost corner of the stone, and the lines *u m* and *u x* produce from V, this will give the shadow of the cromlech required.—When the sun is parallel to the picture, let *a*, *a*, *a*, &c. fig. 4. represent a fragment of Gothic ruin, and *b b* a room. First draw the parallel lines *c*, *c*, &c. from the open doors and angles of the building; next draw lines according to the sun's inclination, as *e*, *e*, &c. and where they intersect the ground lines *c*, *c* produce others to the vanishing points V, V, which will give the terminations of the shadows on the ground plane and on the wall.—When the sun shines obliquely on the picture, let *a*, *a*, *a*, &c. fig. 1. be the simple form of a cathedral, *b*, *b*, *b* the plan, E, E the elevation, and H, H the horizon. First choose the direction of your shadow on the ground; suppose L to be its vanishing point, then draw a line from S to the line of projection E Z, seen directly under L in fig. 2.; next take the length of the line Z S, and set it from L downwards to P; then will L be the vanishing point whereby to draw the shadows on the ground plane, and P the point by which to determine their boundaries. These simple methods will apply to all objects whatever, and render more examples unnecessary.—To cast the shadows of objects from a candle, suppose fig. 3. to be a painting-room, from the ceiling of which is suspended a globe; on one side are seen a painter's easel and a book-stand, on the other side a table on which stands a candle. First draw a perpendicular line from the candle to the floor *e*, and from *e* produce lines to the foot of the objects, and where the lines intersect the wall draw others perpendicular; then if lines are drawn from the candle to the upper parts of the objects, to intersect the perpendicular lines, they will determine the different shadows.

OBSERVATIONS.

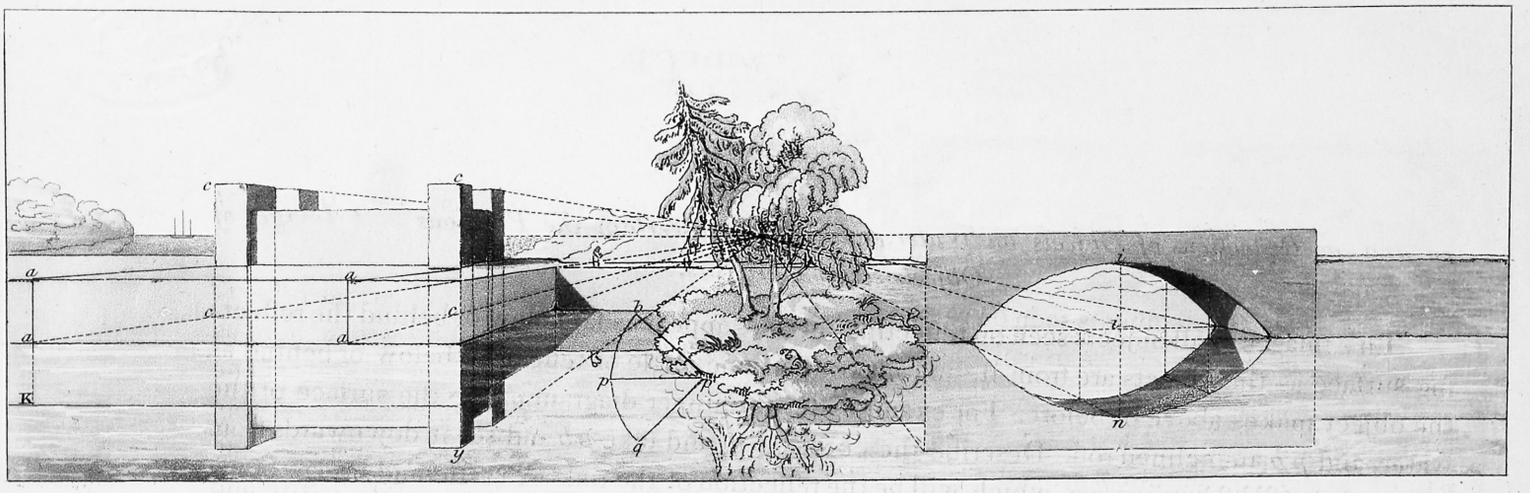
When the sun is in the plane of the picture (which can only be for a moment), the rays emanating from it are parallel to each other. When the sun is behind the plane of the picture, and becomes an object of imitation, the rays will diverge in every direction, and the sun will in that case become a vanishing point. When the sun is before the picture, the shadow of the observer's head, seen on the ground, will be the vanishing point of the rays: it is also the perspective centre of the rainbow. The rays of the sun in this position are only seen under very peculiar circumstances, as on looking towards a city whence the smoke is rising towards a cloud, &c. When wheels are drawn in perspective, the upper and lower vertical parts of the rim will always appear wider than their sides. This is not sufficiently attended to by many artists, who frequently make them of equal breadth in every part.



R. Brown delt.

London Printed for Samuel Leigh, Strand, Augst 1st 1814.

T. L. Busby sculpt.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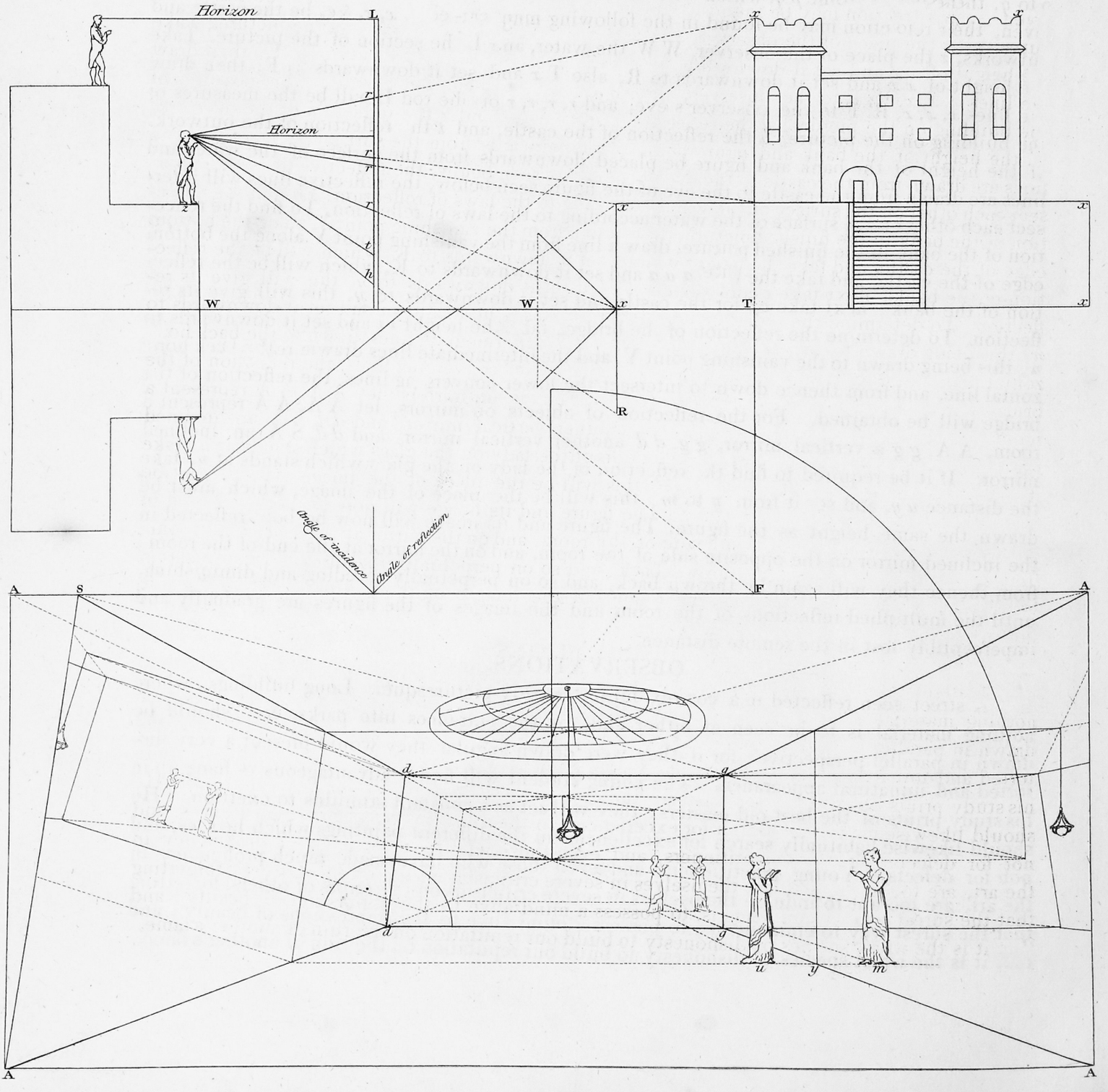
Horizon
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PLATE XLIX.

To find the Reflections of Objects on Water, and also to ascertain the Positions and Images of Objects seen on Mirrors.

THE images of all objects seen on reflecting surfaces appear as far below or behind the reflecting surface as the objects are from it, and make the same angle of reflection below or behind as the object makes above or before. For example, let the upper diagram *p p* be the surface of the water, and *p b* an inclined rod. Describe the curve *p b q*, and take *p b* and set it downwards from *p* to *q;* then draw the line *p q*, which will be the reflection of the rod. A castle and bridge being given, their reflection may be found in the following manner:—Let *x*, *x*, &c. be the castle and outworks, *z* the place of the observer, W W the water, and L the section of the picture. Take the height of *x x* and set it downwards to R, also T *x* and set it downwards to F; then draw the lines *x*, *x*, *x*, R, F to the observer's eye, and *r*, *r*, *r*, *r* on the rod L will be the measures of the building on the picture, *h* the reflection of the castle, and *t* the reflection of the outwork. If the height of the bank and figure be placed downwards from the surface of the water and lines are drawn from the castle to the eye of the figure seen below, the reflective lines will intersect each other on the surface of the water according to the laws of reflection. To find the reflection of the bank in the finished picture, draw a line from the vanishing point V along the bottom edge of the castle, and take the height *a a* and set it downwards to K, which will be the reflection of the bank; next take *c c* for the castle and set it downwards to *y*, this will give its reflection. To determine the reflection of the bridge, take the height *i i* and set it downwards to *n;* this being drawn to the vanishing point V, and the intermediate lines drawn to the back horizontal line, and from thence down to intersect the lower converging lines, the reflection of the bridge will be obtained. For the reflection of objects on mirrors, let A A, A A represent a room, A A, *g g* a vertical mirror, *g g*, *d d* another vertical mirror, and *d d*, S A an inclined mirror. If it be required to find the reflection of the lady on the glass which stands at *u*, take the distance *u y*, and set it from *y* to *m;* this will be the place of the image, which must be drawn the same height as the figure. The figure and its image will now be both reflected in the inclined mirror on the opposite side of the room, and on the mirror at the end of the room; from thence they will again be thrown back, and so on perpetually receding and diminishing, until the multiplied reflections of the room and the images of the figures are gradually and imperceptibly lost in the remote distance.

OBSERVATIONS.

A street seen reflected in a convex mirror is truly picturesque. Long buildings, where nothing material is to be seen at either end, as the entrances into parks, &c. should be drawn in parallel perspective; for if they were drawn angular they would present a very distorted and unnatural appearance. The young student will find it advantageous to hang up in his study prints of the best old masters; they will act as a constant stimulus to exertion. He should likewise habitually search for excellencies in the different paintings which he sees, and not for defects. Young practitioners, and even those who have made much proficiency in the art, are too apt to indulge themselves in severe criticisms on the errors of others, forgetting that the surest way to eminence is, to possess a mind alive to the impressions of beauty; and that it is the worst species of dishonesty to build our reputation on the ruin of another's fame.

PLATE L.

A practical Method of taking Views of the Interior of Buildings, and representing open Doors; with a Disquisition on the Anamorphosis and Distortion of Columns and Globes when drawn perspectively on plane Surfaces, comparing the usual Method with that adopted by Joseph Gandy, Esq. A. R. A.

Let R, R, R, R be corners of a room, two sides of which are required to be drawn in perspective. Assume the station S, and let T, T, T, T be a table on which is fixed a sheet of paper, as *a a*, *b b*. Draw the line S *m* parallel to the side of the room, and S *n* agreeable to the angle of view; then draw *a a* at an equal distance from S, and parallel to the edge of the table; also draw *a b*, *a b* perpendicular. This being done, hold up a rule on *a*, at the left corner of the paper, and mark on it the angle *n* as seen on the floor, and the horizon and ceiling above it; set up these measures on the line *a b*, which will be the perspective height of the room: proceed in like manner with the line *m*, and from the angle R this perspective height is shewn by *a e:* now draw *t e* and *b e*, which will give the vanishing points: they may likewise be obtained by producing the lines *a b* and *g h* perpendicular to *a g*, because S *m* and S *z* are parallel to the side and end of the room. The perspective angle of the room S *n* being practically obtained, the propriety of the method used may be thus shewn:—Set the compasses on S, and describe a curve round from *n* to the centre of the picture S R; make S E the height of the eye above the table, and draw E B parallel to the line S R; also draw G L perpendicular to S R; lastly, set the height of the room on the line G L, and draw G L to the eye E: then will *o*, *o*, *o* be the perspective floor, the horizon, and ceiling, which sufficiently explains the proposition. Open doors may be drawn by two methods:—Let *d*, *d* be the doors. Draw the line *d q* parallel to the end of the room, the visual rays *d*, *d*, *q* towards the station point W, and *d x* perpendicular to the side of the room; then set the height of the doors on P P, &c. and draw them to the vanishing point V; lastly, draw the parallel lines *i*, *i*, and the points where they intersect the descending visual line will be terminations whereby to draw the doors. This is sufficiently clear by the very construction of the diagram. If three columns viewed from a point opposite the centre one are represented on a plane parallel to their surface, the farthest will be the largest, according to the usual method; but if drawn according to the method practised by Mr. Gandy, it will be the least: *a*, *a*, *a*, *a*, *a*, *a* represent the diameters as usually taken, *p*, *p*, *p*, *p*, *p*, *p* their diameters on a curve according to Mr. Gandy's method. If three globes are observed from a similar point of view, the farthest becomes elliptical, and only the centre one retains its original figure, as shewn by the diagram on the plate: A A are two larger globes shewing how to find their major and minor diameters when viewed at Y Y; *c c*, *c c* are the greater, and *e e*, *e e* their lesser diameters.

OBSERVATIONS.

If a mirror is fixed at the end of a room, the vanishing point of the room is where the eye of the observer is seen in the glass. It is not required that the floors and ceiling should always terminate regularly at the angles to be perspectively true, as P P, H H; for we are to consider ourselves as looking at the object through a picture-frame held up before the eye, as F F, which may be of any dimension, and raised or lowered as seems most eligible or picturesque.

PLATE 50.

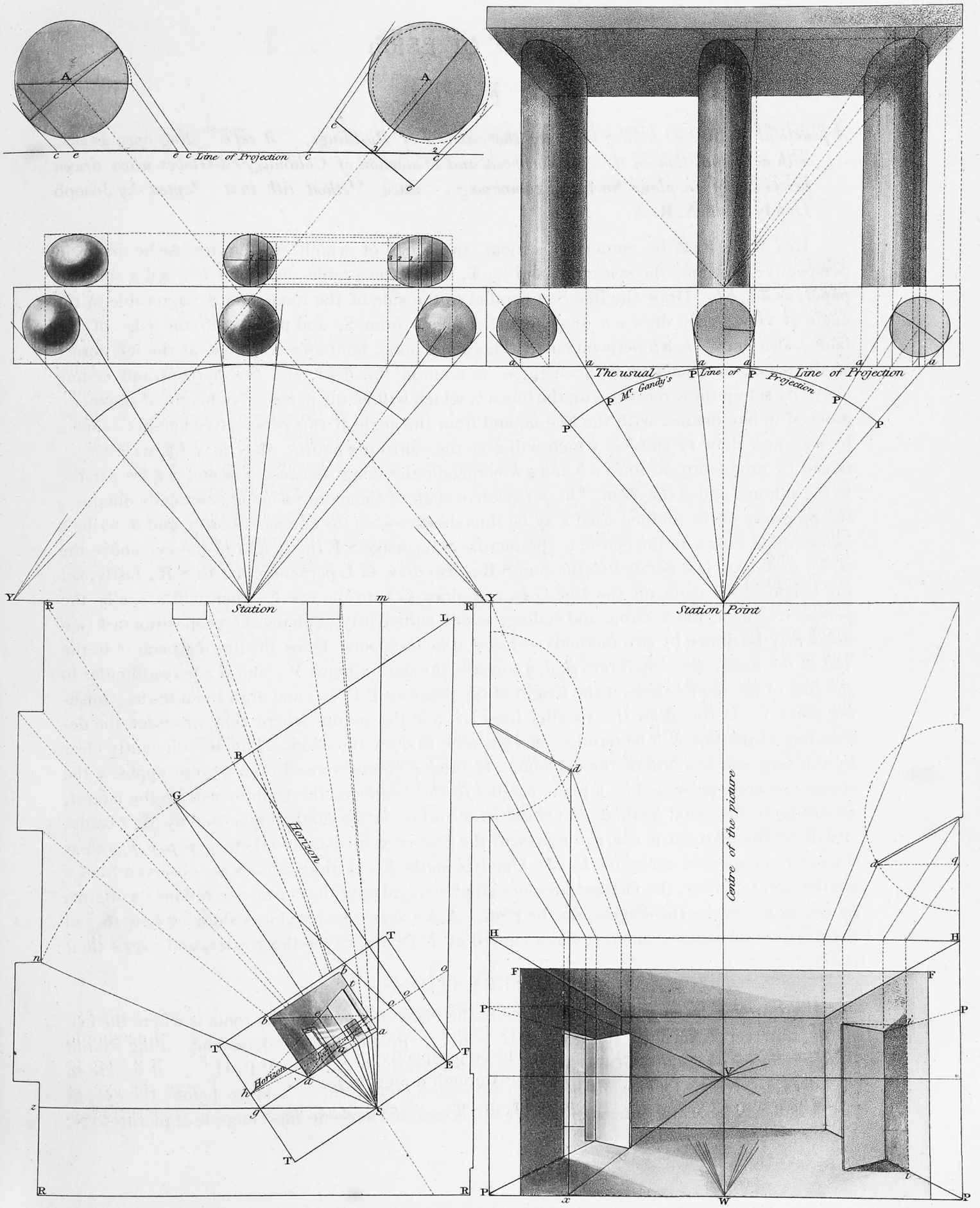
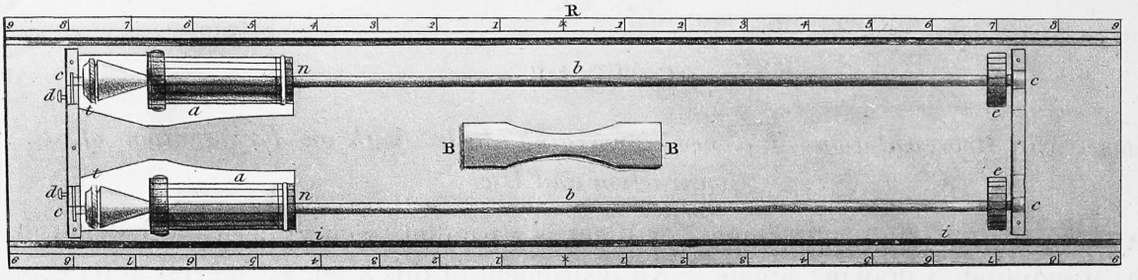
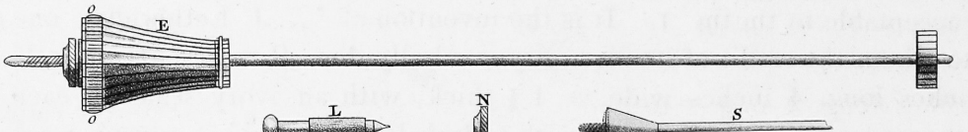
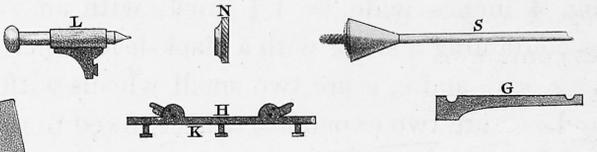
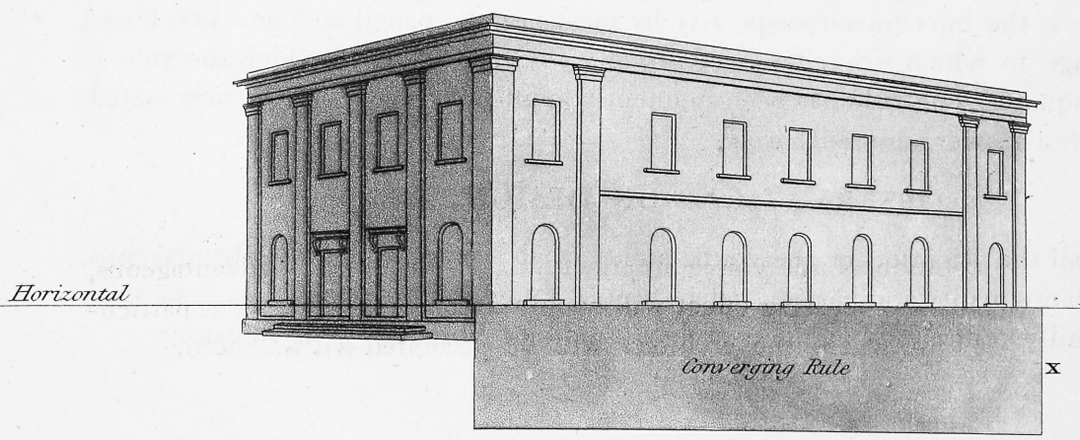

A
A
Line of Projection
The usual
Mr. Gandy's
Line of
Projection
Line of Projection
Station
Station Point
Horizon
Horizon
Centre of the picture

PLATE 51.









J. Lethbridge inv.t et del.t

London Printed for Samuel Leigh, 18 Strand. Aug.t 2nd 1815.

T. L. Busby sculp.

PLATE LI.

A geometrical Representation of a new converging Rule, with an Explanation of its Construction and Use.

THIS rule, by its various adjustments, will act as a parallel, a curvilinear, or radial rule; and even, if required, a drawing square. An instrument of this kind, so general in its application, must be acceptable to the artist. It is the invention of Mr. J. Lethbridge, one of my present pupils, to whom the credit of its ingenuity is wholly due. R represents the rule, made of ebony, 18 inches long, 4 inches wide, and ¼ thick, with an ivory scale on each edge, and two dove-tail grooves containing a slider with a black-lead pencil: *b*, *b* are two steel axles, extending to the centres *c c*, *c c*; and *e*, *e* are two small wheels with milled edges, which are fixed to the axles *b*, *b*; and *a*, *a* are two expanding wheels fixed to the axles at *n*, *n*. The ends of the axles go into the centres *c c*, &c. which centres are fixed to the rule by screws from the under side. This instrument will evidently act as a parallel rule, if moved forwards by the finger-nob B B. It may be thus transformed into a converging rule:—The cylindric wheels *a*, *a* are formed of separate pieces of brass, closing on the axle, which runs through the middle. The cone *t*, which slides on the axis *b*, being forced into the wheel *a* by the nut *t*, will expand it from its original state to a conic form. This wheel being now changed into a conic frustrum, while the other end of the same axle remains cylindric, the rule will evidently graduate round when moved forwards, and describe a small circle. It may be adjusted by raising up the cone on the brass joint *c*, which brings the edge of the wheels *i i* equally distant from the edge of the rule. The centre *c* is then fixed by the screw *d*. It will now describe a perfect radial line, more or less distant as the cone is more or less forced into the wheel. In the centre of the rule underneath are two small wheels, to prevent the four upper wheels from working at the same time. If the wheels on one axis are adjusted to the front of a building, and those on the other to the end, all the vanishing lines may be drawn by applying the rule alternately to the front and end of the house. E is a wheel fully expanded, the cone being forced into it, and *o o* is a spiral steel spring around the expanding wheel, for the purpose of bringing down the wheel in proportion as the cone is drawn back. G is part of the wheel, and S the cone and part of the axis; N is the adjusting nut, H the outer side of the joint, K the screws which fasten it to the rule, and L the slide and pencil which go into the groove for the purpose of describing curvilinear perspective. X shews the rule applied to a building, and describing the converging lines. At Y it draws the radial or occult lines; and Z shews it applied to a colonnade, describing the curvilinear perspective by means of the pencil *m*. At the left end of the rule is a hinge to which is fixed a piece of ivory, by turning down which the rule is transformed into a square. This rule has been frequently applied to every purpose here stated, and has been found to answer admirably well.

OBSERVATIONS ON DESIGN.

I shall here call the attention of the young architect to a practice highly advantageous, and by which much originality and pleasing effect will be found in his designs. It is particularly adapted for a hilly country, where the architect will be presented with numerous pic-

turesque combinations, and be enabled to depart from those common, hackneyed, and monotonous forms of buildings so usually executed. Suppose, for instance, a small piece of ground to be given on which to erect a country-house, and the house is required to be so placed as to give it magnificence, and the lawn to have the appearance of great extent. Much consideration will here be necessary; for it is evident, that a house built of a particular form and on a particular part of the lawn, may have a very mean appearance; yet, if built on another principle, and erected on another part of the ground, may convey an idea of extent and magnificence. The architect will adopt with advantage the following method:—First draw a plan of the ground, adhering strictly to the characteristic features of the country; then mark the common pathway, should there be any. Next, with deliberate observation, fix upon the site for the house where it will give the lawn the most extent. If it be placed at one corner of the ground, it may probably display the lawn to the greatest advantage: this, however, may not be eligible, on account of the surrounding views or the general aspect of the country*, which require it to be placed more towards the centre. This situation may be readily admitted if the ground undulates, and the lawn still convey the idea of considerable magnitude. The apparent extent of the lawn may be assisted by a judicious plantation of irregular low shrubs in the valley below, or in the neighbouring fields. If the fences are kept low, they will not be seen or regarded, and the lawn and the adjacent grounds will seem to be thrown together. In designing the elevation of the house, should the country around be hilly, it is proper to draw the outline of the various rising grounds, and then to adapt the different elevations of the building to the different aspects of the country, so as to make the outlines of the house and the hills behind harmonize by according lines. The outline of a country-house, being distinctly seen against the sky at a considerable distance, ought to be well studied to produce a pleasing effect. If architects were to make outlines of the grand and sublime forms of rocks and mountains, particularly as they are seen under the influence of twilight or a misty atmosphere, and to compose different portions of buildings suitable to this outline, such as towers, domes, turrets, cupolas, pediments, ornamental chimney-shafts†, &c. and then fill up the intermediate parts with doors, windows, and other component parts of architecture, an endless variety of the most picturesque architectural designs would be produced.

* Perspective drawings of designs for houses from stations where the edifice would be most conspicuously seen, would answer better than a model; for if we have simply the model we lose the surrounding scenery, and are unable to judge of the real effect: the architect may therefore save his employer that unnecessary expence. In forming designs, all objects should be perspectively, not geometrically, pictured in the mind previously to our delineating them on paper; because we always see them perspectively, and never geometrically.

† Mr. Soane appears to have paid peculiar attention to the decoration of his chimnies: those lately executed, after his design, at Chelsea College, have a truly painter-like effect. He seems to consider, with Vanbrugh, that the outline against the sky should be well studied and contrasted.

DEFINITIONS *of* TECHNICAL TERMS USED *by* PAINTERS,

INCLUDING THE DIFFERENT KINDS OF PAINTING.

Oil Painting is the art of painting with colours ground up in oils, which are afterwards combined with spirits, varnish, &c. to make them readily flow and dry on the canvas or mill-board, the usual surfaces on which oil paintings are made.

Water-Colour Painting is the art of making a picture with colours ground up with various kinds of aqueous gums or sizes, then called transparent colours. These drawings are executed on various kinds of paper, and are generally termed tinted drawings.

Distemper Painting is the art of colouring with powder or other body colours (generally termed opaque colours), mixed up with gum Arabic, whites of eggs, size, or any thin glutinous substance. Some of the common water colours, in cakes, are so compact in their particles as to be absolutely opaque, notwithstanding their mixtures with transparent gums, as king's yellow, yellow ochre, Naples yellow, Indian red, red lead, white lead, &c.

Fresco Painting is the art of painting on walls, as the altar-pieces in some churches, the ceilings of a palace, &c. The colours are laid on the plaster while wet. It was much practised in Italy by the old masters, but is very little known among us. Some have supposed it to be a composition of pure bees' wax and spirits of turpentine, incorporated with fine powder colours.

Crayon Painting is the art of drawing with crayons or chalks, generally on grey or other coloured papers, and sometimes on vellum or soft silk.

Velvet Painting is the art of colouring on velvet with transparent liquid and other ready diluted colours, compounded and made up with various acids, alkalis, &c. according to their nature and qualities. Flowers and fruits are the usual subjects of this kind of painting.

Cartoon is a distemper-coloured drawing, made on paper, linen, parchment, &c. &c. of the exact size and pattern of a design intended to be executed either in tapestry, mosaics, or on glass: such are Raphael's divine pictures from Sacred History, in the royal palace at Hampton Court.

Cabinet Pictures are small valuable paintings of the old masters, usually painted on copper or pannel, and are either hung up in libraries, studies, &c. or are kept in a cabinet made to open with small folding doors: sometimes they are attempted to be preserved by a sliding curtain fixed to the frame, but nothing is so prejudicial to the colours.

Still Life signifies a picture of dead game, or fish; but it may be a representation of any other objects, either naturally devoid of animation or motionless, as cabbages, carrots, turnips, fruit, lobsters, crabs, &c. grouped together: such are the paintings of Jan van Huysum, Baptiste, Snyders, &c.

Familiar Life is any scene near home, or within a room, as a card-party, a Christmas gambol, or kitchen, with various figures and furniture, a country fair, &c. &c.: such are the celebrated performances of Teniers and Isaac Ostade.

Composition is a certain number of objects collected together, and arranged in a picture

according to the taste and judgment of the painter. It includes the general distribution of the objects, the grouping, the attitudes, the draperies, and the management of the back-ground.

Character in a picture is giving to the different objects their appropriate and distinguishing appearance. The spectator immediately recognizes them as a faithful representation of nature.

Costume refers to manners, dress, buildings, animals, &c. peculiar to a certain country: whenever, therefore, a painting is intended to represent any particular transaction which occurred in a former age or distant climate, the natural character, manners, and costume of the time or country should be strictly preserved.

Grouping is the arranging of figures in different masses in an historical composition, which groups ought to have a correspondence and relation with each other suitable to the principal action represented. It is also the proper disposal of the clumps of trees, the different animals, and various other objects, in a landscape.

Balance, or *Equilibrium*, in a picture is when the forms of objects, the lights, shades, colours, and expression, are happily adapted to each other, and no one figure or colour overpowers or obscures the rest.

Bearing is a word frequently made use of when delineating an antique plaster figure, or a landscape: we say, the drawing of the figure has not the same bearing or angles of inclination on the paper as the original possesses, it is out in all its bearings, &c.

Studied is applied to paintings which appear to have been accurately delineated from living models and fragments of natural objects collected for this purpose, every part being highly and completely finished.

Freedom is a bold and spirited manner, with evident liberty of the pencil. The drawing is apparently done with ease, as a flourish in writing. This freedom should never be indulged until an accurate knowledge of form is acquired. It is the opposite to laboured.

Mannerist is a painter whose pictures have no resemblance to the beautiful varieties of nature, but discover an unpleasing and tasteless sameness, and appear as if they were all "cast in one mould."

Outline is the contour of objects, or the boundaries of the masses in a picture. These ought to be playful, graceful, and free; not hard and offensive, nor every where equally strong and perfect.

Chiaro-oscuro was a term used by the Italian masters to denote a drawing made in two colours only, namely, black and white*, such as engravings, &c.

Relief in a painting is when objects appear to stand off, or to be detached from the canvas; or, as Mr. Opie termed it in his lectures, when the figures appear to be walking out of the frame. In a landscape, a dark tree will beautifully relieve against a light sky, and a light tower against a dark cloud.

Keeping is the observance of a due proportion in the general light and colouring of a picture, so that no part shall be too vivid or glaring for another, but a proper harmony be evident in the whole performance.

* Leonardo da Vinci says, that neither black nor white can properly be termed colours; the one being a mixture of every possible colour, the other a total absence of colour: however, agreeably to the common usage of the words, they are here so called.

Gradation is the gradual receding of objects into the remote distance, by a proper strength or due diminution of light, shade, and colour, according to their different distances, the quantity of light which shines upon them, and the medium of air through which they are seen.

Partial Shade is a shade thrown on parts of the picture by supposed objects which are not included in the view.

Effect is the art of giving to a drawing solemnity, awe, sadness, mirth, or tranquillity, by a judicious combination of objects, and by proper light and shadow. It is a faithful representation of the appearance of nature in certain circumstances and at certain times: such as morning effect, evening effect, twilight effect, and stormy effect; torch-light and candle-light effects, &c. &c.

Transient Effect is that effect which is given to a drawing by a shadow on any part of it, as across a field, house, &c. from a supposed cloud passing before the sun, or from a tree, an edifice, or any other object not seen in the picture, but either on one side or behind the spectator, as the shadow from a tree seen in Plate XXXVI.

Key is a term derived from music, and applied to painting when one object, generally the principal one, is so vigorously worked up to its proper tone, strength of colour, &c. that the painter is compelled to finish the whole piece in a masterly manner. This is said to have been the practice of Titian.

Kept-down is a technical term implying gloominess of tint, or an object so shaded with fuscous colours that its form can scarcely be determined; or an object which is not intended to be seen until the spectator has regularly observed all the other parts of the painting.—

> "What would offend the eye in a good picture,
> The painter casts discreetly into shades."——BLAIR.

Harmony is the general accordance of the objects in a painting with one another, and their subordination to the principal object, so that all unite to constitute a pleasing whole. It is effected by a due combination of lights and shades, by a union of colour, or by such contrasts as are sufficient to relieve the distant groups.

Discord is applied to painting when there is a disagreement of the parts or the colouring; when the objects appear foreign to each other, and have an unpleasing and unnatural effect.

Tame is a word applied to slightly finished drawings, or to a painting that wants animation and spirit, or in other words, sentiment and feeling.

Depth, or *Force*, signifies in painting, strength of colouring and distinctness of parts. The different objects, and especially the shadowy parts, are strongly delineated, yet in a delicate and masterly way.

Breadth is applied to painting when the colours and shadows are broad and massive, such as the lights and shadows of the drapery, and when the eye is not checked and distracted by numerous little cavities, but glides easily over the whole. Breadth of colouring is a prominent character in the paintings of great masters.

Contrast is the skilful variety of colours, attitudes, and figures, introduced in a painting. Sometimes the contrast may be so great as to create discord and produce an unpleasant effect; but a judicious opposition of colour or attitude, by relieving the different groups, will harmonize and give spirit to the composition.

Softening is the art of washing off the edges of shadows while wet, to make their terminations appear doubtful and uncertain, as on columns or other round objects, which thus acquire their convex appearance.

Blending and *Melting* are synonymous terms. It is the method of laying different tints on trees, buildings, &c. so that they may mingle together while wet, and render it impossible to discover where one colour begins and another ends. A variety of tints of nearly the same tone, employed on the same object and on the same part, gives a richness and mellowness to the effect; while the outline, insensibly melting into the back-ground and artfully disappearing, binds the objects together and preserves them in union.

Stippling is the method of rounding off the convex parts of a portrait in miniature-painting. It is effected by repeatedly dotting lightly the parts with a brush that has but little colour in it, and constantly filling up the white specks which then present themselves to the eye. It is usually done after the first shadow is laid on and softened. This is sometimes practised in architectural drawings, when the shadows are nearly finished, to give them evenness and depth.

Hatching is shadowing with a black-lead pencil or pen, either in straight lines or zig-zag strokes; such as in the pencil-drawings of cottages, or the pencil back-ground behind a small portrait done on paper.

Scumbling is giving a kind of rough shadow to trees, grass, gravel-walks, &c. in a drawing when it is nearly finished. It is performed with a brush having some dark colour in it, and nearly dry. The hairs of the brush are spread apart, then held in a slanting direction, and swept lightly over the drawing where the shadows are wanting. This is practised by some artists, but not by others.

Glazing is finishing a drawing with some thin transparent and glossy tints, through which the first colours appear, and are heightened in their effect.

Dead Colouring is the first layer of colours, consisting usually of some shade of grey. Its design is to receive and preserve the finishing colours; and it is called dead, because it is not seen when the work is completed. Some artists always work up their drawings with a grey colour, and others very seldom.

Fore-Ground.—To define this, suppose a country mansion to be the subject of the picture; then the space of ground between the house and the lower edge of the drawing is called the fore-ground.

Middle-Ground, or *Middle Tint*, is the tint, not really in the middle of a picture, but generally, though not always, perspectively so: sometimes it is the lightest part of the picture, and sometimes the second degree of shade. All pictures should be apparently divided into three masses at least, fore-ground, middle-ground, and back-ground; but in extensive compositions, such as those painted by Claude Lorraine, there should often be more than three. The same rule applies also to the interior of buildings.

Back-Ground is the space of ground behind the house, just mentioned, or on the farther side of it.

Warmth signifies an apparent glow of sunshine given to a drawing by means of broad mellow lights, and intense brown shades, thin orange tints, warm greens, &c.

Half-Tint, or *Demy-Tint*, is seen when the sun shines on a house, or any other object, at an angle of nearly 45 degrees on the ground plane, or when it shines more on the front than on the end, or *vice-versa*. The building then assumes a faint shade of a very peculiar nature.

Air-Tint is that tint which frequently distinguishes the distant parts of a landscape, or gives a misty appearance to the whole. It is generally compounded of a blue or purple grey.

Sketch is a slight picture in which the general effect is attended to, but not the detail, and from which more finished works are usually painted.

Accessories, or *Accompaniments*, are secondary objects to the principal one; they are introduced in a picture as explanatory and illustrative of the scene: sometimes they are considered as solely contributing to the general effect and harmony of the piece.

Figures in a painting means representations of the human figure: when there is cattle, we say cattle and figures.

Limning is an obsolete term formerly applied to portrait-painting. It is drawing or painting the body and limbs of the human figure.

Calquing is a term applied to the process of copying or transferring a drawing. It is effected by rubbing over the back of the original with a fine powder of black lead or red chalk; the smeared side is then laid on a sheet of paper, and a blunt-pointed needle is traced over the lines of the drawing, this imprints them on the paper underneath. The best method, however, to take a copy of a drawing is, to hold it up to a window with a sheet of paper before it; the outlines will then appear through the paper, and may be penciled off without the least damage to the original.

Reticulation is the method of copying a painting or drawing by the help of square threads. An open frame is made similar to a straining frame, and the painting inclosed within it; then a number of threads are strained over it at equal distances like net-work, which are fastened to the frame by nails. The canvas or paper is divided into an equal number of squares, and whatever appears within the square threads in the painting, is copied into the corresponding squares on the canvas or paper. The squares of the copy may bear any proportion to those of the original. Painters often adopt this method when they first execute a small design from which their large and finished work is copied*.

Layman is a figure made of wood or cork, in imitation of the human body. It can be placed in any position or attitude, and moves at every joint, on the principle of the ball and socket. It serves, when clothed, as a model for the drapery and for fore-shortening. A man would often be overcome with fatigue while the painter was copying the attitude, and would frequently involuntarily change his position.

* This may be done with more facility and with the greatest accuracy by a Graphic telescope invented by Mr. C. Varley, for which he has taken out a patent. By this instrument, any person who can make a good outline may draw correctly all kinds of objects, the most distant as well as the nearest, and magnified to any required scale, from five to sixty times, according to the power of the telescope. The positions and fortifications of an enemy may be thus drawn, and objects inaccessible on account of intervening water. By this telescope portraits may be delineated of all dimensions, from those which are much larger than life to the smallest miniature, perfectly free from distortion, with more or less perspective as the artist may require. Pictures, prints, busts, statues, &c. may be drawn, enlarged, or reduced, either the right way or the reverse, for the convenience of engravers, who may thus copy a picture or print line for line.

THE THEORY OF LIGHT AND SHADOW.

THE philosophical world is yet divided as to the nature of light, whether it consists of particles of matter emitted from luminous bodies, or whether the universe contains a highly rare, elastic substance, which, when put into a state of undulation, produces those effects on our organs of sight which constitute the sensation of vision. In treating on the Theory of Light and Shadow, I shall adopt the former of these hypotheses, as most satisfactorily accounting for all the phenomena of reflection and refraction.

Light is that which, proceeding from any body to the eye, produces the perception of seeing. A stream of matter is perpetually issuing from every luminous body; this falling on objects, and being again partly reflected from them, renders them visible to our sight. The matter which issues or is sent forth from the luminary, is called light, and the luminous bodies producing this light are, the sun, the moon, a fire, a torch, a candle, &c. A beam emitted from the luminous body is sometimes called a ray of light; and the rays, after being emitted, always proceed in straight lines. The rays from the sun which fall on any object are supposed to be parallel: strictly speaking, they are not so; but so immense is the distance of the sun from us, compared with any distance which we can measure, that the divergency of the rays from a parallel direction is absolutely imperceptible. An object through which light can penetrate, as glass, is called a transparent object; and an object through which light cannot pass, as iron, &c. is called an opaque object. There are likewise infinite gradations between the greatest possible transparency and perfect opacity.

Shadows are dark and defined gloomy parts seen on objects, occasioned by some projections obstructing the rays of the sun, torch, or candle. They may likewise be produced by the intervention of neighbouring objects. The rays which emanate from a luminous body always proceeding in straight lines, the form and dimensions of the shadows are reduceable to mathematical rules. This science is called sciography.

Shade is a dark and undefined penumbra shadow, such as we usually see under the eaves of projecting roofs, cornices, balconies, window-sills, reveals, &c. in the shady side of a house, and is occasioned by the deprivation of the light reflected from the sky, &c. It is also that gloominess observed in groves of trees, or in a room, under the tables and chairs, when the daylight streams in at the window or other apertures.

Reflection.—Light is transmitted by some bodies, by others it is partially or totally absorbed, and by others it is thrown back again or reflected. The principal reflecting substances are polished metals and mirrors. The first law of reflected light, and which constitutes the very foundation of all our reasoning on this branch of optics and perspective, is the following:—The angle of reflection is always equal to the angle of incidence. If a person stand a little on one side of a looking-glass, he sees not himself nor the furniture on his side of the room, but that on the opposite. If he go to the other side of the glass, he loses the furniture which he had before seen, and perceives that only which is on the opposite side of the glass. Should a ray of light fall perpendicularly on a reflecting horizontal surface, it could form no angle with it, therefore it must be thrown back again in the same direction. We may illustrate this

in the following manner:—Let an elastic ball fall vertically on a horizontal floor, and it will then rebound in the same direction; or if two persons of equal height were to stand on a level floor, at equal distances from a given point, and one were to throw an elastic ball on that point, in the direction of a line from his eye to that point, the ball would rebound and strike the eye of the opposite person.

If the rays of light fall on any concave or convex surface, the angle of reflection will still be equal to the angle of incidence: therefore, reflecting bodies whose surfaces are uneven will reflect the sun's rays in all directions, or in as many as there are inclined planes. Hence the different degrees of light reflected on objects from various surfaces in different positions, particularly in the interior of a building, make it extremely difficult to lay down any certain practical rules. This, in short, is not so properly the subject of mathematical reasoning, as of experiment and observation; much depending on the situation and inclination of the reflecting surfaces, the materials of which they are composed, their colour, transparency, opacity, smoothness, or roughness; and also on the vividness, magnitude, and direction of the primary light which falls on them.

That light is reflected in various directions will be evident, when we consider that a perfect plane cannot possibly be produced. If a surface be polished to the greatest exactness, the microscope will shew that it is still irregular and uneven, and composed of various inclined planes, which must necessarily disperse the rays of light in every direction. The reflecting power of substances is in proportion to the evenness of their surfaces and the lightness of their colour. The darker and more irregular objects are, the less power will they have to reflect the light, the principal part of it being absorbed and lost: but white substances will reflect the greater part of the light which falls upon them. The only sure method therefore of succeeding in giving a proper effect to the shadowing of the interior of buildings is, a diligent study of nature.

It has been observed in another place, that we cannot determine the distance of an object by its apparent magnitude alone, but partly by the air tint which surrounds it, its strength of colour, and distinctness of parts: therefore, to give an object its true proportion and magnitude according to the rules of perspective is not sufficient, unless at the same time it be expressed with that proper faintness and gradation of colours which the distance would require, and which is properly termed aërial perspective.

Some colours naturally reflect more light than others: consequently, an object will be more illuminated when exposed to one colour than to another, although at equal distances. To prove this, take a sheet of white paper and hold it a little below a window, and parallel to the wall; a very bright reflex light will be seen on the wall: hold the same paper inclined, and the reflection will be less*; then substitute a piece of dark-coloured paper, and scarcely any reflection will be perceived.

All colours appear differently in the shade to what they do in the light, or when the sun shines on them: but although every colour assumes a different hue in the shade, yet the original colour is always distinguishable, unless at a great distance. All reflected rays are tinged with the colour of the objects from which they are thrown back, and if after reflection they

* The greatest reflection will always be when the angle of reflection is equal to the angle of incidence.

fall on any other object, the colour of that object will be compounded of the reflected rays and its own native colour. If light reflected from a yellow object fall on another which is blue, it will give it a greenish tint; red on blue will be purple, &c. &c. So in a historical subject, the drapery of the figures will all be changed from their original colours by reflections from each other.

The reflected light of all objects seen at a distance will not be so vivid as that from near objects; because light always proceeding in straight lines, its intensity must necessarily diminish in proportion to the square of the distance. The colours of distant objects will also become tinged with a faint azure, or with the haziness of the body of air through which the rays must pass. All objects in shade will become gradually fainter, both in colour and substance, as they recede from the eye, until the shadows and colours will not be distinguished from each other, being equally enveloped in the mistiness of the atmosphere.

Light will be much more variously reflected in a room than on the external part of the building: for every aperture in every direction gives an inlet to a different stream of light, probably of very different intensity; by which means the various parts of the room will assume very different degrees of light and shade, and will likewise be affected by the colour of the various objects from which the light is reflected. A house in town will have more reflex lights on it than one in the country, it being more closely surrounded by other objects from which the rays will be reflected according to the inclination of the reflecting surfaces; such as horizontal pavements, vertical walls, and inclined roofs. If houses are situated in a close street, their bases will be nearly deprived of the light from the sky and the reflection from the ground: they will therefore be necessarily darker at the bottom than those which have no other houses in their vicinity. Where a building is detached, as a church or tower, it will be the reverse: the summit having little reflected light, will be the darkest, or rather, the faintest, the colours being tinged with the grey hue of the surrounding atmosphere; while the base, receiving a strong reflection from the sunny grass or gravel below, will be the brightest part of the building. An artist, therefore, who would succeed in aërial perspective, must carefully observe the effect which different distances and reflected colours will have on each original colour. He must know how its hue or strength will be heightened or diminished, that he may be able to give to each original object its mingled or acquired colour, and its proper tone and gradation, according to its determined place.

As all objects in a picture take their proportion from the magnitude of those which are placed in the fore-ground, so, in aërial perspective, the strength of shadows and the brightness of colours belonging to the objects which are close to the line of projection, must serve as a measure to graduate the lights and shadows of the other objects, according as they are more or less remote. It is not absolutely required that the measures of the objects on the ground-line of the picture should be equal to life; they may be larger or smaller, provided every other figure bears a true proportion to that which is first chosen as a standard*. In the brightness of the colours, any degree of intensity may be adopted for the greatest light in a picture, if the lesser degrees of light have a corresponding gradation. Any tint will represent light when contrasted with a darker, or it will serve as a shade when opposed to a lighter colour. It is of little consequence,

* Mr. Haydon, in his celebrated painting of the Judgment of Solomon, has taken the standard of his figures at seven feet, yet there is no appearance of disproportion. This I find is a scale he generally adopts in his large historical subjects.

therefore, in point of keeping, how light or how dark a picture is, if its transparency is preserved, and the several parts have their proportional degrees of light and shadow: but if any colour should be made too bright for the general hue and character of the picture, it will appear unpleasantly glaring, and give a deadness to the other parts of the drawing; or, as the painters express it, the brightness of that colour will overpower or kill the rest.

An object seen in a plane mirror always appears as far behind the reflecting surface as it really is before it. This will be evident, if a person standing in front of a mirror will observe his own image and that of the surrounding objects as reflected from the glass. Every thing retains its true relative position. If he advance towards the glass, his image advances to meet him; if he stretch out his hand till it touches the glass, the image likewise does the same in a very curious and amusing way; if he recede, the image proportionably recedes.

The reflection of an object in water is always seen as far below the surface of the water as the object itself is above it, making the same angle of inclination below the water as the object itself makes above it. Therefore, to find the depth at which an object should be represented as reflected in water, a line must first be supposed to be drawn on the surface of the water, and reaching underneath the bank on which the object stands; then if a perpendicular line be brought down from any part of the object to the horizontal line of the water, and the height of the object be taken at that point, another line of equal length at the edge of the water falling perpendicularly to the horizontal line will give the depth required. If the water be rimpled by the wind, all reflection will then be rendered invisible or broken.

PRACTICAL REMARKS ON SHADOWS.

When the sun shines on the front of an edifice and not on the end, or on the end and not on the front, the shadows of the various component parts of the building on the sunny side will be very different from those on the shady side of the house; the one being illuminated by the sun, the other receiving its light partly from the sky and partly from the reflection of the ground or neighbouring objects. The former will always be definite shadows (except on columns and convex mouldings), and the latter indefinite shades. The rules for adjusting various degrees of sun-shadow and the day-light shades on the different mouldings of cornices, columns, and other projections on the exterior of a building, which are here given, are the result of much study and observation: the causes and effects being similar, they may be considered as extending to every other object.

OBSERVATIONS ON THE FRONT OF A HOUSE IN SHADOW.

If the house has a coping or top stone on the wall projecting over it, the stone will have a shade underneath, and a defined shadow thrown from it on the wall below. The shade under the visible part of the stone will be the lightest, having a vivid reflection thrown upwards from the sunny wall below, and the projected shadow will always be the darkest. The shade and shadow under the soffit of a projecting roof will have the like degress of intensity.

The crown moulding, or top moulding of a horizontal cornice, which is concave, will be darkest at the bottom of the cove and softened upwards, on account of its receiving a bright reflection from the sunny wall below. If the whole cove is not immersed in shadow, the lower part of the shadow will shew a defined edge. If the crown moulding is concave above and convex below, it will exhibit two principal shadows, one on the concave part, the other on the convex. The upper shadow (which should in general include about one third of the moulding)* will shew a definite line at its bottom edge along the cove, occasioned by the fillet above it; and the upper part of the shadow will gradually diminish towards the edge of the upper fillet. The lower shadow will be darkest a little below the most prominent part of the moulding, gradually diminishing into the cove above and towards the fillet below. The fillet under the moulding will shew an even defined surface of shade, terminating at the moulding. If the whole fillet is not obscured from the sun, the illuminated part will reflect a gleam of light along the lower confines of the moulding, which is here supposed to be the case. If the crown moulding is convex above and concave below, there will be three definable shadows on it. The first will be a positive line of shadow along the upper part of the moulding, thrown on it from the fillet above. The next will be a mass of shade along the convex contour of the moulding, about one third of the distance from the fillet, softened a little upwards, and gradually blending with the recess of the cove below. The third will be a defined line of shade, about one fifth of the distance upwards from the bottom edge of the

* The sun's rays are here supposed to make an angle of 45 degrees with a vertical plane.

moulding, and the upper part of it graduating into the deepest part of the cove, where it will blend with the middle shade. There will consequently be a reflex light at the junction of the two lower shades. This proceeds from the lower part of the cove, on which the sun is supposed to be shining; the shadow in the lower part shews a defined edge. If the bed-moulding under the planceer is comprised of a quirk ovolo above and a cove below, with a fillet in the middle between them, the ovolo will have the first degree of shade in the quirk, gradually becoming lighter on the moulding; the vertical surface of the fillet will have the second degree, and the third will be on the lower part of the cove, gradually softening towards the fillet in the middle. The top of the cove and the bottom of the ovolo will therefore be the lightest parts of the mouldings, occasioned by the reflex lights from the illuminated wall below. The soffit, or under surface of the planceer, will always have a less degree of shade on it than the bed-mouldings; the former being compounded of curves, and the latter of a plane, and also more inclined towards the reflex lights. The plane of reflex light under the soffit will always appear along the end of the soffit through the shady side. If there are mutules or dentils in the cornice, they will have two degrees of shade on them; namely, the lighter below, and the darker on their sides. If the mutules are far apart and a shadow is projected on the wall, that shadow will be darker than the shadows of the mutules.

The reveal to a blank window will have two degrees of shadow, the lighter round the reveal, and the darker thrown from it on the wall. A stone window-sill will have two degrees of shadow, the lighter under the sill, and the darker shadow projected from it on the wall.

A balcony projecting on cantilivers will have two degrees of shade, namely, the lighter under the cantilivers, and the darker on their sides: but the shadow which is projected from the balcony on the wall will be darker than either. If a stone step is attached to a wall it will produce two shades, namely, the lighter on the riser or edge of the step, and the darker on the ground. This will likewise be the case in a flight of steps.

A column attached to a wall will shew a defined shadow on the wall, and which will be intensely deep in the cavity. A reflex light will be seen on the column a little from the wall, and a line of penumbra shade uniting with it, softened towards the wall, and also towards a bright light on the farther edge of the column. If the column is detached from the wall, and the light proceeds from the right, the principal mass of shade will be on the column near the left hand, graduating off to the right hand, where it falls in with the principal light, which is near the right-hand edge. There will, consequently, be a faint shade on the edge of the column at the right hand softened into this light, also a faint light at the left-hand edge. If a circular bow project from the wall, it will have the same degrees of shade as the column attached to the wall, with the exception of the shade between the column and the wall.

A circular-headed niche in a vertical wall, which has a shadow projected into it, will be definite at the edge in the niche, and softened towards the front and head. If a dwarf wall or any other object throws a shadow on a flight of steps, the top of the steps will at all times be the lightest.

OBSERVATIONS ON THE SIDE OF A HOUSE IN SHADE.

If the house has a coping or top stone on the wall projecting over it, the stone will have a shadow underneath, and a little penumbra shade softened from it down the wall. The sha-

dow under the visible part of the stone will be the darkest, being the most obscured from the sky ; and the penumbra shade will be the lightest. The vertical surface of the stone and the wall will be the third degree of shade, and equal to each other, if the materials be of the same colours ; but if the wall be dark brick, and the coping white stone, the coping will be the lightest. The shades under the eaves of thatch, and the soffit of a projecting roof, will have similiar degrees of shade.

The crown moulding of a horizontal cornice which is concave, will be darkest at the top of the cove and softened downwards ; and the fillet or vertical surface above it will be the lightest. If the crown moulding be concave above and convex below, having a fillet above it and shewing an undulating line at its profile, the concave part will still have its shadow like the former ; but the convex part will have its darkest place at the bottom edge, and the shadow will be softened upwards to the cove. If there is a fillet below the moulding, it will not be so light as the top fillet, having a little dingy shade on it from the moulding above it. If the crown moulding be convex above and concave below, and have a square fillet over it, the moulding will have a shade in the quirk, a little softened towards the moulding, and a darker shade in the upper part of the concave surface softened downwards and slightly upwards.

The soffit of a planceer will always be darker than its vertical front, being most deprived of light, and having little reflection from the dark wall below. The bed-mouldings will always be the darkest in the cornice, being most obscured from the light, and having the smallest divisions and most quirks, which will condense the shades. If there are mutules or dentils in the cornice, they will have three different degrees of shade on them, viz. the lightest in front, the next degree under them, and the darkest on the side, with penumbra shades in the apertures. Dentils placed close to each other will have the interstices between them intensely dark.

The top reveal of a blank window will have a shadow underneath it, and a broad penumbra shade softened down the wall. The shade to the soffit of the reveal will be darkest. The vertical reveal of the blank window will also have a shadow, and a small penumbra shade softened from it on the wall. The surface of this reveal will always be darker then the surface of the building, but lighter than the horizontal surface of the top reveal. If the reveal of the window be circular on the top, it will still be darkest above, and softened into the perpendicular reveal, which will be the lighter of the two. Stone window-sills will have the same degrees of shade as the coping stones on the top of the house, but the visible ends will be a degree lighter than the parts which are underneath.

A balcony projecting on cantilivers will have three degrees of light and shade. The ends of the cantilivers will be the lightest, having their light immediately from the sky. The bottom of the cantilivers will have the second degree of shade, which is reflected from the ground and the wall. Their sides will be much darker, receiving only the scattered reflex lights in the atmosphere. The soffit or under surface of the balcony will be a shade darker than the bottom edge of the cantilivers, being inclosed and obscured between them, but not so dark as the side of the cantilivers. The whole of the balcony will have a mass of shade under it, softened down the wall. The under surfaces of cantilivers to balconies near the ground will generally be lighter than the under surfaces of mutules in cornices high up. The cantilivers receive two reflex lights ; the mutules receive only one.

Stone steps, the ends of which are visible, will have three degrees of shade on them. The lightest will be on the top, being illuminated by the sky; the second will be on the front or riser, and the third on the end: but if the end of the step is near the side of the house, or a portion of ground strongly illuminated by the sun, it will be lighter then the front or riser: this, however, seldom happens.

A vertical column attached to a wall will shew an intense penumbra shade in the cavity between the column and the wall; there will also be a shade on the column near it, but not so dark as this shade, and which will gradually soften towards the other visible edge of the column where it will be lightest.

If the column is detached from the wall, as a portico, it will have a gleam of light on that edge which is seen nearest the wall, and at a little distance will be a line of penumbra shade down the column, graduating into this light, and proceeding towards the other edge of the column, where it will be lightest. If the columns are fluted, the farthest visible sides of the flutes will be darkest, and the shadow will graduate into the concave part of the flutes.

A circular niche in the shady side of a house will always have its darkest part at the top, the next degree will be at the side farthest from the eye, and both softened into the recess. A circular bow in the shady side of a house will have its darkest part close to the wall nearest the eye, and softened outwards to its extremity, where it will be lightest. The whole of the bow will throw a faint penumbra shade on the plain wall, but not so dark as that part of the bow near the wall. If there is a polygonal bow on the shady side of a house, consisting of three equal sides, and projecting with reveals, and if two of these sides and one of the reveals are seen, with part of the end of the house on each side of the bow, the first degree of shade will be on the visible reveal; the second on the adjoining polygonal surface; the third on the wall on this side the reveal; the fourth on the other surface of the bow which is parallel to the wall; and the fifth on the wall at the farthest side of the bow. If three sides of the bow are seen, the farthest side from the eye will be the lightest of the three, being more directly exposed to the reflected lights from the clouds, &c. If a house has a square projection in the middle of the shady side, the projection will be the lightest, and a gleam of light will be observed at the farther edge of the projection, which will also relieve it from the other surface. The student must be careful not to make the gleam of light glaring, nor the projecting surface too light for the side of the house, as the difference is very little; neither should the transition of shade between the nearer and farther sides of the bow be too sudden, or so great as to be unnatural. This is sometimes practised by artists to so great a degree as to border on caricature, and render their performances truly ridiculous. Instead of giving magnitude to their buildings by this style of drawing, they considerably diminish every object, by giving the whole a sort of convex and unnatural appearance.

MISCELLANEOUS OBSERVATIONS ON SHADOWS.

If a square building has another building rising from its centre, and towering above it, and if the shady side of the central building and of the house fall into one apparent plane of shade, the upper edge of the lower building will shew a line of light at the top, which will

likewise relieve it from the middle building: the inner one will here be lightest in shade, and the nearer building will be strongest.

The principal light on circular and polygonal objects, such as columns and octangular towers, is on that side which is most directly exposed to the sun; and the most intense shade is where a line drawn from the column making a right angle with the sun's rays would intersect or cut the side of the column; or, if a line were drawn as a tangent to the column parallel to the rays of the sun, it would also give the principal surface of the shade.

All shadows which are thrown from one object on another will be darker than the object itself, a black object alone excepted: for this reason, those parts of objects not illumined receive the reflection of the brightness around them, while the shadow given can receive no reflection but from the object in shade.

If a near object throw a shadow on a column, that shadow will always be a definite one, if the object is not so far distant as to render the edge a penumbra.

The shadows of all objects projected on the ground, will continually become less definite at their extremities as the objects increase in height, and more definite as the objects decrease. If a lofty house projects a shadow on the ground, the shadow will be definite near the angle of the building, but towards the extremity it will be a penumbra and indistinct. To prove this, let a person stand on the extremity of the shadow, and immediately a positive edge of shadow will be seen projecting from the person on the ground, the contrast between which and the undefined edges of the shadow of the building will sufficiently illustrate my position.

The shadows from all objects projected on the ground should be bent if the ground undulates. The omission of this is a frequent error among architects; they project their shadows on the ground as if it were a carpeted floor.

If a gateway to a park entrance has an arch over it, and the sun is shining on the building, the lightest part will be in the arch above; if the sun is not shining, it will be the darkest. The shades will also be tinged with the colour of the ground underneath: if the gateway be surrounded with gravel, it will have a yellowish hue; if with grass, the shade will be tinged with green.

The top windows of a house in a street will generally be lighter then those at the bottom, having the greatest reflex light from the sky, and the least opposition of darkness from the room within; also the distant ones will be lighter than those which are nearer, for the same reason, and on account of the aërial perspective.

If the light which impinges on a hemispherical dome proceeds from the right, a crescent of shade will be seen extending from the top of the dome, and gradually increasing inwards from the left-hand side; the right-hand side will also shew a little shade. A segment dome will have the same original shade on it as part of a semi-dome cut off: consequently the position of the shade on either dome will remain the same.

Vertical mouldings will have the same kinds of shade as horizontal ones, but somewhat fainter, being more exposed to the sky. All mouldings in a drawing, if shaded according to nature, will shew of what curves they are composed, should their profile be hid.

All parallel perpendicular surfaces will have the like degrees of shade if equally distant from the eye; if the distances are unequal, they will become fainter as they recede. All horizontal surfaces will be the same, if they are not so near the ground as to receive a reflection from it, or so high up as to be enveloped in the haze of the atmosphere.

Cornices in the interior of a building, which are above the windows, will have a penumbra shade over them, if there are no apertures above to admit the light.

If an object on a floor within a room be exposed to two lights at unequal distances, there will be two shadows cast from the object on that floor of different degrees of intensity. The shadow occasioned by the nearest light will be the darkest, while the other will be the lightest.

All shades within a room will be penumbra; but if the sun shines in at a window, there will be a defined edge to the shadow where it is terminated by the interposition of the light image of the window on the floor, or on the opposite wall.

If a building has the sun shining on its front, with the end in shade, and throwing a shadow on the ground at an angle of nearly 45 degrees, the lightest part of the shady side will be near the bottom of the angle towards the front, and the darkest at the distant angle; for the former receives a strong reflection from the sunny ground, and the latter only from the sky.

DIFFERENT KINDS OF DRAWING-PAPER.

It may be useful to the student, to be made acquainted with the names and dimensions of the different kinds of drawing-paper. They are as follow :—

	Inches.		*Inches.*
Demy	20	by	15½
Medium . . .	22	—	17
Royal	23¾	—	19½
Super-royal . .	27¼	—	19⅜
Elephant . . .	28	—	23¼
Imperial . . .	30	—	21½
Atlas	33¾	—	26¼
Columbier . . .	34⅜	—	22⅞
Double Elephant .	40½	—	26⅞
Antiquarian . .	53	—	31
Extra-antiquarian	56	—	38

These are the papers generally used for architectural and other drawings, but there are rough papers called improved cartridge, of the same sizes, which are unquestionably the best for landscapes, as they will produce a much greater effect.

The papers generally used are the imperial, columbier, and double elephant, which are cut to the dimensions that may be required. The demy is too thin for drawing, and the antiquarian too expensive, being more than double the price of any of the others ; it is therefore seldom bought, except the drawing be on a very large scale. When some architects have an extensive design to execute, they join together two sheets of antiquarian paper with Vancouver's cement, or common paste, and rub down the edge of the seam with pumice-stone ; but the junction of the two sheets can never be perfectly concealed, and forms a sad blemish in the picture.

The same extent of building may be expressed with equal ease and effect on a single sheet, and on a smaller scale. This will be immediately evident to the artist. The tyro will be convinced of it by the following illustrations :—Suppose that it be required to draw the plan of a Grecian temple of an oblong form, and let it be six times as deep as it is wide. Observe it from some position a little on one side, where the depth of the building and the width of the front shall appear equal on the plane of projection. They will consequently occupy an equal space in the drawing ; and if the temple be represented without the columns or windows, it will appear in the form of a square, and possess but little resemblance to the original. Now add the columns ; place six in the front, and six times six, or thirty-six, on the side. Although but a small portion of each of the columns can be seen on the flank, yet their very number, bearing to the front a proportion of six to one, will convey to the mind an idea of six times as much depth as width in the building. A street, a college, or a palace, being much fore-shortened in a drawing, and merely the reveals of the windows being visible, will appear as long as if the whole frames of the same number of windows had been delineated.

METHOD OF FIXING THE PAPER TO THE DRAWING-BOARD.

If the paper be held against the light, the maker's name will be seen; the side on which the letters appear the right way is the best to draw on. Fold down about half an inch of the paper all round, keeping this side uppermost; then turn it and damp it well with a wet sponge; place the damp side on the board, and with a brush rub some dissolved glue* along the folded edge, which turn on the frame of the board, and smooth it down with the handle of a knife. If the paper now appear raised in the middle, or too loose, it may be tightened by forcing the edge of it while wet towards the edge of the board with the fingers. Now damp the paper on the top side, and make it principally wet in the middle; it will dry tight and smooth, and when sufficiently dry will be ready for the drawing.

PRACTICE OF SHADOWING.

The student is now supposed to be capable of drawing a good outline, and defining the boundaries of the shadows; I will therefore only hint, that he should not commence his drawing too hastily, but should form a clear and accurate conception of the whole of his subject before he attempts to delineate the minutest part of it. He will otherwise be liable to a thousand errors; he will often be obliged to abandon a performance on which he had bestowed considerable time and pains, and will always fail of conveying a perfect idea of the object to be represented.

The outlines or boundaries of objects should at first be delineated very faintly. Nature presents no resemblance to a line in any of her angles. Some architects draw the outlines of their buildings in pencil only, previous to the colouring; but it is best to delineate them faintly in ink: for if the pencil-lines are not accurately joined at their angles, they will be visible through a light colouring, nor can they well be erased after the colours are laid on. This observation does not extend to trees, clouds, &c.; those parts are never formed but by the pencil alone. Skies should always be penciled lightly.

Others delineate their outlines with some brown colour instead of ink, but this in a great measure is liable to the same objection. The best way is, to pen the outlines of all mechanical subjects faintly with Indian ink, after they have been previously traced with the pencil. Should the outlines appear too black, the whole may be washed with a wet sponge. When the paper is dry it will be ready for the shadowing; but the outlines or boundaries of the sun-shadows must be first penciled.

If the drawing is to be finely shadowed in Indian ink, take a small quantity of water in a

* Some use paste, but this requires at least an inch of the paper to be folded, and must also have a hot iron applied to it all round, otherwise the paper would dry before the paste, which would draw away the edges from the board, and make the centre elevated and uneven.

saucer, dip the end of the ink in the water and rub it on the top of your finger, then wash your finger in the water; dip the ink again and rub it, and so on until the colour be sufficiently dark. A liquid will thus be produced free from the smallest perceptible particles*.

When the tint is about one third of the proper darkness of the shadows, take a sable-hair pencil† and tint over the whole of the shadows and shady side of the building. When this is nearly dry, shade up the mouldings in the following manner:—Take two brushes, one with clear water and the other with tint. Suppose that you have a concave moulding to finish‡ on the shady side of the object, apply the tint on the upper part, and with the brush of water wash the lower edge of the shadow down into the cove; and so proceed with the other mouldings, giving to each its due proportion of light and shade. Then lay another tint over all the shadows of the object: should not this be deep enough, lay on a third or a fourth. The overshadowed mouldings will now probably appear too light. Let the two brushes again be applied to them as before directed; for which a deeper tint may now be used, if thought proper, but the same is most generally repeated. Different tints may now be laid on in proportion to the distance or receding of the different parts of the object; after which another tint over the whole of the shadow and shades will complete the drawing.

The following colours may be mixed with Indian ink for shadowing coloured drawings; namely, Venetian red, burnt umber, lake, burnt terra di sienna, &c. The following may be substituted with advantage for Indian ink; namely, burnt umber and indigo, Venetian red and indigo, light red and indigo, light red and lamp-black, burnt sienna and lamp-black, lake and lamp-black, Vandyke brown and lamp-black, madder brown and lamp-black, indigo, lake, and gamboge, also sepia. The Welch, or even the common coal, if rubbed up with gum-water on a marble slab, makes a beautiful intense brown, and may be used for the fore-ground of a landscape, or for shadowing any object; it is also a quick working colour. Lamp-black, if used by itself, is an opaque colour; but when mixed with others it is a very fine working colour, much used, and produces an excellent tint. It is to be bought with the other colours, but it may be made by holding a plate over the flame of a candle, then mixing up with gum-water the black flakes which have accumulated on the under surface of the plate. A mixture of madder brown and indigo will also form a good substitute for lamp-black.

* This is not required in coloured drawings: in that case it may be rubbed on an earthenware slab, if Indian ink be used. But few landscape-painters ever use it in their coloured or more finished drawings; they generally compound colours for their shadows.

† The pencils most commonly used in making water-colour drawings are called camel-hair pencils; but there are dark brown and yellowish red pencils, called sable pencils, which are the best and most elastic.

‡ For the different kinds of shades on mouldings, see page 82.

ON LANDSCAPE-DRAWING.

LANDSCAPE-DRAWING is the art of representing on paper or other surfaces those pleasing and striking effects which nature exhibits at certain seasons and under peculiar circumstances. Its excellence depends on a right combination of objects and of tints, suitable to the character of the scenery, the time of the day, or the season of the year. The following observations will be found useful to the student.

A cottage scene should have rustic accompaniments. The building may be covered, for instance, with ivy, Virginia creepers, honey-suckles, or jessamines; while hollyhocks and pots of flowers may be tastefully arranged in different parts of the landscape, and carefully and delicately worked up with a mixture of vivid and rich colours, calculated to produce a pleasing and picturesque effect. Temples and ancient edifices should, on the contrary, be drawn with dark and fuscous colours, such as we usually see at twilight; and the secondary objects may be pilgrims, or priests performing their sacred functions; thus stamping on the general scene a character of awe and sublimity. Where the composition is intended to convey an air of grandeur, much attention must be paid to the form of the secondary objects, their appropriate grouping, their connection with the principal object in the landscape, and the deep and impressive tone of the colouring. Lofty and obscure objects, as abbeys, pyramids, priories, feudal castles, and mountainous scenery, are best calculated to inspire and convey sublime emotions, especially when accompanied by dark, gloomy clouds, storms, lightning, and broad masses of shade thrown over the picture.

The student should never forget the principal object in his picture: on this the brightest light must be thrown; every other object should be kept in due subordination to it, yet intimately connected with it, and increasing its effect. The outer edges of the foliage of trees should be lightly coloured, and all lights in a picture should be composed of warm tints, except those on polished or reflecting surfaces, as metals, glass, water, laurel-leaves, &c. which should be cool, with bright and sparkling reflections. If the principal part of a landscape be composed of warm and glowing tints, such as sunshine after a shower, the sky must be serenely coloured, to accord with the landscape. If a strong light be required, it is best obtained by opposing to it a dark shade. When the general character of the landscape appears deficient in interest, the sky must be grand and imposing, and *vice versa*. Water, being pellucid, will usually derive its colour from the reflection of neighbouring objects, as trees, buildings, clouds, the sky, &c.; but this can only take place in calm and still scenes. When the water is agitated, surrounding objects are no longer reflected; it can then only be represented by waves, more or less swelling or broken, according to the effect intended to be produced. The water of the sea appears green, but the cause of this is not perfectly understood. Sometimes a yellow or dark tinge is given to pieces of water in a landscape. This either expresses that it is naturally or accidentally turbid, or that it is extremely shallow, and reflects the colour of the gravel or weeds at the bottom. Glass has likewise no colour, and can only be exhibited by reflection. If, standing in the open air, we look directly towards a window, it appears extremely dark, and would be represented by a mixture of lamp-black and indigo. This arises partly from the reflection of the external light, and partly from the few rays which are transmitted from the comparatively dark room within. If we look obliquely on the window, a

strong sparkling reflection of the clouds will be observed on the glass; if, standing in a room, we look towards the sky, the glass entirely disappears. The reflection of the setting sun on the windows of houses, when some of them are supposed to be partly open and the others closed, has a truly picturesque and beautiful effect*.

In mountainous scenery, more attention must be paid to the general form of the mountains than to the detail, because the numerous little intermediate ridges or eminences will not catch the eye so readily as the grand outline contrasted with the sky. Objects on the fore-ground of a landscape, and exposed to a strong light, require a more accurate and higher finish, and a greater warmth of colouring, than those which are more distant, or enveloped in shade. All light aërial tints laid on the remote distance of a picture should, as they approach the fore-ground, gradually brighten into more decided and rich tones of colour, the same atmosphere being carefully preserved throughout. Distant mountains should have the appearance of solidity as well as haziness. It is easy to give them distance, but to give them solidity at a distance is an excellence in the art.

When weeds, as docks, thistles, fox-glove, &c. are represented in the fore-ground of a landscape, and where great minuteness and accuracy are required, they should be carefully copied from nature, as should the appearance of moss, and the different lichens on the bark of trees. Sir Joshua Reynolds well observes, that "the effect of every object that meets a painter's eye may give him a lesson."

Dr. Syntax, in his "Search of the Picturesque," has given the following lines:—

> "He who from nature takes a view,
> Must copy, and improve it too:
> He ne'er will as an artist shine,
> Who copies nature line by line."

This must be carefully understood as alluding to the practised and finished artist, and not to the student. In drawing from nature, both the outlines and the colours should be strictly and religiously delineated. Were the student to allow himself the minutest licence, he would frequently be at a loss to distinguish between the actual representation of nature, and the pleasing or absurd creations of fancy. When, at a future time, he selects from these studies materials for some laboured composition, he may add or retrench as he thinks proper, but always remembering to introduce no unnatural or incongruous objects, and chusing the beauties and not the deformities of nature.

ON EFFECT IN LANDSCAPE.

Effect is best studied in sepia or Indian ink†. Sometimes a small coloured sketch is previously made for the effect by the most eminent painters; they are thus enabled to proceed in the principal work with greater ease and confidence. The student should first consider the time of the day and the season of the year, that he may properly arrange and modify his lights, shadows, and tones of colouring. The following observations will probably be useful to him.

* If a rainbow is represented in a picture, it is always seen opposite the sun, and to us is apparently elliptical; because the centre of the rainbow is opposite the centre of the sun.

† Rembrandt's pictures have the greatest effect of light and shadow of all the old masters. The reason of this is, that he generally has more shadow than light, and that shadow dark and impressive.

The morning light is a silvery grey; the light of the evening has a golden hue; but neither of them possesses the dazzling effulgence which is seen at noon-day. We naturally look towards the rising or setting, and turn from the noon-day sun. The objects which are exposed between us and the horizon, or against a strong light, have the sides towards us involved in deep shadow, with a bright light on the edges of those whose outlines are rounded. Were they to be represented with a vivid light thrown on them, it would not only be unnatural, but would destroy the effect of the glowing tints of the horizon behind. If we turn from the sun, the case will be reversed; the sky will appear darkest in the remote distance, and the intervening objects will be illumined by the rays of the sun falling directly upon them*. In representing mid-day or broad sunshine, those parts of the landscape which receive the full light will admit of all the rich harmonious colouring of nature in her noon-tide radiance.

Morning effect depends chiefly on sparkling or catching lights seen on the dew-drops bending the grass or hanging from the boughs of trees, and mists slowly rising between the hills. The principal figures may be peasants going to market, or rustics to their labour. In evening effects a pleasing stillness must pervade the scene. The figures must be few: "the ploughman homeward plods his weary way," the shepherd returns from his tinkling fold, or "the lowing herds wind slowly o'er the lea," while their shadows are lengthening on the ground. Hay-fields, or corn-fields, are proper for mid-day effects. A river scene has often a beautiful effect: the cattle are crowded together in the river, with their shadows almost immediately under them, as if from a sun nearly vertical; while the herdsman is stretched at his full length under some shady tree, and his faithful dog slumbers at his side.

PREPARATION AND LAYING ON TINTS.

The outline being correctly drawn, and his paper stretched on a frame, being likewise provided with sable or camel-hair pencils, sepia, and saucers containing the different tints, the student will place himself sideways to the light, having the window at his left hand, and his drawing-board immediately before him, and considerably sloped; the tints will thus readily follow the brush, and be free from breaks and inequalities. He should first work in the sky†, wherever it is intended to be blue or azure; but let him never retrace the parts which are dry, nor draw his brush backward and forward in a diffident manner, as if he were working without any decided plan. If the outline be correct, the colour may be laid freely on. Then let him work up the clouds so as to produce the desired effect, always remembering to lay on his colours while his paper is damp. He may now proceed with the landscape, laying in all the shadows or masses of shade, keeping his brush full of colour that it may readily flow, beginning with the remote distance, and gradually approaching the fore-ground. Let the shadows be worked up as nearly as possible to their full effect before he goes on. Let him now take a tint somewhat fainter than each of the shadows, and lay it over the corresponding light parts of the composition, and by going some way over the outlines of the shadows, the tints will be

* In the works of many artists, the horizon is coloured as warm as if the sun were either rising or setting, while a glare of light is thrown on the different objects, which could only be found when that luminary is 50 or 60 degrees above the horizon. This produces a false and absurd effect.

† If the drawing be very large, the paper should be damped, and the water nearly evaporated before the sky is coloured. The pannel at the back may likewise be taken out, and the paper damped on that side; it will thus be kept constantly down.

blended together*, and the whole drawing will have a natural and pleasing appearance. Lastly, with some darker tint let him strengthen and give depth to the shadowed parts of the objects in the fore-ground, avoiding the light parts of the picture.

THE PRACTICE OF COLOURING.

THE student being supposed to be sufficiently grounded in the theory and practice of perspective-drawing and shadowing, we proceed to give some rules for colouring landscapes. I cannot, however, refrain from observing, that if he be not a proficient in the former, he will derive little advantage from the latter. An eminent writer makes the following very important observation:—"If a picture be ill drawn, let it be ever so well coloured, it will not be held in such high esteem by good judges as another coloured with inferior skill, but drawn according to the laws of perspective and the principles of anatomy: for though men by nature are formed of various colours and complexions, yet she never operates in their motions contrary to the mechanical principles of anatomy, nor does she exhibit those motions to the eye against the geometrical laws of perspective†."

The student should be particularly careful to adapt his tints to the nature of his composition and the intended effect of his piece. In few things will his judgment be more evident than in the appropriation and choice of colours. The colours should be diversified, as far as is consistent with the nature and harmony of the composition, carefully avoiding glare and discord. The tints should at once be laid on clear and decided, so that every object may if possible receive its proper tone with the first brush of the pencil. Plate XXXIX. is a fac-simile of a drawing of the Temple of Concord, with appropriate scenery, to elucidate the theory and practice of colouring; and to this I refer the student.

The pupil will first wash in the sky; for this he will use a mixture of Prussian blue, with a little lake, to take off the greenness which pervades the blue. Then work up the clouds into proper effect with a mixture of indigo, Indian red, and a little Roman ochre. Afterwards, with a mixture of light red and yellow ochre, give warmth to the edges of the clouds, carrying the colour a little way into the body of the clouds. The clear sky should now again be retouched, beginning close to the light edges of the clouds, and softening it gradually off towards the horizon, and to the sun, or where the light is supposed to enter the picture. The whole being dry, the sky should be lightly washed with a brush, to give it distance and softness.

The towers of the Abbey, seen to the right of the temple, are coloured with a mixture of indigo, lake, and lamp-black. The distant trees are worked up with a grey tone of colour, compounded of indigo, sepia, and lake. The Palace, to the left of the temple, is coloured with light red and lamp-black. The grass is indigo, burnt sienna, and brown pink. The nearer trees, burnt umber and indigo, and some of them burnt sienna and indigo. The trunks of the trees are lamp-black and burnt sienna, and the water under them indigo and lamp-black. The bank in the fore-ground is shadowed with Vandyke brown and lamp-black, prior to the grass colour

* For buildings, such as old cottages, &c. which are much diversified by weather-stains, it is best to use two brushes, one containing a compound colour of indigo and light red, the other light red and Roman ochre, laying them on alternately joining each other, by which means the colours will soften and unite, and produce a most pleasing variety. The student should likewise be careful to bring the light the same way upon the clouds and the different objects of the landscape.

† Count Algarotti's Letters.

being laid on. The lights on the trees in the fore-ground, and some parts of the grass, are glazed over with a mixture of burnt sienna, lake, and Italian pink, and this tint extends a little way over the shadowy parts. The figures and the temple are coloured as may be required, carefully avoiding discord. In this way every landscape may be executed.

VARIOUS METHODS PRACTISED IN LANDSCAPE-DRAWING.

Mr. Gandy, a very excellent colourist, after he has strained his paper upon the drawing-board, washes it well with a wet sponge, until he brings up the whole knap of the paper; and he supposes that the colours are brighter and work more pleasantly in proportion as he gets rid of the size of the paper. This is likewise practised by Mr. Varley and some other eminent artists.

A drawing is sometimes worked up in light and shadow, and a general indication of colour is given for effect; the whole is then well washed with a wet sponge, and reworked. The colouring is thus rendered aërial, bright, and natural. When evening or morning effects are intended to be produced, a very light tint, composed of light red and yellow ochre, or lake and gamboge, is uniformly washed over the drawing, previous to the general colouring, as well as the sky being graduated into warm colours as it approaches the horizon. A tint, composed of light red and indigo, is sometimes carried over the landscape before the grass colour is laid on; this gives an earthy appearance through the grass. The light touches on the trees in the fore-ground of a picture, are executed by some artists in the following manner:—When the tree has a body of colour on it, take a damp hair-pencil, and lightly touch the tree in the various places at which the lights are wanted; then gently rub the places with a white handkerchief, which will take up the colours; the light parts may then be filled up with rich warm tints. This is an excellent method for the bloom on elder, and broad leaves on the surface of water or in the fore-ground of a landscape. Smoke undulating over a wood may be expressed by taking up the colour of the trees with a brush or sponge while wet. The rays of the sun may be represented in the same manner, or better perhaps by the following method:—When the drawing is finished, take a slip of paper with a perfectly straight edge, lay it on the drawing in the direction of the required ray, and rub gently with a piece of India rubber along the edge of the paper and on the colour: on removing the paper the ray will be clearly and pleasingly delineated. Smoke may be thus represented after the drawing is coloured:—Take a damp brush and lay it for a minute over the colour, then rub the place with soft bread, and the colour will be taken up. Lines in architectural subjects are best removed by the use of soft bread; the paper receives the colour better after the use of the bread than of India rubber.

The bars of the windows often give the student much trouble. He will best preserve them in the following manner:—After they have been penciled, take the white of an egg and beat it up to the usual consistency of diluted colours, and with a sable-brush or pen trace over the bars; then lay on the glass colour. If this be rubbed with soft bread when perfectly dry, the colour will be removed from the bars, and the glass will remain. A body colour composed of whiting and gum-water may likewise be used for the bars. It is become a frequent practice to use body colours in water-colour drawings, where a depth of colour is required in the fore-ground, or where peculiar strength of effect is intended. This is done with the common colours rubbed with strong gum-water. King's yellow is excellent for the hands of a clock, &c.

The Greys which may be compounded for Mountains or Clouds, are as follow:—

Indigo and Indian red;—indigo, lamp-black, and madder lake;—indigo and light red;—lamp-black and madder lake;—indigo, lake, and gamboge;—indigo, lake, and Roman ochre;—indigo and Venetian red;—indigo and madder purple;—indigo, light red, and lamp-black;—madder brown and lamp-black;—indigo, burnt umber, and lake;—lamp-black and light red;—lamp-black and lake;—indigo, madder purple, and burnt sienna;—indigo and coal;—indigo, sepia, and lake;—indigo, raw terra di sienna, and lake.

The Greens which may be compounded for Trees and Grass, are as follow:—

Indigo, light red, and gamboge;—indigo, burnt sienna, and gamboge;—indigo, madder, purple, and brown pink;—indigo, burnt umber, and Italian pink;—indigo, Vandyke brown, and gamboge;—indigo, gamboge, and Roman ochre;—indigo, Vandyke brown, and yellow ochre;—indigo and raw terra di sienna;—indigo and Roman ochre;—indigo, lamp-black, and gamboge;—indigo and gamboge;—indigo, Vandyke brown, and gamboge;—indigo, madder brown, and Indian yellow;—indigo, gamboge, and raw terra di sienna;—indigo, lake, and gamboge.

Warm Tints for Grass, Trees, &c.

Burnt sienna and gamboge;—coal and Indian yellow;—Vandyke brown and gamboge.

The Browns which may be compounded for Buildings, Roads, Rocks, and Fore-grounds, are as follow:

Madder brown and lamp-black;—madder brown and coal;—indigo, lake, and yellow ochre;—gamboge, lake, and ink;—light red and lamp-black;—burnt sienna and lamp-black;—lake and lamp-black;—Vandyke brown and lamp-black;—burnt terra di sienna and coal;—Vandyke brown and terra di sienna;—coal and lamp-black;—Vandyke brown and lake. Burnt sienna alone is much used for gravel-walks to architectural subjects.

TO VARNISH DRAWINGS.

The drawing is thus put on the straining-frame previous to the varnishing:—Paste the back of your drawing, and let it lie a few minutes; then lay the pasted side on the canvas, and rub it down with a handkerchief. If it rises in the middle, raise one of the corners, and rub the paper gradually towards it; this will expel all the air. Then turn the straining-frame, and with a towel rub the whole surface of the canvas, which will bring the paste through and cause the paper to adhere more closely. The paper, when dry, must be well sponged, and after this will be ready for drawing. The outlines of architectural subjects may have been delineated on the paper previously to its being extended on the straining-frame.

The varnishing is thus conducted:—Take some isinglass, boil it to the consistence of new milk, and strain it through a piece of fine linen. When the isinglass is about as warm as new milk, take a flat brush, and beginning with the top of the drawing, lay the liquid regularly and slightly over it, proceeding as quickly as possible when you descend to the landscape, and especially when you pass over the fore-ground, otherwise the colours will wash up with the brush. When this is thoroughly dry, give it another layer in the same manner; but there will now be little danger of removing the colours. As soon as this is dry, get some white hart varnish (or a beginner will perhaps more easily manage copal varnish, because it does not so rapidly dry as the other, and is indeed nearly as good); warm the back of your drawing at the fire, pour your varnish into a cup, and proceed as with the isinglass. This will likewise require two layers. The white hart varnish will sometimes turn milky on the drawing; this may be removed at the time by holding the drawing near the fire, and turning it round to prevent the varnish from running on the surface. The drawing should always be laid level when each coat of varnish is put on, and the whole process should be conducted in a warm room.

THE END.

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